The Effects of Joining Multinational Supply Chains: New Evidence from Firm-to-Firm Linkages*

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We study the effects of becoming a supplier to multinational corporations (MNCs) using tax data tracking firm-to-firm transactions in Costa Rica. Event-study estimates reveal that domestic firms experience strong and persistent gains in performance after supplying to a first MNC buyer. Four years after, domestic firms employ 26% more workers and have a 4 to 9% higher total factor productivity (TFP). These effects are unlikely to be explained by demand effects or changes in tax compliance. Moreover, suppliers experience a large drop in their sales to all other buyers except the first MNC buyer in the year of the event, followed by a gradual recovery. The dynamics of adjustment in sales to others suggests that firms face short-run capacity constraints that relax over time. Four years later, the sales to others grow by 20%. Most of this growth comes from the acquisition of new buyers, which tend to be "better buyers" (e.g., larger and with more stable supplier relationships). Finally, we collected survey data from domestic firms and MNCs to provide further insights into the wide-ranging benefits of supplying to MNCs. According to our surveys, these benefits range from better managerial practices to a better reputation.

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1 Introduction

Governments around the world compete to attract foreign direct investment – typically in the form of affiliates of multinational corporations (MNCs) – through costly public programs such as tax holidays or subsidized industrial infrastructure.[1] The expectation of these governments is that MNCs not only are high performers themselves but also help improve the performance of domestic firms. This latter prospect is particularly appealing for developing countries, where most firms are small and low-performing (Tybout, 2000). While direct supply chain linkages are not the only channel through which MNCs may improve the performance of domestic firms, they are viewed as one of the most promising (Alfaro, 2017).

In this paper, we ask what are the effects of becoming a supplier to MNCs on domestic firms. A complete answer to this question has so far proven elusive for three related reasons. First, it has been exceedingly difficult to observe direct business linkages between domestic suppliers and MNCs in conventional data, especially for the entire economy. Past research has thus relied on sector (or sector-by-region) level variation in the degree of foreign ownership in downstream sectors. Second, firm supply linkages may be endogenous. Without observing actual linkages, it is difficult to tease out the direction of causality between supplying to MNCs and changes in firm performance. Third, the same inability to directly observe suppliers has limited previous research from painting a complete picture of the effects of interest.

To make progress on these three challenges, we bring together a rich collection of microdata from Costa Rica (henceforth, CR) that includes the near-universe of formal firm-to-firm transactions in the country.[2] This makes it possible to observe the actual linkages between MNCs and their domestic suppliers. Second, we adopt an event-study strategy to estimate the effects of starting to supply to MNCs. We also probe the robustness of our baseline estimates to four alternative control groups. Third, we provide a detailed account of the changes faced by first-time suppliers to MNCs (shortened to "first-time suppliers" hereafter). We begin with standard measures of firm performance such as firm size or total factor productivity (TFP). We then leverage the firm-to-firm transaction data to document the adjustments in business with others. We uncover changes in the average sales per buyer, the number of other buyers, and other buyers' characteristics. We show that mere demand effects or changes in tax compliance are unlikely to explain our findings. Finally, for a more nuanced interpretation of our results, we conduct a survey of managers in a representative sample of domestic firms and MNCs.

The analysis proceeds in four steps. In the first step, we introduce the new database that we have assembled and the context. Most of our progress relies on the firm-to-firm transaction data collected by the Ministry of Finance since 2008. We match this data with corporate income tax data and foreign ownership data, among others. We can then identify MNCs and

[1] The competition in investment incentives for MNCs is so high that governments are adopting ever more sophisticated approaches such as special tax incentives focused on intangible assets (UNCTAD, 2018a). Moreover, the number of Special Economic Zones – the mainstay of investment promotion and facilitation policies – rose from 76 in 1986 (spread across 47 countries) to over 4,500 in 2018 (spread widely across the world) (UNCTAD, 2018b).

[2] The data cover all formal firm-to-firm transactions that in a year amount to more than 4,200 U.S. dollars. During our study period (2008–2017), this data was collected for general sales tax and corporate income tax enforcement.

domestic firms in buyer-supplier relationships and characterize these firms and relationships. In addition to this data advantage, ever since Intel's entry in 1997, CR has attracted a large and diverse set of MNCs. We exploit this feature in the heterogeneity analysis.

Our event of interest is the first time a domestic firm sells to an MNC in CR. We focus on events occurring between 2010 and 2015, for which we observe the transition of domestic firms into their new role as suppliers of MNCs. During this period, 3,697 domestic firms start supplying to one of 444 MNCs. On average, first-time suppliers employ 16.9 workers in the years before their event. MNCs are notably larger, averaging 481 workers between 2008 and 2017. Both sets of firms span a wide range of economic activities, though domestic suppliers are more likely to be found in services and MNCs in manufacturing. The first relationships with an MNC are plausibly consequential, as the average amount first sold to an MNC is 62,400 U.S. dollars and represents 19% of all sales that year.

In the second step, we introduce our baseline event-study design to estimate the effects of starting to supply to MNCs. The baseline sample includes both domestic firms that supply for the first time to an MNC in CR sometime between 2010 and 2015, and domestic firms that never supply to an MNC between 2008 and 2017 (henceforth referred to as "never-suppliers"). The identification assumption underlying this research design is that firms yet to supply to MNCs together with firms that started to supply MNCs in earlier periods form a credible counterfactual for first-time suppliers to MNCs, after we account for time-invariant differences between firms and shocks common to firms in the same four-digit sector and province. As we can estimate event-study coefficients for four years before an event, this method allows us to transparently show that first-time suppliers do not exhibit pre-trends in observables.

We first show that first-time suppliers experience strong and persistent improvements in firm size. Four years after their first sale to an MNC buyer, firms have 33% higher sales, 26% more employees, 22% more net assets, and 23% higher total input costs (all relative to the year before the event). We then examine various measures of TFP, ranging from the residual of OLS estimates of a Cobb–Douglas production function to an adapted version of the De Loecker (2013) estimation procedure (which accommodates endogenous productivity processes such as learning by supplying to MNCs). After their event, domestic firms experience sizable and lasting gains in TFP, such that their TFP is 4 to 9% higher four years after. Finally, while our TFP estimates may in part reflect markups, we provide evidence that strongly suggests that at least part of the estimated TFP effects capture an actual increase in productivity and quality.

Next, with the aid of the firm-to-firm transaction data, we explore the business patterns of first-time suppliers with all their other buyers (all *except* the first MNC buyer). In the year of the event, the sales to others decrease by 19%; of these sales, those made to other corporate buyers (those buyers whose purchases must be reported in the firm-to-firm transaction forms) decrease by 75%. In time, however, the business with other buyers flourishes. Four years after starting to supply to MNCs, sales to (corporate) buyers other than the first MNC buyer increase by 20% (45%), the number of corporate buyers rises by 31%, and the average sales per buyer increase by 14%.

Because we have merged the firm-to-firm transaction data with several other firm-level datasets, we can identify the buyers whose purchases have been most affected by the event. We first show that after the event, first-time suppliers to an MNC churn their old buyers more than never-suppliers that are randomly assigned a fake event year. While most of their new buyers are domestic, first-time suppliers also manage to secure new MNC buyers (other than their first MNC buyer). Four years after the event, first-time suppliers sell to 1.2 new MNC buyers. On average, the new buyers of first-time suppliers are "better buyers," in the sense of being larger, more engaged in international trade, and having more stable supplier relations.

Our baseline results survive four alternative strategies that use different control groups for first-time suppliers. The first is an event-study design that leverages the rules of "Productive Linkages," a program that mediates linkages between MNCs and domestic suppliers. Procomer (the government agency implementing this program) assesses the ability of domestic firms to supply to MNCs and assigns them scores. Based on these scores, Procomer proposes to MNCs shortlists of comparable contenders. These shortlists create the opportunity for a "winner vs. losers" design. One concern of the "Productive Linkages" exercise is its sample size. We overcome this concern via three matching techniques applied to the baseline sample of economy-wide first-time linkages to an MNC: matching based on predicted Procomer scores, propensity score matching, and nearest-neighbor matching. These matching techniques share with "Productive Linkages" the benefit of generating contenders to each MNC deal. Reassuringly, all four alternative strategies deliver results consistent with our baseline results.

A lingering concern for identification is that firms may receive unobservable firm-specific shocks that affect both the timing of their first supplying relationship with an MNC and their subsequent performance. To alleviate this concern, we show that our results are robust to excluding firms that had recently hired either a new manager (regardless of her previous employment), a former worker for an MNC, or a supplier to an MNC (irrespective of her new position). Finally, our results are robust to keeping only never-suppliers to MNCs that are nevertheless suppliers to a large domestic firm, dropping all never-suppliers to MNCs, varying the fixed effects, and balancing the sample of first-time suppliers around the event year.

In the third step, we use the administrative data to further inform our interpretation of the baseline results. We first show that the long-term effects of "placebo" demand shocks (from the government, a large domestic buyer, or a domestic exporter) diverge decisively from those of demand shocks from an MNC. Second, the short-term fall in sales to others (which affects both first-time suppliers to MNCs and suppliers to other placebo buyers) suggests that domestic firms face steep short-run marginal cost curves – most likely due to capacity constraints or inflexible inputs. Third, we provide evidence that our results are unlikely to be explained by changes in tax reporting after the first linkage with an MNC. Lastly, we show that, on average, domestic firms in manufacturing, who supply a core input to the MNC and/or have a stronger first interaction with the MNC, are those who gain most from their event. Moreover, it is most useful to supply MNCs in manufacturing and services, smaller MNC affiliates, and/or MNCs whose HQ country has a higher GDP per capita and better management practices.

In the fourth and final step, we rely on surveys we conducted on a representative sample of MNCs and domestic suppliers. Both types of firms recognize how consequential it is for a domestic firm to start supplying to MNCs. After becoming suppliers to MNCs, most firms undergo a series of interrelated changes, which include better managerial and organizational practices, expansions in product scope with higher-quality products, and improved reputation. These changes arise from interactions during which MNCs communicate expectations and advice, and from the effort exerted by new suppliers to deliver on their contracts. Overall, these insights match the story painted by the main results from the administrative data.

Our work is related to several literatures. At its core, this article contributes to an extensive literature studying interventions aimed at improving firm performance in developing countries. Woodruff (2018) notes that most of this literature focuses on interventions that alleviate supply-side constraints (e.g., programs granting access to credit or training). Despite the popularity of such interventions, literature reviews suggest that the evidence is mixed as to whether they can actually alter the long-term growth of firms.[3] While notably scarcer, there is increasing evidence that demand is an important determinant of (small) firm dynamics. In particular, improving access to foreign buyers – through trade[4] or foreign direct investment (FDI) – is believed to hold great promise for firms in developing countries. The expectation is that beyond increasing demand, foreign buyers provide valuable learning opportunities.

By studying the effects of selling to foreign buyers, this paper relates to a voluminous literature on learning-from-exporting.[5] In contrast to standard trade, global value chains or GVCs (joined upon starting to supply to an MNC) typically involve longer-term firm-to-firm relationships. "This relational nature of GVCs makes them a particularly powerful vehicle for technology transfer along the value chain. Firms have a shared interest in specializing in specific tasks, exchanging technology, and learning from each other" (World Bank, 2020). This stronger alignment in incentives between buyers and suppliers, together with the increasing prevalence of GVCs, makes studying the effects of joining a GVC intrinsically interesting. Moreover, several other reasons justify this separate study. One such reason is the proximity between buyers and suppliers, which is likely to facilitate learning. Another is that exporting is only possible for firms selling tradables and competitive enough to overcome trade costs. Also, MNCs are plausibly more sophisticated buyers than the modal importer (Bernard et al., 2012). Finally, countries devise generous tax breaks to explicitly attract MNC affiliates. Estimating their effects on local firms is directly valuable for policy-makers, who can then compare these estimates with those for alternative policies (e.g., export promotion).

By studying the effects of supplying to domestic affiliates of MNCs, this paper is also closely related to a vast literature on the effects of FDI on firm performance.[6] Papers on this topic generally combine firm-level panel data with sector-level input-output (I-O) tables and

[3]For reviews on this strand of the literature, see Banerjee (2013) and McKenzie and Woodruff (2013).
[4]De Loecker and Goldberg (2014) reviews the literature linking trade exposure to firm performance.
[5]Atkin et al. (2017) provides causal evidence of learning-from-exporting for a sample of rug producers in Egypt.
[6]For classic papers in the FDI literature, see Haddad and Harrison (1993); Aitken and Harrison (1999); Javorcik (2004); Alfaro et al. (2004); Haskel et al. (2007); Keller and Yeaple (2009). Contemporaneous papers on the wider effects of FDI include Abebe et al. (2020), Alfaro-Ureña et al. (2019) and Méndez-Chacón and Van Patten (2020).

find that an increase in FDI at the sector (or sector-by-region) level is associated with increases in standard measures of TFP of (nearby) domestic firms in upstream sectors (commonly referred to as spillovers from backward linkages). Moving from variation in sector-level proxies for exposure to FDI to variation in the actual linkage status of a firm presents new opportunities for precision and insight into the effects of joining MNC supply chains.[7]

Finally, this paper also relates to empirical work made possible by the recent availability of domestic firm-to-firm transaction data.[8] We study in detail the effects of establishing a first linkage with an MNC buyer. Four years after this first linkage, domestic firms substantially improve their sales to other buyers. Two-thirds of this improvement comes from the acquisition of new buyers. This echoes the finding that the number of buyers explains the majority of firm size heterogeneity (Bernard et al., 2020). Moreover, we use the firm-to-firm transaction data in three novel ways. First, we show that first-time suppliers to MNCs not only acquire new buyers, but they acquire buyers that are better-performing (e.g., larger and with longer supplier relationships). Second, we compare the medium-run effects of demand shocks from MNCs against those from three types of placebo buyers (the government, large domestic firms, and domestic exporters) and highlight the unique nature of MNCs as buyers. Third, we contrast the dynamics of adjustment for first-time suppliers to MNCs with that of suppliers to these placebo buyers. We bring evidence consistent with suppliers (to both MNCs and placebo buyers) having steep short-run marginal cost curves that flatten over time.[9]

This paper proceeds as follows. Section 2 describes the data and context. Section 3 introduces our baseline event-study strategy and four alternative strategies. Section 4.1 presents our baseline results and Section 4.2 probes their robustness. Section 5 provides additional evidence from the administrative data to guide interpretation. Section 6 draws on surveys for more insights into the drivers of improvements in firm performance. Section 7 concludes.

2 Data and Description of Supplying Linkages

2.1 Data

Economy-wide administrative data. The main dataset tracks the near-universe of formal firm-to-firm relationships in CR between 2008 and 2017. This information is collected by the Ministry of Finance of CR through the D-151 tax form. Firms must report the tax identifier (ID) of all their suppliers and buyers with whom they generate at least 2.5 million Costa Rican

[7] Using our firm-to-firm transaction data, we find that sector-level backward linkages predict less than 1% of the actual firm-level linkages with MNCs. This may explain why estimates of spillovers from backward linkages vary broadly across studies, from strongly positive to negative (Havránek and Iršová, 2011). Table E1 (Online Appendix E.1) reports the TFP estimates for CR using sector-level and firm-level measures of backward linkages (echoing the methodology of the previous FDI spillovers literature). We find that the standard measure of backward linkages is only significant when based on actual firm-level linkages but not on the sector-level ones.

[8] See, for example, Huneeus (2018), Brugues (2020), and Dhyne et al. (2020).

[9] This insight resembles those of other papers that explain the interdependence of firm-level sales across markets through increasing marginal costs (Almunia et al., 2020; Sun and Zhang, 2018; Ahn and McQuoid, 2017). We take advantage of the staggered timing of the event to estimate the marginal-cost elasticity at different time horizons.

colones (around 4,200 U.S. dollars) in transactions that year, in addition to the total amount transacted. This declaration is compulsory not only to private businesses but to all actors in the economy (e.g., individuals providing professional services, public entities, etc.). Thanks to the third-party reporting nature of the D-151 form, this data plays a crucial role in the enforcement of the general sales tax and corporate income tax.

We merge the firm-to-firm transaction data with the yearly corporate income tax returns from the Ministry of Finance for the same 2008 to 2017 time period. These returns cover the universe of formal firms in the country and contain typical balance sheet variables (e.g., total sales, net assets, input costs, etc.). We then add matched employer-employee data from the Costa Rican Social Security Fund, which tracks the labor earnings and occupations of all workers engaged in formal employment.[10] In some robustness checks, we also bring in data on firm-level imports and exports from Costa Rican customs declarations.

Additionally, we construct a comprehensive dataset on the foreign ownership of firms by cross-checking information from six different sources. The first three are annual surveys conducted by BCCR and inquiring on the foreign ownership of firms. These surveys tend to oversample large firms. The fourth source is the reporting of firms that are active under the Free Trade Zone regime. The fifth source is the organization responsible for drawing FDI to CR (CINDE), which provides information on the foreign ownership of firms they attracted. Finally, we bring in Orbis data, which has a high coverage of firms in CR and allows us to confirm which foreign firms in the country are part of an MNC group.

A last step in building the final administrative dataset is to assign tax IDs to firm groups and properly turn tax ID-level information into group-level information.[11] Online Appendix A.1 discusses how we approach this step, in addition to providing more details on data construction and summary statistics for the administrative datasets mentioned above.

"Productive Linkages" data. Since 2001, Procomer (CR's trade promotion agency) has implemented a matchmaking program called "Productive Linkages." The program aims to insert local firms into export supply chains, where the exporter is usually an MNC affiliate. Procomer has built a comprehensive database of local firms that are suitable and willing to supply to MNCs. Procomer staff visit firms and evaluate them on criteria that are typically unobservable in tax records but are nonetheless relevant to MNCs. Each firm is then assigned an overall score. When an MNC approaches Procomer with an input need, Procomer identifies the suppliers that can produce that input, ranks them based on their score, and shares with the MNC a shortlist of the highest-ranked suppliers. Online Appendix A.2 describes the Procomer data.

We leverage the Procomer data in two ways. First, while the program was not designed as an experiment, by applying sensible restrictions to the universe of deals mediated by Procomer, we can retrieve a subset with a quasi-experimental setup. Specifically, we study the 31

[10] Informal workers represent 27.4% of all workers in CR. While sizable, this share is smaller than the 53.1% average for Latin America (ILO, 2018). Section 5.3 and Online Appendix A.1.4 address the issue of informality.

[11] A firm can split its reporting across several tax IDs (e.g., by assigning all workers to one tax ID and all sales to another). If they share ownership and make decisions as a unit, tax IDs should not be treated as independent firms but should be aggregated into firm groups. Throughout the paper we use *firms* to refer to *firm groups*.

deals (i) that are first-time deals with an MNC for one of 31 domestic firms, (ii) that occur in our sample period (namely, between 2009 to 2015), and (iii) where all 84 contenders had not yet supplied to an MNC before the deal for which they were shortlisted. Second, we use the universe of Procomer scores to learn about their predictors from the administrative data. We then generate predicted Procomer scores for all firm-years in our economy-wide sample and apply a matching technique based on similarity in predicted Procomer scores.

Survey data. In 2018, we conducted surveys of both MNCs and their domestic suppliers. Our main objective was to shed light on typically unobservable aspects of relationships between the two types of firms. The surveys were administered in two versions: a longer field survey conducted at the main location of the firm and a shorter web-based one. Core questions were mirrored between surveys to both domestic firms and MNCs. Given the retrospective nature of some of the topics covered, the ideal respondent was the founder of the domestic firm and the supply chain manager of the MNC. The need to reach specific employees compounded the already difficult task of establishing a first contact with these firms.

We gathered responses from a total of 164 firms, of which 38 were surveyed in person and 126 online. 106 respondents are domestic suppliers to MNCs and 58 are MNCs based in CR. Combined, the 164 responses from buyers and sellers cover at least one side of the buyer-seller pair for about 20% of the pairs of interest. Comparing the firms with and without a response suggests that a response bias is unlikely. See Online Appendix F for more details.

2.2 Description of MNCs, Domestic Suppliers, and Their First Linkage

MNCs in CR. We start from the 2,156 firms in CR that belong to corporate groups where at least one firm is partially foreign-owned.[12] From this set of firms, we create three mutually exclusive subsets: firms that are fully domestically-owned (despite being part of a corporate group where another firm is partially foreign-owned), firms that are themselves at least partially foreign-owned but whose median employment across all years of activity in the country is under 100, and firms that are themselves at least partially foreign-owned and whose median employment is over 100. We study the 622 firms in the third category.[13]

All the 622 firms we focus on are MNC affiliates, with known global ultimate ownership and a substantial affiliate presence in CR. We use the customary definition of an MNC, as "an enterprise that controls and manages production establishments/plants located in at least two countries" (see Antràs and Yeaple, 2014). Our size threshold also enables us to circumvent issues related to FDI statistics, such as the rising use of shell companies. These 622 firms employ 76% of the workers and export 91% of the totals across firms in the three categories

[12] A corporate group is a set of firms that share ownership, but do not necessarily behave as one business. For instance, some firms in the same corporate group may operate in different economic sectors.

[13] The typical foreign-owned firm in the second category is not an MNC affiliate but a single location firm that serves local demand, either in service sectors (e.g., hotels) or sectors with low local input requirements (e.g., import/export retail or real estate agencies). While our baseline results pertain to the 100-worker size restriction for foreign-owned firms, we show in Online Appendix D.4 that results are robust to removing it and including firms in the second category as well.

combined (see Online Appendix A.1.3).

From the universe of firm-to-firm transactions in CR, we learn that between 2010 and 2015, 444 of these 622 MNCs became the first MNC buyer from one of 3,697 domestic firms. 46% of the 444 MNCs are from the United States, with the other 54% coming mainly from either Latin America or Western Europe. While manufacturing is the most frequent sector (covering 38% of the 444 MNCs), the remaining 62% of MNCs fall into sectors as diverse as retail, agriculture, and information and communication. For more detailed summary statistics on these MNCs, see Tables B1 and B2 in Online Appendix B.

Domestic suppliers to MNCs. Among all the domestic firms in CR, we restrict our attention to those with at least a median of three workers and median yearly revenues of 50,000 U.S. dollars (CPI-deflated to 2013 dollars) across all years of activity. We remove firms that are state-owned, registered as households, NGOs, or part of the financial, construction, and education sectors.[14] This leaves us with 24,370 firms. Of these firms, we use the firm-to-firm transaction data between 2008 and 2017 to identify and keep only two types of firms: the 3,697 firms that become first-time suppliers to an MNC sometime between 2010 and 2015,[15] and the 14,338 firms never supplying to an MNC between 2008 and 2017. Our interest lies in the firms in the first category, but we also use firms in the second category to construct counterfactuals.

For the 3,697 first-time suppliers to an MNC, the average number of workers in the years before the event is 16.9. Around 11% of these firms operate in manufacturing, while around 32% work in wholesale and retail trade (including repair and maintenance). Among the service sectors, the most common sectors are professional, scientific and technical services (14%), administrative and support services (10%), transportation and storage (9%), and accommodation and food services (6%). For more summary statistics on the first-time suppliers (e.g., on their productivity, trade activity, age, number of buyers) see Table B3 in Online Appendix B.

Relationships between MNCs and their domestic suppliers. In CR, MNCs and domestic firms can establish a buyer-seller relationship either independently, unmediated by any government institution, or mediated by Procomer through the "Productive Linkages" program. The aim of programs such as "Productive Linkages" is not to replace unmediated market-based linkages between MNCs and domestic suppliers with linkages mediated by the program, but to create additional opportunities for linkages (e.g., by lowering informational barriers on the capabilities of domestic suppliers). This program mediates only 1% of both the number and value of linkages between MNCs and domestic suppliers occurring economy-wide in CR. For this reason, we prioritize the analysis of unmediated relationships.

As mentioned above, we find 3,697 domestic firms that supply to an MNC for the first

[14] While we justify these restrictions in Online Appendix A.1, our baseline results are robust to discarding them (see discussion in Section 4.2.2 and corresponding tables in Online Appendix D.4).

[15] We start in 2010 to ensure we measure correctly the first year when a firm supplies an MNC. After 2015, we are no longer able to observe at least two years after each first-time linkage. Also, there are 3,813 domestic firms that became first-time suppliers to 471 MNCs. However, in the main event-study regression (1) studying the impact on total sales, only 3,697 of these domestic firms are used in the estimation, with the rest being dropped due to the fine set of fixed effects used. For consistency, we present summary statistics only for those 3,697 firms and their associated 444 first MNC buyers.

time sometime between 2010 and 2015, and do so in an unmediated fashion. We refer to these first-time supplying instances as (unmediated economy-wide) events. Across these events, the average amount first sold to an MNC is 62,400 U.S. dollars and represents 19% of all sales that year. While the average relationship of first-time suppliers lasts 1.99 years, the relationship with the first MNC buyer lasts on average 2.77 years. This suggests that the relationship with the first MNC buyer is plausibly consequential for the supplier. For more summary statistics on the events, see Tables B4 and B5 in Online Appendix B.

3 Empirical Strategy

3.1 Baseline Empirical Strategy: Economy-Wide Event Studies

In what follows we present our baseline empirical strategy to study the effects of becoming a first-time supplier to an MNC in CR. Between 2010 and 2015, 3,697 such events occur across the Costa Rican economy. More specifically, we estimate the following event-study specification:

$$y_{it} = \alpha_i + \lambda_{spt} + \sum_{k=\underline{C}}^{\overline{C}} \theta_k D_{it}^k + \varepsilon_{it}, \tag{1}$$

where y_{it} is an outcome of firm i in calendar year t, α_i is a firm fixed effect, and λ_{spt} are four-digit sector $\times$ province $\times$ calendar year fixed effects. We define the event-time dummies as $D_{it}^k := \mathbb{1}[t = \tau_i + k]\ \forall k \in (\underline{C}, \overline{C})$, $D_{it}^{\overline{C}} = \mathbb{1}[t \geq \tau_i + \overline{C}]$, and $D_{it}^{\underline{C}} = \mathbb{1}[t \leq \tau_i + \underline{C}]$, where $\mathbb{1}[.]$ is the indicator function and τ_i is the first year when firm i sells to an MNC. ε_{it} is an error term. We normalize $\theta_{-1} = 0$ and set $\underline{C} = -5$ and $\overline{C} = +5$. We cluster standard errors at the two-digit sector $\times$ province level.

Our baseline economy-wide regressions use a sample that includes both domestic firms that become first-time suppliers to an MNC sometime between 2010 and 2015 and domestic firms that never supply to an MNC between 2008 and 2017. Identification of the event-study coefficients θ_k hinges on the assumption that firms yet to supply to MNCs and firms that started to supply in earlier years form a credible counterfactual for firms that start supplying to MNCs, after accounting for time-invariant differences between firms and common sector-by-province-by-year shocks.[16] The panel data allows us to consistently estimate treatment effects without assuming treatment exogeneity and without an instrumental variable, provided that the treatment varies over time and is uncorrelated with transitory firm-specific shocks that can determine outcomes (Wooldridge, 2002; Blundell and Dias, 2009). Section 4.2.2 provides evidence in support of these identification assumptions.

[16]This design is not challenged by selection on levels, observable or not. For instance, even before starting to supply to MNCs, first-time suppliers employ on average 19% more workers than never-suppliers in the same four-digit sector and province. In addition, a consistent estimate of the average treatment effect requires that treated and control firms experience the same macro shocks (Blundell and Dias, 2009). Differential trends might arise if treated and control units operate in different markets. We limit control firms to nearby firms in the same four-digit sector to account for common shocks, such as those to factor markets or transportation networks.

3.2 Alternative Empirical Strategies

3.2.1 "Productive Linkages" Event Studies

The rules of the "Productive Linkages" program generate quasi-experimental variation in opportunities to supply to MNCs among firms shortlisted for a given deal with an MNC. Procomer undertakes thorough evaluations of domestic firms willing to supply to MNCs and assigns them an overall score of readiness to do so. These scores reflect information that is relevant to MNCs, yet not available in typical tax data (e.g., whether the firm employs at least one English speaker). Based on scores, Procomer proposes shortlists of candidates to MNCs.[17]

The "Productive Linkages" event-study is a generalized triple-difference design where firms experience a first deal with an MNC in different years. We modify equation (1) to allow for an extra interaction between event dummies D^k_{idt} and an indicator dummy of winning deal d, $\mathbb{1}\{Winner\}_{id}$. We label the winner and losers of the same deal with the same d subscript. We investigate the effect of being considered for deal d on both the winner and losers of that deal by running the following regression:

$$y_{idt} = \alpha_i + \gamma_d + \lambda_t + \sum_{k=\underline{C}}^{\overline{C}} \theta^L_k D^k_{idt} + \sum_{k=\underline{C}}^{\overline{C}} \theta^{Diff}_k \mathbb{1}\{Winner\}_{id} D^k_{idt} + \varepsilon_{idt}, \tag{2}$$

where y_{idt} is the outcome of firm i part of deal d in year t, λ_t is the calendar year fixed effect, and $\mathbb{1}\{Winner\}_{id}$ is an indicator function that equals 1 if firm i is the winner of deal d. γ_d are deal fixed effects that force the effects on the winner to be measured with respect to those on the actual contenders to the same deal. Our coefficients of interest are θ^L_k and θ^{Diff}_k, which are interpreted as the effect of the event on the losers and on the difference in outcomes between winners and losers, respectively. All other variables are defined the same as for equation (1).

Identification relies on the assumption that shortlisted firms missing a deal with an MNC offer a valid counterfactual to what would have happened with the winners' performance had they not won the deal. As we observe the scores behind the ranking shared with MNCs, we can compare the scores of winners and losers. In Online Appendix A.2.2 we provide evidence indicating that the only meaningful difference between winners and losers is the timing of a first deal with an MNC (as opposed to ex-ante differences in scores or other observables).

3.2.2 Event Studies Combined with Matching Estimators

One advantage of the baseline exercise with economy-wide event studies is its sample size of 3,697 treated firms (in contrast to the 31 treated firms in the "Productive Linkages" exercise). Where the "Productive Linkages" exercise dominates the baseline exercise is in its ability to compare the outcomes of treated firms with the *contemporaneous* outcomes of *similar* firms (as witnessed by their scores). In what follows, we present three techniques which combine these two advantages, i.e., which use the same sample of 3,697 economy-wide first-time

[17] Online Appendix A.2.1 provides more background information on the program history and functioning.

suppliers as the treated firms and compare their outcomes to the contemporaneous outcomes of control firms which are similar in one of three ways defined below.

Matching by predicted Procomer scores. This exercise starts from the 630 Procomer scores assigned to 613 distinct firms in the years with administrative data (2008–2017). We regress the Procomer score of a firm-year on fourteen potential predictors of that score (in addition to twenty broad sector fixed effects). Among the predictors are measures of firm size, the share of college-educated workers, indicators for whether the firm is an exporter, employs workers with experience at an MNC or supplies to a big domestic firm. We then use the estimated coefficients (see Table D2 in Online Appendix D.1) to predict Procomer scores for all firm-years in the full economy-wide sample. The control group for each first-time supplier contains the three never-suppliers in the same four-digit sector that have the closest predicted Procomer score to the one of the first-time supplier in its event year.

We then estimate for each outcome a modified version of the event-study specification in equation (1). The modification involves an extra interaction between event-time dummies and an indicator dummy of becoming a first-time supplier in the year of the event. This version of equation (1) resembles equation (2) in that they both include a contemporaneous "winner vs. losers" comparison captured by the θ_k^{Diff} coefficients (estimating the effect of the event on the difference in outcomes between the first-time suppliers and their control group, this time constructed based on the predicted Procomer score). As in equation (1), we include firm fixed effects and four-digit sector $\times$ province $\times$ calendar year fixed effects.

Propensity score matching. We also implement the standard propensity score matching. In our case, the propensity score – denoted by $e(X_{it})$ – is the conditional probability that firm i is chosen as a first-time supplier to an MNC in year t. To obtain $e(X_{it})$ we estimate a year-by-year flexible probit model for the full economy-wide sample. X_{it} includes the same characteristics of firm i in year t that we used to predict the Procomer scores in the matching method described above (in addition to four-digit sector, year and province fixed effects). Table D2 (Online Appendix D.1) reports the results of the probit regression. We fix as the control group of a given first-time supplier the three never-suppliers in its four-digit sector with the closest propensity score in the event year of that supplier. We then compare the outcomes of all economy-wide first-time suppliers to those of firms in their personalized control group. We do so by estimating the same modified version of equation (1) described above.

Nearest neighbors matching. In this exercise, we match first-time suppliers with control firms that did not supply to MNCs based on the similarity of their pre-event outcomes. For each first-time supplier, potential control firm and outcome, we compute a loss function equal to the sum of squares of the deviations of the standardized outcome of the first-time supplier from that of the potential control firm. This sum is across the three years before the event, where the deviation of each year is equally weighted. We then select as the "nearest neighbors" the three firms in the four-digit sector of the first-time supplier with the lowest value of the loss function. These nearest neighbors serve as a counterfactual for first-time suppliers

in a generalized "difference-in-differences" estimation. Namely, our difference-in-differences estimate reflects the average difference in the outcomes of the first-time suppliers and their controls in the same event year, relative to the average difference in the year leading up to a first-time supplying event. For more details on this method, see Online Appendix D.1.1.

4 First-Time Suppliers to MNCs Improve Their Performance

4.1 Baseline Economy-Wide Event-Study Results

4.1.1 Standard Measures of Firm Performance

In what follows we rely on the event-study specification (1) and the economy-wide full sample to estimate the effects of starting to supply to an MNC on firm size and measures of TFP. These results characterize the 3,697 domestic firms that become first-time suppliers to an MNC in CR sometime between 2010 and 2015.

Firm size. Panels 1a-1d of Figure 1 plot the event-study coefficients for log total sales, number of workers, net assets (as a proxy for capital),[18] and input costs (as a proxy for materials). Reassuringly, we find no evidence of selection into supplying based on past firm growth. It is only after firms start supplying to MNCs that they experience strong and lasting growth. This growth already starts in the year of their first transaction with an MNC, with the average growth that year relative to the previous year being 16% in sales, 6% in the number of workers, and 9% in input costs. Net assets react with a one-year lag. Firms keep growing over the next years until reaching a plateau at 33% higher sales, 26% more workers, 22% more assets, and 23% higher input costs. Table 1 provides additional details.

The magnitude and long-run nature of these effects are noteworthy. In other settings where firms receive demand shocks that are comparable or larger, firms do not grow as much. For instance, Atkin et al. (2017) finds that Egyptian microenterprises that receive large export orders for rugs (with cumulative payments of 155,682 U.S. dollars for 2.5 years of work) did not increase their employment and capital usage. Similarly, supply-side interventions such as business training can also fail to boost firm scale (Karlan and Valdivia, 2011).

Measures of TFP. We first estimate TFP using OLS, assuming either a Cobb–Douglas or translog technology. To this end, we extend the specification (1) by using log sales as the outcome variable and the logs of the number of workers, net assets (as a proxy for capital), and input costs (as a proxy for materials) as time-varying controls.[19] As OLS does not account for the potential endogeneity of input choices, we also use the methods proposed by Levinsohn and Petrin (2003) and Ackerberg et al. (2015). In cases without input and output price

[18] The net assets variable is the sum of (i) cash and other liquid assets, (ii) shares/stocks, (iii) inventories, and (iv) total fixed assets. In the terminology of the Costa Rican Ministry of Finance, the "net" designation means that the fixed assets part of this variable is already net of depreciation, amortization, and depletion.

[19] We use net instead of fixed assets because there are fewer missing or zero firm-year values for net assets. TFP estimates using fixed assets are virtually identical and are available upon request.

variations correlated with the event, these two methods provide credible estimates of true TFP.

Additionally, we adapt the TFP estimation procedure of De Loecker (2013) such that the endogenous TFP process that is accommodated by this procedure is no longer learning from exporting, but learning from supplying to an MNC. With this adapted method, we can explore the possibility that supplying to an MNC shapes a firm's future TFP while allowing other firm-level actions (e.g., investment decisions) to also impact future TFP. This method addresses the potential bias of ignoring a firm's MNC-supplying experience in the underlying TFP process (bias that might affect standard proxy estimators such as Levinsohn and Petrin, 2003).

Panels 1e and 1f in Figure 1 summarize the TFP results and Table 1 provides more details. Reassuringly, firms that start supplying to MNCs do not display a history of TFP growth. After their events, however, suppliers exhibit large increases in TFP, such that four years later, TFP is 4 to 9% higher than in the year before the event (depending on the estimation procedure).

Markup effects (or lack thereof). The TFP estimates above might be upward biased if first-time suppliers to MNCs start charging higher markups – to the first MNC buyer alone or to other buyers as well. This can happen if supplying to MNCs leads to quality improvements, higher-quality goods carry higher markups (as in Atkin et al., 2015), and there are no countervailing forces that tend to compress markups (such as switching to buyers with greater bargaining power or markets with tougher competition, as in Acemoglu and Tahbaz-Salehi, 2020; Alviarez et al., 2020; Mayer et al., 2014). We will argue that while the first two conditions may be met, the third condition is unlikely to be met in our empirical setting.

Before proceeding with our evidence, an important caveat is in order. Namely, lacking data on prices and quantities for domestic transactions makes it difficult to rule out definitively the possibility that part of the estimated TFP gains reflects higher markups. That said, in what follows, we provide several pieces of evidence that strongly suggest that at least part of the estimated TFP effects capture an actual increase in productivity and/or quality.

First, in Table C1 (Online Appendix C) we use the empirical models of De Loecker and Warzynski (2012) and Sampi et al. (2021)[20] to show unchanged (or declining) average markups for first-time suppliers to MNCs. This evidence is in line with our surveys, which point to the strong bargaining power of MNCs and their ability to squeeze suppliers' margins.[21] Previous research reports similar findings (e.g., Javorcik, 2008; Javorcik et al., 2008).[22] Our surveys also suggest that even when the quality of the domestic firms' products increases after the first MNC linkage, these higher-quality products are sold at unchanged or falling prices (to both the first MNC buyer and other buyers). See Section 6 for details.

[20] Sampi et al. (2021) provide a work-around solution to the concerns raised by Bond et al. (2021) on the interpretation of markups estimated using the ratio of the output elasticity of a variable input to that inputs cost share in revenue (such as in De Loecker and Warzynski, 2012). Moreover, the Sampi et al. (2021) method is appropriate in settings where measuring the change in markups (as opposed to their level) is enough.

[21] MNCs have privileged access to imports (e.g., MNCs in Free Trade Zones are exempted from customs duties) and leverage their corporate commodity managers to learn about suppliers abroad. Moreover, the leading international suppliers of MNCs tend to pursue their buyers as they open new affiliates (a practice called *follow sourcing*). The larger the MNC, the more likely it is to have these sourcing advantages. These factors combined leave little room for domestic suppliers to obtain higher markups from MNCs.

[22] For instance, 40% of suppliers to MNCs in the Czech Republic had to lower prices by 1 to 30% (Javorcik, 2008).

Second, as we will see in the next section, starting to supply to MNCs improves the sales of domestic firms made to other buyers. Suppose first-time suppliers learn from the first MNC buyer how to produce higher-quality products, and their other buyers also demand such products. One might be concerned that the increase in sales to others captures only higher markups on those higher-quality products. For plausible values of the demand elasticity (specifically, for values lower than -1), without a fall in marginal costs and/or an increase in the demand shifter (product quality or appeal) that are large enough to compensate for the higher markups, higher markups alone would lead to a fall in sales in others. Online Appendix E.3.3 contains the formal argument. Moreover, the tendency of higher markups on higher-quality goods may be offset by the greater bargaining power of the new buyers of first-time suppliers, who (as shown in the next section) are larger and more internationally exposed.

4.1.2 Business with Other Buyers

With the aid of the firm-to-firm transaction data, we now explore the patterns of business of first-time suppliers with all buyers *except* the first MNC buyer. This exploration has two goals. First, it addresses the natural concern that the firm growth documented so far is owed primarily to the addition of the new MNC buyer. Second, we will argue that what happens to the business of first-time suppliers in other markets (in this case, with all their other buyers in CR) is informative on both the mechanisms behind the effects of a first linkage with an MNC and firm fundamentals more broadly (such as the marginal cost elasticity).

Let us first define a couple of objects of interest. The "sales to others" are equal to total sales minus the sales to the first MNC buyer, where the total sales come from the corporate income tax returns and the sales to the first MNC buyer come from the firm-to-firm transaction data. The "corporate buyers" of a firm in a given year are its buyers reported in the firm-to-firm transaction data, i.e., firms in CR whose purchases of goods or services from that firm exceed 4,200 U.S. dollars that year. The "total corporate sales" are equal to the sum across the sales to all corporate buyers in the firm-to-firm transaction data. The "corporate sales to others" exclude the sales to the first MNC buyer. Aside from total corporate sales, total sales contain exports and sales to end consumers and to firms in CR whose purchases that year sum up to less than the reporting threshold. We call this difference "non-corporate sales."

In addition to the pattern of total sales (sales to all buyers), Figure 2 shows the patterns of sales to all buyers *except* the first MNC buyer, all corporate buyers, and all corporate buyers *except* the first MNC buyer. Across the four types of buyers, we do not find evidence of differential trends in sales before the event of a first sale to an MNC. However, we find large and lasting increases in the four types of sales after the event. Most importantly, these increases are not mechanical as they survive the exclusion of the sales to the first MNC buyer. Four years after the event, sales to others increase by 20%, while corporate sales to others increase by

45%.[23] Table 2 provides details and robustness checks (e.g., showing that the baseline results are not driven by demand from buyers who are themselves new suppliers to MNCs).

Extensive vs. intensive margin responses. Next, we ask whether these changes in sales to others materialize primarily along the extensive or the intensive margin. Panel 2e in Figure 2 depicts the extensive margin response (i.e., the effect of the event on the log number of corporate buyers, except the first MNC buyer), while panel 2f looks into the intensive margin response (i.e., the effect on the average value of transactions across all other corporate buyers). Reassuringly, in the years preceding the first linkage with an MNC, we find no differential trends in either the number of corporate buyers or the average sales to others. After the event, however, both margins react. Four years later, first-time suppliers have 31% more corporate buyers and average transactions are 14% larger than in the year before the event. Hence, of the 45% increase in corporate sales to others, the intensive (extensive) margin accounts for one (two) third(s) of the increase.[24] Table 2 provides more details.

Short- vs. medium-run adjustments. The focus on the effects four years after the event conceals striking short-run adjustments. Namely, in the year of the event, the sales to others decrease by 19%, the corporate sales to others by 75%, and the non-corporate sales to others by 9%. Most of the 75% drop in corporate sales to others occurs along the intensive margin. Specifically, the average sales to others drop by 78% in the year of the event, while the number of other buyers increases by a modest 3%. For details, see Table 2.

These findings suggest that firms are capacity-constrained in the short-term. While capacity constraints can encompass more factors than what is captured by our net assets variable (say managerial attention), the finding that the net assets react with a one-year lag is consistent with the idea that firms cannot adjust fixed inputs in real-time. The short-term need to scale down the business with other buyers is one to which we will return in Section 5.2.

Changes in buyers' characteristics. Our data merge allows us to go beyond tracking responses in the business with others, where the "others" are left anonymous. Figure C1 (Online Appendix C), breaks down the corporate sales of first-time suppliers to an MNC by whether a buyer is old or new and an MNC or not. We define an "old buyer" as a buyer to whom the first-time supplier sells by the event year. To provide a reference point, we also study never-suppliers that are randomly assigned a fake event year between 2010 and 2015. Four years after the event, around 60% of the corporate sales of first-time suppliers go to new buyers acquired after the event. This percentage stands in contrast to slightly more than 50% for never-suppliers. Hence, while the churning of old buyers is not a pattern limited to first-time suppliers, new buyers are clearly more important for them than for never-suppliers. For

[23] Naturally, the discrepancy between the increases in the sales to others and corporate sales to others is driven by the behavior of non-corporate sales. Four years after the event, non-corporate sales increased by 16%, making the share of non-corporate sales out of all sales to others fall by 7%. Hence, first-time suppliers have shifted their sales more toward corporate buyers, i.e., toward firms with purchases above 4,200 U.S. dollars per year.

[24] Our findings of increased sales to others suggest that these other buyers may have benefited as well from the upgrades of the first-time suppliers (as in Kee, 2015). While potential gains to domestic buyers are relevant to any estimation of the aggregate effects of MNCs, they are beyond the scope of this paper.

legibility, the "domestic buyers" in Figure C1 bundle domestic firms, non-MNC but partially foreign-owned firms, and the government. While most corporate sales to new buyers are to new "domestic buyers," first-time suppliers also acquire new MNC buyers.[25] Four years after the event, on average, 6% of the sales of first-time suppliers go to 1.2 new MNC buyers.[26]

Table 4 provides additional evidence that joining the supply chain of an MNC induces changes in the buyer characteristics of first-time suppliers. We first find that four years after acquiring a first MNC buyer, domestic firms sell to buyers in 18% (21%) more two-digit (four-digit) sectors. Meanwhile, first-time suppliers do not buy from more two-digit (four-digit) sectors. Next, we learn that the sales of first-time suppliers (four years after) are made to buyers with 49% more workers, 53% higher sales, 30% more suppliers, and 40% more buyers. First-time suppliers tend to sell to buyers who are slightly more internationally exposed, as proxied by their share of exports in total sales and imports in total inputs. Finally, first-time suppliers sell to buyers with more substantial relationships with all their suppliers, as measured by the 19% higher average value of transactions and 8% longer relationships.[27]

Overall, our evidence on the persistent boosts in performance with other buyers (in particular, on the improved ability to acquire new buyers), the changing composition of sales by buyer type (e.g., from old to new), and the better-performing new buyers (e.g., larger size or longer supplier relationships) of first-time suppliers to MNCs are consistent with improvements in productivity, product scope and quality, and reputation for first-time suppliers.

4.2 Robustness Checks to the Baseline Results

4.2.1 Results from Alternative Empirical Strategies

Table 3 presents the event-study estimates obtained from the four alternative strategies described in Section 3.2, namely the "Productive Linkages" strategy and the three matching estimators applied to the economy-wide sample. Table 3 focuses on three of our main outcomes:

[25] Figure C1 has to focus on corporate sales, as it is only with the firm-to-firm transaction data that one can establish whether a buyer is old or new and an MNC or not. In Figure C2 we study total sales, which include the non-corporate sales (the sum of exports and the part of local sales not reported in the firm-to-firm transaction data). Figure C2 disaggregates the total sales of first-time suppliers into a more narrowly-defined set of buyers: the government, domestic firms and consumers, non-MNC partially foreign-owned firms, MNCs, and exports. Here, the sales to domestic firms and consumers are computed as the residual from the total sales minus the sales to MNCs, sales to partially foreign-owned firms that are not MNCs, exports, and sales to the government. We find that most of the increase in total sales after the event stems from sales to domestic firms and consumers (this time, more narrowly defined). Other buyers also tend to increase their purchases, though more modestly.

[26] Tables B4 and B5 (Online Appendix B) provide more details on post-event relationships with MNCs. Moreover, Tables C2 and C3 (Online Appendix C) expand our event-study analysis to study the effects of subsequent MNC buyers. Namely, in these tables, a year with an event is any year in which a domestic firm starts supplying to a *new* MNC buyer (the first MNC buyer or a subsequent one). Table C2 splits the baseline sample of first-time suppliers to MNCs based on their total number of years with events. The more years with events a first-time supplier has, the stronger its overall growth in size and TFP. Table C3 compares the pooled (before vs. after) change in total sales and TFP after each new year with an event. After each additional year with an event, firms experience a slight increase (decrease) in the pooled change in sales (TFP). While caution is warranted in drawing causal inferences, these findings are suggestive of the value of expanding one's portfolio of MNC buyers.

[27] To avoid mechanical results, we exclude the first MNC buyer from all results in Table 4. Changes in firm size also do not explain these results, as we have already controlled for the suppliers' contemporaneous total sales.

total sales, TFP residual from an OLS production function estimation under a Cobb–Douglas technology, and the corporate sales to others.[28] We contrast the estimates for each alternative strategy and outcome with our baseline estimates summarized in Tables 1 and 2.

Reassuringly, across methods and outcomes, we find either a lack of or sporadic pre-trends. Moreover, all four sets of event-study estimates display the same qualitative patterns as the baseline estimates (e.g., the extensive margin response of new buyers is the leading driver of the rise in sales to other buyers). While the point estimates tend to vary across empirical strategies, the confidence intervals overlap for most outcomes and event years. This is true despite these alternative approaches using control groups built on either more information than what is typically observed in administrative data (but captured in the Procomer score) or stronger predictors of supplying linkages than the sector and province of a firm. Overall, it is encouraging that these four alternative approaches support our baseline results.

4.2.2 More Robustness Checks to the Baseline Economy-Wide Event Studies

Our baseline economy-wide regressions allow in the sample of control firms the "never-suppliers," i.e., domestic firms never observed as supplying to an MNC throughout 2008 to 2017. To assuage concerns over the similarity between first-time suppliers and never-suppliers to MNCs, Online Appendix D.2 explores the implications of dropping from the control group all or part of the never-suppliers. Table D4 shows that the baseline estimates hold up to dropping *all* the never-suppliers. This suggests that the driver of our baseline results is the staggered timing of the event, and not the contrast to never-suppliers. In Table D5, we only exclude the never-suppliers to an MNC that are also never-suppliers to a large domestic firm throughout 2008 to 2017. This exercise therefore accepts in the control group only firms having sold to a large buyer. These new event-study estimates remain similar to the baseline ones.

There is one important threat to identification that is not addressed by our analysis thus far: firms may experience unobservable firm-specific shocks that affect both the timing of their first supplying relationship with an MNC and their subsequent performance. While not all such shocks need to be embodied in new employees, the hiring of new influential employees before the first sale to an MNC is among the most plausible confounding factors. Problematic influential employees would need to be able to both establish the first contract with an MNC and improve firm performance. In Online Appendix D.3 we investigate this scenario using matched employer-employee data from the Costa Rican Social Security Fund.

We first consider the hiring of a new manager, as managers can impact overall firm performance. We first define managers as the firm's top two earners. Alternatively, we take as managers workers whose occupation is categorized as managerial by ISCO-08. From the baseline sample of first-time suppliers, we then drop those having hired a new manager in either the year of their event or the year before. We also consider hiring workers straight from an MNC or a supplier to an MNC as another plausibly concerning event. Such workers may both

[28] Table D1 (Online Appendix D.1) reports the estimates for the number of workers, the number of other buyers, and the average sales to other buyers.

use their MNC contacts to generate a first MNC contract for their new employer and transfer knowledge acquired during their previous employment (improving the performance of their new employer). We then exclude from the baseline sample of first-time suppliers those who have hired a new worker – in either the year of their event or the year before – whose previous main employer was one of the 622 MNC affiliates in CR (or, in a separate exercise, was a supplier to one of these MNCs).[29] Our findings survive all of these four exclusions. While it is impossible to fully dismiss the threat of firm-specific shocks with the problematic traits mentioned above, this evidence suggests that worker-embodied shocks are unlikely confounders.

Finally, we probe the sensitivity of our results to relaxing the restrictions imposed onto the main sample described in Section 2.2. In Online Appendix D.4 we relax both one-at-a-time and simultaneously the size and sectoral restrictions set on either the domestic firms or MNCs in the baseline sample. Across variables and sample variants, our main takeaways from Tables 1 and 2 remain unaffected. Moreover, our key takeaways remain qualitatively similar across significant variations in fixed effects, including fixed effects that control for trends in more disaggregated geographic units (see Online Appendix D.5). Results also remain largely unchanged for a balanced sample in event time (see Online Appendix D.6). These alternative exercises corroborate the robustness of our baseline event-study specification and sample.

5 More Evidence from Admin Data to Guide Interpretation

5.1 MNC Demand Shocks Differ from Those from Large Domestic Buyers

We now carry out three placebo event studies where we define the event as a first sale to the government, a large domestic firm, or a domestic exporter, respectively. Thanks to the firm-to-firm transaction data, we observe 1,447 domestic firms that started supplying to one of 98 government entities, 1,944 that started supplying to one of 373 large domestic firms, and 1,432 that started supplying to one of 385 domestic exporters. These placebo event studies allow us to shed light on the remarkable effects of demand shocks from MNCs.

First, MNCs may differ from domestic firms not only in their potential for knowledge transfers but also in other traits that are by themselves attractive to suppliers (e.g., reliable payment or the potential for scaling the collaboration, as in Ferraz et al., 2016). The placebo exercise with government demand shocks probes whether these features drive our results.

One might be concerned that the government is not a buyer who values high-quality inputs and, therefore, that its suppliers are negatively selected. Alternatively, even if the government appreciates such inputs, one might think that it does not know how to achieve or enforce the high quality. Then our findings may be due to MNCs' taste for quality and ability to guide it, and not to their MNC nature per se. The two placebo exercises with demand shocks from either a large domestic buyer or a domestic exporter investigate these possibilities. For comparability with the baseline sample of MNCs, we take as large domestic firms all domestic

[29] We exclude all firms hiring one of these types of workers, irrespective of the occupation taken at the new firm.

firms whose median of workers is over 100 workers (across all years of activity in the country). Also, for comparability with MNCs (who tend to be consistently export-oriented), we take as domestic exporters those domestic firms that are observed as exporting in all years.

One option is to directly compare the estimates from these placebo exercises with those from the baseline exercise on the full sample of first-time suppliers to an MNC. One caveat is that, on average, the event of starting to supply to an MNC may differ from these three other types of events. Tables E2 to E7 (Online Appendix E.2) test for differences in characteristics of the first-time suppliers (e.g., supplier sector), the first buyers (e.g., average number of suppliers), and their first interaction (e.g., average duration). As we do detect some statistically significant differences,[30] we use a matching procedure that limits the dissimilarity between the baseline and placebo events to only that between the buyers triggering the events.[31]

We implement all three placebo exercises with the same specification as in equation (1), altering only the definition of the event. Figure 3 plots the event-study coefficients from these three placebo events on two outcomes: log TFP from an OLS production function estimation that assumes a Cobb–Douglas technology and log corporate sales to others. For reference, we also include in this figure the event-study estimates for the matched sample of first-time suppliers to MNCs. Figures E1 and E2 (Online Appendix E.2) also study total sales, the number of workers, number of other corporate buyers, and average sales to other corporate buyers.

Despite built-in similarities in the traits of the suppliers and of their first relationship, we notice that after the event, the trends of the first-time suppliers to placebo buyers and the matched sample of first-time suppliers to MNCs diverge decisively. First-time suppliers to placebo buyers exhibit weaker and shorter-lived improvements in firm performance than first-time suppliers to an MNC. For instance, their TFP gains are smaller and statistically significant only in the first two years after the event. The sales to other buyers experience similar drops in the year of the event. However, while in the following years, first-time suppliers to MNCs see continued growth in their sales to others, first-time suppliers to placebo buyers see their sales to others trend back to their pre-event level. To conclude, for both these and other variables, by the third year after the event, first-time suppliers to the placebo buyers revert to their pre-event performance. In contrast, first-time suppliers to MNCs show persistent improvement.

[30] For instance, first-time suppliers to the government or to a domestic exporter tend to be larger than those to an MNC, whereas first-time suppliers to a large domestic firm tend to be similar in size. First-time suppliers to all three types of placebo buyers tend to receive a smaller and shorter-lived demand shock than those to an MNC.

[31] The matching is based on key characteristics of the first-time suppliers and their first relationship with the relevant buyer (see these characteristics in Tables E5 to E7). We proceed in two steps. First, we restrict the candidates for matching in the sample of first-time suppliers to MNCs to being in the same sector and location as the firm (i.e., the first-time supplier to the placebo buyer) to be matched. For each leftover variable, we compute a z-score. We then construct a loss function, defined as the equally-weighted sum (across all the leftover variables) of squares of differences between the z-score of the candidate match and that of the firm to be matched. The match for a given first-time supplier to a placebo buyer is the first-time supplier to MNCs in the same sector and location with the smallest value of the loss function.

5.2 Short-Run Effects Suggest Steep Short-Run Marginal Cost Curves

Our event-study evidence from Section 4.1.2 shows that first-time suppliers to an MNC significantly scale back their sales to other buyers in the year of the event. One could think that this feature is specific to supplying to MNCs (for instance, due to potential exclusivity clauses). However, Figure 3 shows that firms experiencing other types of demand shocks also display similar patterns (even those supplying to the government – who does not impose exclusivity clauses). The pattern of interdependence between sales to one buyer and sales to all others is at odds with the standard Melitz (2003) framework and subsequent work in which firms are assumed to have a constant marginal cost. The constant marginal cost assumption implies that demand shocks from one buyer do not affect the sales to other buyers.

One natural interpretation of the short-lasting drop in sales to others is the presence of a steep marginal cost curve in the short-run (due to fixed factors or capacity constraints) that becomes flatter in the medium-run. To quantitatively explore this idea, we present a simple model that rationalizes our empirical findings. The model is an abridged adaptation of the one in Almunia et al. (2020) that still captures the main intuition of interdependence between sales to different buyers. In our model, firms are allowed to face an increasing marginal cost with respect to the quantity produced. This can be justified by a production function for the firm that aggregates fixed or pre-determined inputs and flexible ones. When firms experience a positive demand shock, they increase the usage of flexible inputs (such as labor). Everything else equal, this demand shock leads to an increase in the short-run marginal cost. This increase in the marginal cost increases prices and results in a loss in competitiveness with other buyers, translating into a decrease in sales to these other buyers.

A stylized model with non-constant marginal costs. Consider a set of domestic supplier firms indexed by i selling a variety of a good to buyers indexed by j. We assume that supplier i faces an isoelastic demand from buyer j given by $q_{ij} = b_{ij} p_i^{-\sigma}$, where q_{ij} denotes the units of output that buyer j demands from supplier i, p_i is the price that supplier i charges, and $\sigma > 1$ is the elasticity of demand. $b_{ij} = \left(b_{ij}^*\right)^{\sigma-1}$ is a demand shifter that could be interpreted as an adjustment of the price for the quality or appeal of the good of supplier i, among others. The supplier produces a total quantity $Q_i = \sum_j q_{ij}$ with a total cost function given by

$$TC(Q_i) = \kappa_i \left(\frac{Q_i}{\phi_i^*}\right)^{\gamma+1}, \tag{3}$$

where ϕ_i^* refers to physical efficiency and κ_i is a constant. Note that γ is the marginal cost elasticity with respect to total output ($\gamma > -1$). As shown by Almunia et al. (2020), a cost function like the one in equation (3) can be derived in a model where the production function of the firm is a Cobb–Douglas aggregator of a fixed or pre-determined input and a flexible input. We also show that when all inputs are flexible, the total cost function in equation (3) encompasses both Cobb–Douglas and general returns to scale CES production functions (see Online Appendix E.3.1). In such case, $1/(\gamma+1)$ can be interpreted as the returns to scale of

the firm. A value of $\gamma > 0$ ($\gamma < 0$) would imply decreasing (increasing) returns to scale.

Consider now an event where supplier i starts selling an amount $R_{i,M} \equiv p_i q_{i,M}$ to a given firm M. Define sales to firms other than M ("sales to others" henceforth) as $\tilde{R}_i \equiv p_i \tilde{Q}_i$, where $\tilde{Q}_i = \sum_{j \neq M} q_{ij}$. We solve for the optimal level of sales to others in Online Appendix E.3.2. Taking log differences of the optimal sales to others τ years after the event versus the year before the event, we find:

$$\Delta_\tau \ln(\tilde{R}_i) = \delta \Delta_\tau \ln(\tilde{R}_i + R_{i,M}) + (\sigma - 1)\Delta_\tau \ln(\phi_i), \tag{4}$$

where $\delta \equiv -(\sigma - 1)\gamma/(\gamma + 1)$ is our object of interest. This parameter governs the interdependence between changes in the total sales of firm i (due to the demand shock from firm M) and its sales to others. The $\phi_i \equiv \phi_i^* \tilde{B}_i^*$ term is the revenue-productivity of firm i, incorporating both its physical efficiency and demand adjustments for quality reflected in the demand shifter aggregator $\tilde{B}_i^* \equiv \left(\sum_{j \neq M} b_{ij}^{*\sigma-1}\right)^{1/(\sigma-1)}$. This means that increases in physical productivity or product quality are isomorphic in terms of their effect on sales.

If the marginal cost of production is constant ($\gamma = 0$) and there is no change in revenue-productivity ($\Delta_\tau \ln(\phi_i) = 0$), then the demand shock $R_{i,M}$ does not affect the sales to others $\tilde{R}_i$. However, if the marginal cost is, say, increasing ($\gamma > 0$), then the demand shock decreases the sales to others even when ϕ_i stays constant. This is because the change in total production affects the marginal cost and, thus, the price of firm i. In general, the more elastic the demand, the more sensitive sales to others are to changes in the marginal cost induced by changes in total production. Also, the more distant γ is from zero, the more the marginal cost changes with total production, and thus, the more the sales to others are affected via price changes.

Implications of our event-study evidence for the dynamics of the marginal cost. We now exploit the staggered timing of the event and the different time horizons (indexed by τ) at which we can estimate the effects of the event to explore the dynamics of δ (and the marginal-cost elasticity γ). Taking expectations in equation (4) across all first-time suppliers i, we have:

$$\delta = \frac{\mathbb{E}\left[\Delta_\tau \ln(\tilde{R}_i)\right] - (\sigma - 1)\mathbb{E}\left[\Delta_\tau \ln(\phi_i)\right]}{\mathbb{E}\left[\Delta_\tau \ln(\tilde{R}_i + R_{i,M})\right]}. \tag{5}$$

To provide an estimate of δ we need estimates of the change in sales to others $\mathbb{E}\left[\Delta_\tau \ln(\tilde{R}_i)\right]$, the change in revenue-productivity $\mathbb{E}\left[\Delta_\tau \ln(\phi_i)\right]$, the change in total sales $\mathbb{E}\left[\Delta_\tau \ln(\tilde{R}_i + R_{i,M})\right]$, and an estimate for the demand elasticity σ. For the baseline estimates of δ, we estimate the first three moments by leveraging our event-study specification for the case of first-time suppliers to MNCs (i.e., we take firm M to be the first MNC buyer). We also set $\sigma = 5.03$ (which we infer from the average markup in the economy).[32] We then provide estimates of δ at different event-time horizons τ (from the year of the event to up to four years after the event). Moreover, we use the relationship between the marginal cost elasticity γ

[32] We estimate the average markup (μ) using the methodology of De Loecker and Warzynski (2012) (see Table E8, Online Appendix E.3.4). We then infer σ from the fact that the isoelastic demand implies $\mu = \sigma/(\sigma - 1)$. A value of $\sigma = 5.03$ is central in the range of estimates in the international trade literature (see Head and Mayer, 2014).

and δ, namely $\gamma = -\delta/(\delta + \sigma - 1)$, to infer the value of γ from that of δ. Finally, we obtain standard errors for these estimates of δ and γ using a bootstrap procedure.

Table 5 presents our baseline results. Columns (1) and (2) refer to the estimated δ and γ when we use the total sales and the sales to others constructed from the corporate income tax returns. Columns (3) and (4) replace the total sales by the total corporate sales and the sales to others by the corporate sales to others (where "corporate" is used only for sales that are traced in the firm-to-firm transaction data). Our preferred estimates are those from columns (1) and (2) since total sales (as opposed to total transactions) map directly to the model. However, both exercises paint a similar picture.

Column (1) shows estimates of δ that are large and negative in the short-run, but that approach zero over time ($\delta = -2.70$ in the year of the event versus $\delta = -0.43$ four years after). Column (2) shows an estimate of the marginal cost elasticity $\gamma = 2.03$ in the year of the event. This value points to a significant departure from the constant marginal cost ($\gamma = 0$) assumption and implies weak short-run returns to scale of the flexible inputs (around 0.33). Similar to the estimates of δ, the estimates of γ also decrease over time. In particular, four years after the event we find a value of $\gamma = 0.12$ (we still reject the null of $\gamma = 0$). A value of $\gamma = 0.12$ implies that when all inputs are flexible, the returns to scale are equal to $1/(1+\gamma) = 0.89$. This 0.89 value is close to the 0.92 value found when estimating the production function with standard methods (see Table E8, Online Appendix E.3.4). Thus, the simple model is consistent with our event-study evidence and other moments of the data.

As mentioned above, the short-run decrease in sales to others in the year of the event is not unique to first-time suppliers to MNCs. To highlight the commonalities with other demand shocks, we also provide alternative estimates of δ and γ based on event studies where the event is that of becoming a first-time supplier to the government, domestic exporters, or big domestic firms (see Table E9, Online Appendix E.3.5). All three cases remain consistent with a steep short-run marginal cost curve in the year of the event ($\delta \in [-3.68, -1.69]$) and a less steep marginal cost curve four years after ($\delta \in [-1.29, -0.97]$). Moreover, our estimates of δ are also compatible with those of Almunia et al. (2020), who study the export behavior of Spanish firms after a negative domestic demand shock around the 2008 crisis. Their preferred estimate of $\delta = -2.374$ is in the ballpark of our short-run estimates.

Overall, this exercise indicates that firms have upward-sloping marginal cost curves in the short-run – most likely because firms cannot immediately adjust fixed factors such as capital – and closer to flat marginal cost curves in the medium-run. We also show that the dynamics of the marginal cost are qualitatively similar across different types of demand shocks. This similarity suggests that the short-run adjustments uncovered by our event studies are not unique to supplying to MNCs, but they plausibly reflect general constraints faced by firms.

5.3 Results Do Not Simply Capture Changes in Tax Compliance

One might worry that domestic firms starting to supply to MNCs improve their tax compliance in ways that cast doubt on the interpretation of our baseline results. The third-party

reporting structure of the firm-to-firm transaction data offers a unique opportunity to evaluate this concern. In theory, third-party reporting has self-enforcing properties. However, when tax authorities lack resources to pursue inconsistencies in the reports of the buyer and supplier of a transaction, the odds of being audited are not equally distributed across transactions and firms. This weakens the incentives of compliance for transactions or firms under lower scrutiny. If domestic firms believe that MNCs are more prone to audits than domestic buyers, this may impact the accuracy of their D-151 reporting (similar to Pomeranz, 2015).

Firms can improve their D-151 reporting by reducing gaps in reported values for transactions declared by both firms in a buyer-seller pair and/or by lowering the share of transactions only reported by one party. We construct three proxies of reporting quality. The first is a weighted average of the within-pair percentage difference between the larger and the smaller of the two values reported, across all pairs where a given firm is the seller. If buyers consistently report larger amounts than sellers (as tax evasion incentives would suggest), then this measure captures the extent of under-reporting of one's sales compared to the reports of one's buyers. The second measure keeps only pairs where a firm is the buyer and is meant to quantify the extent of over-reporting of its purchases. Finally, we construct a measure of the frequency of transactions found only in the D-151 forms of one firm in the pair.

We find that becoming a supplier to MNCs is unlikely to have a bearing on either measure of third-party reporting quality, and if it does, the effect is the opposite to that predicted by a reduction of tax-evasive behaviors (for details, see Table E10 in Online Appendix E.4). Hence, we do not ascribe our results to changes in third-party reporting behavior.

Moreover, we resort to the matched employer-employee data (MEED), which records the employment of workers with social security contributions (i.e., formal employment). A working-age individual who is not in MEED in a given year might either be nonemployed that year, work informally (i.e., without social security contributions), or be a foreign worker not yet integrated in the Costa Rican labor market. We ask whether the event of starting to supply to MNCs leads domestic firms to increase the share of new hires who come from "outside" the MEED. An increase in this share cannot by itself prove that first-time suppliers are formalizing incumbent informal workers, as firms might still be legitimately growing by hiring workers who were either nonemployed, working informally for a different firm, or were newly-arrived foreign workers; however, it would at least raise suspicions of formalization. That said, the lack of significant effects of the event on this share (whether we include or exclude foreign workers) suggests that the growth in employment of the new suppliers is real and not a mere reporting response. This evidence is described in Table E11 (Online Appendix E.4).

5.4 Not All First-Time Relationships With an MNC Are Created Equal

In this subsection, we characterize the heterogeneity of TFP gains by traits of the first-time supplier, first MNC buyer, or their first interaction. In Table 6, we first split domestic firms based on either their sector or that of their first MNC buyer, where sectors fall into one of four groups: manufacturing, retail (including repair and maintenance), services, or agriculture.

Domestic firms in manufacturing experience the largest TFP gains from supplying to MNCs, while those in services and retail attain only half of those gains. Suppliers in agriculture see no effect. When we split firms by the sector of the MNC buyer, only those starting to supply to an MNC in manufacturing or services see their TFP improve.

Second, in Table 7, we ask whether the TFP effects vary by the importance of the transaction to either the MNC or supplier. We first measure its importance to the MNC by the I-O share of the purchases of the MNC sector from the supplier sector out of the total purchases of the MNC sector. We find that domestic firms whose inputs tend to be more important ("core") to their first MNC buyer experience higher TFP gains. We then compute the median of the values of the first transaction with an MNC and split suppliers by whether their first transaction was below or above this median. All TFP gains are concentrated in the above-median sample.

Third, in Table C4 (Online Appendix C), we examine whether the "footprint" of the MNC in CR matters for the TFP gain potential. We first split the first MNC buyers into below- and above-median groups of affiliate sizes in CR. Irrespective of whether we measure the affiliate size as the number of workers, total sales, or local purchases, smaller MNC buyers tend to generate stronger TFP gains for their first-time suppliers. One plausible reason is that larger MNC affiliates invest less in local suppliers because they have a stronger bargaining position or outside options (see footnote 21 for additional intuition).

Fourth and last, Table C5 (Online Appendix C) asks whether the TFP gains differ by the headquarter (HQ) country of the first MNC buyer. The first split of HQ countries is by region. From this split, we learn that TFP gains are mostly driven by MNC buyers that are either U.S. or Canada-owned. The second split of HQ countries is by their GDP per capita (PPP). MNC buyers with higher GDP per capita HQ countries bring larger TFP gains. Finally, we split HQ countries by their quality of management (as measured by the World Management Survey). MNC buyers from HQ countries with better management practices yield stronger TFP gains.

In sum, not all first-time relationships with an MNC are created equal. Domestic firms in manufacturing, who supply a core input to the MNC, and/or have a stronger first interaction with the MNC are those who gain most from their event. Moreover, it is most beneficial to start supplying to MNCs in manufacturing and services, smaller MNC affiliates, and/or MNCs whose HQ country has a higher GDP per capita and better management practices.

6 Additional Survey-Based Evidence to Guide Interpretation

We now focus on the lessons from our surveys that directly address why and how domestic firms improve their performance after linkages with MNCs.[33] We first inquired on the expectations of MNCs and domestic suppliers ahead of a first linkage. When evaluating a potential supplier, MNCs pay particular attention to input quality, the willingness or ability of the supplier to adapt to the MNC's needs, the price, and organizational traits such as reliability or input traceability. Before their first MNC buyer, all domestic firms expected MNCs to differ

[33] Online Appendix F details the rest of our survey findings.

from domestic buyers. The largest expected differences involved MNCs placing larger orders, being more reliable payers, offering longer contracts, and helping suppliers to adopt better management practices. Despite expecting differences, domestic firms were still taken by surprise by the quick pace, breadth, and depth of the changes necessary to supply to MNCs. For many of them, what followed after their first MNC deal was *"as if being thrown into the water without knowing how to swim and having to learn fast"* (direct quote from one business owner).

When asked if they offer any explicit support to new suppliers, 69% of MNCs claimed to provide such support – mainly in the form of sharing of *blueprints* or details about the expected product or services, visits of the supplier to the MNC to learn about the use of the input, and visits of the MNC to the supplier to carry out audits and advise on upgrades. Moreover, 44% of domestic suppliers acknowledged receiving support consistent with what MNCs described. According to one domestic supplier, working with MNC buyers feels like having access to a "*global catalog of best practices*." MNCs are more likely to perceive their interactions as direct help than domestic suppliers for two reasons. First, MNCs are not only notoriously demanding with their suppliers but also expect them to adapt fast. MNCs admitted that the pressure to adapt quickly was one of the largest disadvantages or risks for new suppliers.[34] Second, domestic suppliers declared that they alone bear most of the adaptation efforts.

Of the 69% of MNCs claiming to provide explicit help to their new domestic suppliers, about half expect, in return, prices that either remain unchanged or fall (for an improving or constant quality). Of the 44% of domestic firms that have supposedly received explicit help from their first MNC buyer, more than two-thirds said that the MNC expected in return either unchanged prices (for improving quality) or lower prices (for unchanged quality or even for better quality). Hence, even when deals with MNC lead to quality upgrades, both MNCs and domestic firms concur that MNCs expect prices to stay constant, if not decrease.

We also asked domestic firms about their pricing practices for the same order (i.e., the same product, quality, and quantity) made by either MNC or domestic buyers. 58% replied that they usually charge the same price to both types of buyers, with the other 42% split in half between whether they charge MNCs more or less. During the in-person surveys, we asked domestic firms if they had ever incurred losses from deals with MNCs. Most firms stated that they had made deals at a loss, particularly among the first MNC deals. To keep the MNC buyers content, suppliers are expected to absorb most of the unforeseen cost increases.

We then surveyed domestic firms about the changes that they experienced after their first supplying relationship with an MNC. 62% of the domestic respondents mentioned having expanded their product scope, in particular with higher-quality goods and services demanded by MNCs. These higher-quality products required firm-wide changes; for instance, introducing a quality management system. Also, higher-quality products require better inputs. This explains why 39% of suppliers had to change their sourcing strategy, 44% hired more high-

[34] In the words of the supply chain manager of one MNC: *"The biggest disadvantage of starting to work with us has to do with our "zero tolerance" policy. We are willing to help [suppliers], and we do help them, but cannot be a charitable benefactor forever and ever."* Interviews conducted by Alfaro and Rodríguez-Clare (2004) reveal similar patterns in which suppliers had improved their technologies because of the pressures exerted on them by MNCs.

skilled workers, and 27% had existing workers work harder. 50% of firms improved their managerial and organizational practices, in part advised by MNCs, in part prompted by pressure from MNCs to meet the agreed standards and to do so consistently.

A systematic pattern emerging from the surveys is that domestic firms implemented various interrelated changes upon becoming suppliers to MNCs. This experience of one domestic supplier is illustrative: *"The biggest change came with the expansion of the portfolio of goods and services we offered. [...] However, this change implied many others. One must be very agile in the organization of production, have inventories for very different inputs, improve financing, etc."*[35]

Finally, we were interested in how joining the supply chain of an MNC affected the supplier's business with buyers other than their first MNC buyer. Of the 44% of the domestic suppliers that claim having experienced changes in their business with domestic buyers, for most, the change involved selling more. The higher sales to domestic firms were first owed to a combination of selling higher or constant quality products at constant or falling prices. The higher visibility and better reputation in the domestic market (that follow from supplying to MNCs) also played a decisive role in their larger sales to domestic firms. The better reputation might, in part, explain why we find that sales to other buyers increased more on the extensive than on the intensive margin.

When asked whether it was also easier to sell to more MNC buyers after the first such buyer, 78% of domestic firms responded positively. Of these, 86% stated that it became easier to gain the trust of new MNCs. That said, earning a reputation does not automatically imply that this reputation is positive and helpful in selling to new (MNC) buyers. Domestic firms were motivated to learn and adapt quickly to the expectations of their first MNC buyers to avoid being classified as bad suppliers.[36] Other key drivers of the better prospects with other MNC buyers included expansions in product scope that accommodated specific MNC needs, enhanced productivity (for example, due to better managerial practices), and the higher-quality products sold at prices similar or lower than before the first MNC linkage.

Together with our regression-based findings, these survey-based findings suggest that disentangling the relative importance of the various effects of supplying to MNCs on domestic firms is not straightforward. First, such an endeavor would require data on rarely-measured product and firm characteristics (such as quality and reputation). Second, these effects are interrelated enough that only a controlled empirical setting would allow one to estimate their separate contributions credibly. For instance, successful expansions in product scope (typically with higher-quality products) tend to go hand in hand with higher efficiency so that firms can switch seamlessly between products requiring different inputs and processes. Moreover, the clear improvement in the ability to acquire new and "better" buyers suggests that first-time

[35] Based on four case studies of new exporting sectors in Argentina, Artopoulos et al. (2013) find that to export differentiated products successfully, domestic firms need to continuously integrate knowledge about foreign taste and business practices into their production processes. This finding on the interrelated nature of the effects of exporting to developed countries echoes our findings on the effects of supplying to MNCs.

[36] Not being known or trusted by MNCs was among the main reasons why suppliers struggled to get a first contract with MNCs. Moreover, MNCs believed that one of the biggest risks for suppliers was to be revealed as incapable of coping with their standards and for this to be shared with other potential clients, particularly other MNCs.

suppliers got a boost in reputation in the local market. This reputation boost is linked to the product characteristics that these domestic firms are revealed to be capable of supplying. Therefore, isolating these interrelated effects remains outside of the scope of this paper.

7 Conclusion

We use rich administrative data and an event-study design to show that first-time suppliers to an MNC experience strong and persistent gains in firm performance. Four years after joining the supply chain of an MNC, domestic firms employ 26% more workers and have a 4 to 9% higher TFP. We then exploit the fact that we observe all firm-to-firm sales of first-time suppliers, not only those to their first MNC buyer. In addition, we find persistent increases in sales to other (better-performing) buyers, explained mainly by an improved ability to acquire new buyers. Finally, we learn from our surveys that first-time suppliers benefit from wide-ranging improvements such as those to their managerial practices and reputation.

We highlight three directions for future research. First, as discussed at the end of the previous section, one of our main takeaways is that first-time suppliers to MNCs experience a series of interdependent improvements in efficiency, product scope, quality, and reputation. Estimating the magnitudes of each of these effects separately and their contributions to firm performance require even richer data than the one this project builds on and a controlled empirical environment (such as one provided by a randomized control trial).

Second, our evidence strongly suggests that markup increases do not explain our estimated TFP gains. However, without direct information on product characteristics, prices, and quantities, our evidence against markup increases is not definitive. Novel datasets that contain such information would open new possibilities to study what domestic firms sell and at which price upon joining the supply chain of an MNC.

Third, our placebo exercises show that the effects on the first-time suppliers to MNCs are not just demand effects; similarly-sized demand shocks from large domestic firms or domestic exporters do not generate as strong and persistent effects. However, we cannot definitively settle the extent to which our estimated effects are *entirely* owed to the buyer's MNC nature. This is because MNCs and large domestic firms (domestic exporters) might still differ along dimensions other than MNC status and size (exporter status) for which we control, dimensions that could be relevant for the effects (e.g., management practices). Nonetheless, the placebo exercises shed light on the unique effects of demand shocks from MNCs – at least in developing countries where non-MNC firms that are strictly comparable to MNCs are hard to find. Disentangling the precise role of the MNC status of a buyer relative to other correlated characteristics is a fruitful avenue for future work.

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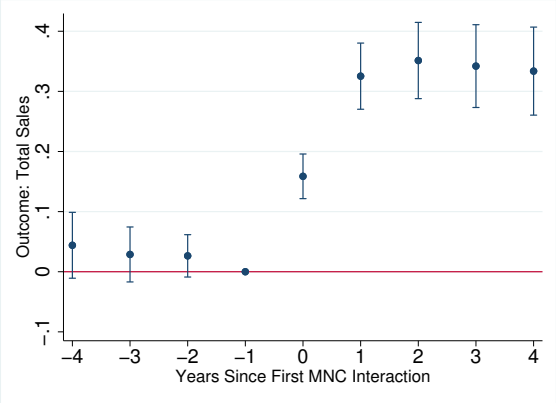
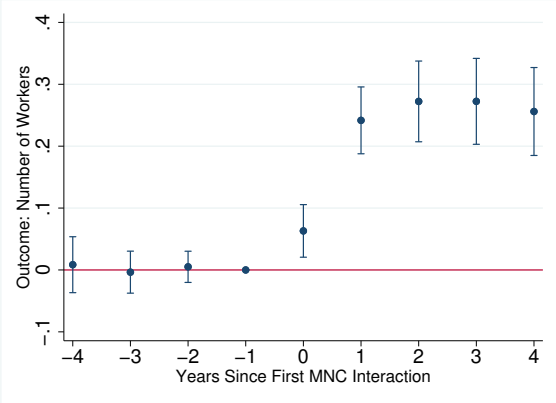
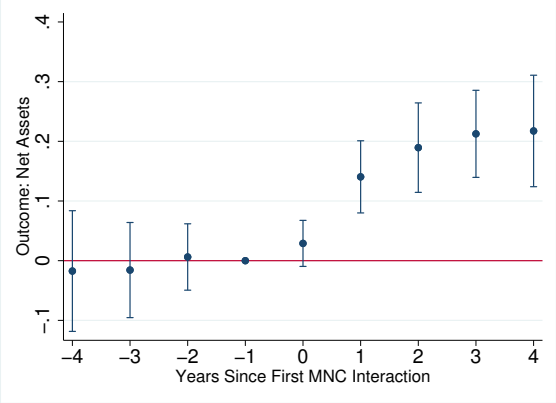
Figures



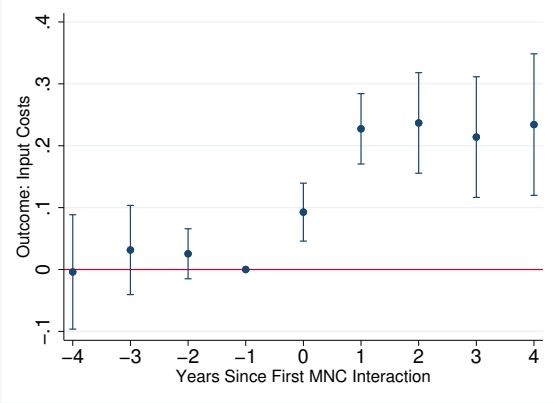
(a) Total Sales



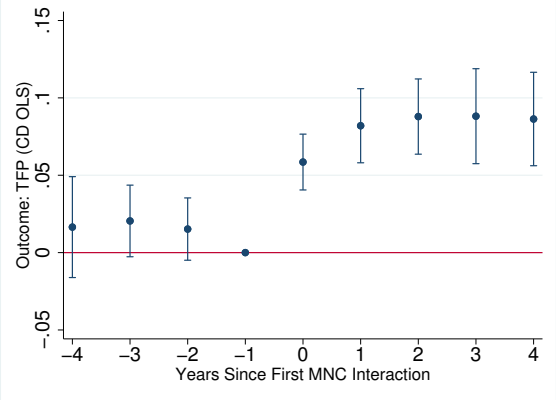
(b) Number of Workers



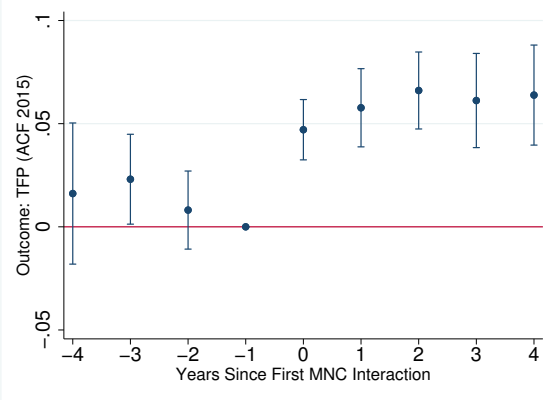
(c) Net Assets



(d) Input Costs



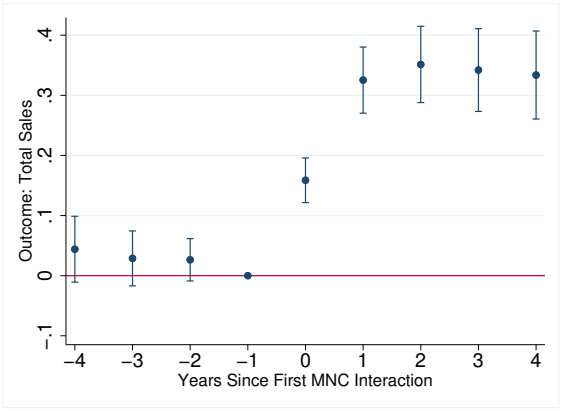
(e) TFP (Cobb–Douglas OLS)



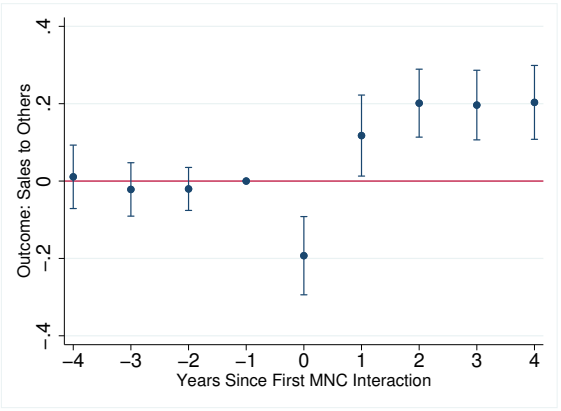
(f) TFP (Ackerberg et al., 2015)

Figure 1: Domestic Firms Increase Their Size and TFP after Starting to Supply to MNCs

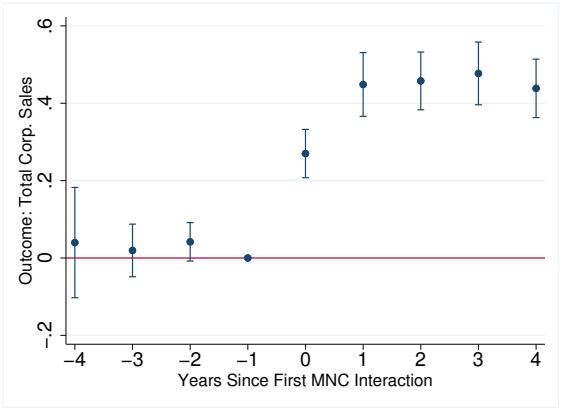
Notes: Figure 1 plots the estimated θ_k event-study coefficients from a regression of the form given in equation (1), where the dependent variable is, in turn, log total sales (panel 1a), log number of workers (panel 1b), log net assets (as a proxy for capital, panel 1c), and log input costs (as a proxy for materials, panel 1d). Panels 1e and 1f adapt specification (1) to two measures of TFP. Panel 1e uses a measure of TFP resulting from OLS production function estimation, under the Cobb–Douglas functional form assumption. Panel 1f estimates TFP using the method proposed by Ackerberg et al. (2015). The event is defined as a first time sale to an MNC. θ_{-1}, the coefficient of the year prior to a first sale to an MNC, is normalized to zero. All regressions include firm and four-digit sector × province × calendar year fixed effects. The vertical lines reflect the 95% confidence intervals. The coefficients plotted correspond to columns (1)-(5) and (8) in Table 1, obtained from the full sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC between 2008 and 2017.



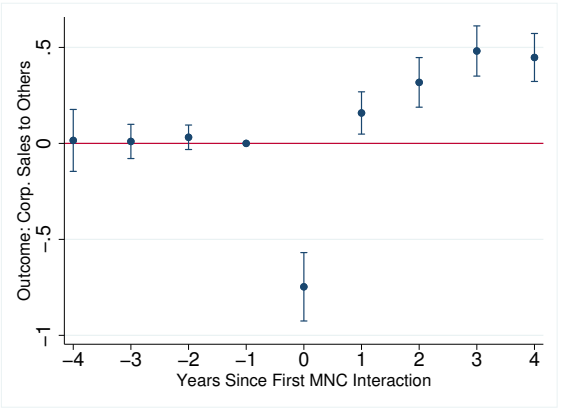
(a) Total Sales



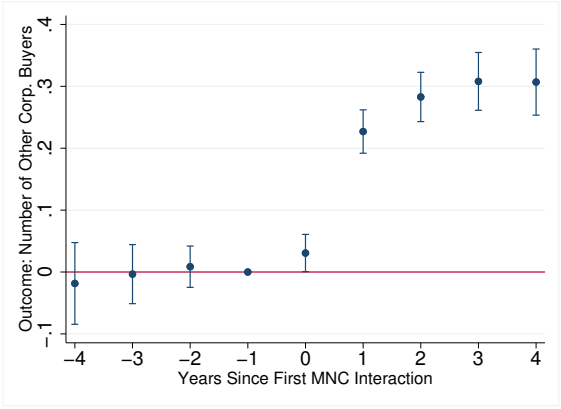
(b) Sales to Others



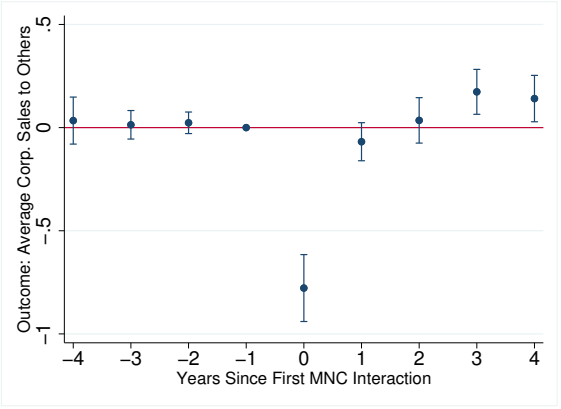
(c) Total Corporate Sales



(d) Corporate Sales to Others



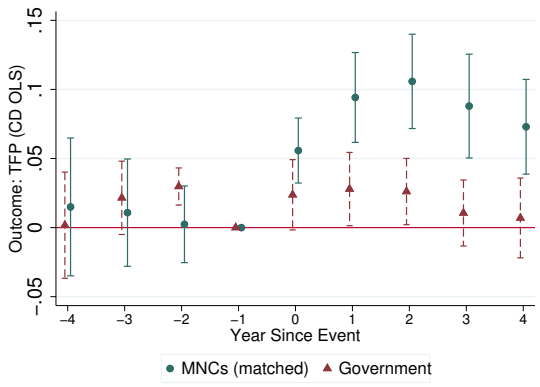
(e) Number of Other Corporate Buyers



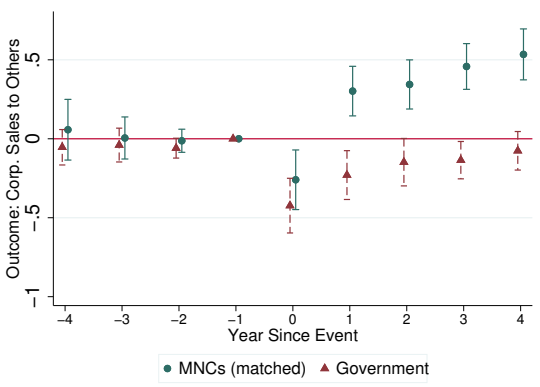
(f) Average Sales to Other Corporate Buyers

Figure 2: Domestic Firms Improve Their Sales to Others after Starting to Supply to MNCs

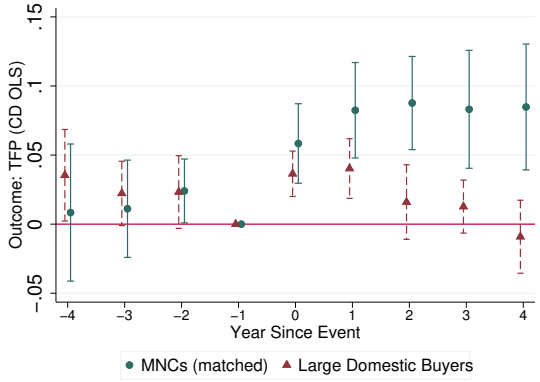
Notes: Figure 2 plots the estimated θ_k event-study coefficients from a regression of the form given in equation (1), where the dependent variable is, in turn, log total sales (panel 2a), log sales to buyers other than the first MNC buyer (panel 2b), log total sales to corporate buyers (panel 2c), log sales to corporate buyers other than the first MNC buyer (panel 2d), log number of other corporate buyers (panel 2e), and log average value of sales to other corporate buyers (panel 2f). The event is defined as a first time sale to an MNC. θ_{-1}, the coefficient of the year prior to a first sale to an MNC, is normalized to zero. All regressions include firm and four-digit sector $\times$ province $\times$ calendar year fixed effects. The vertical lines reflect the 95% confidence intervals. The coefficients plotted correspond to columns (1), (2), and (5)-(8) in Table 2, obtained from the sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC between 2008 and 2017.



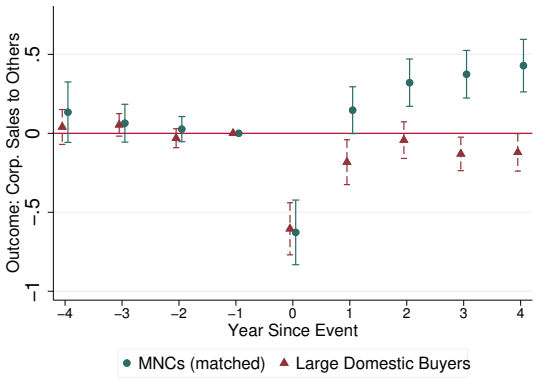
(a) Government, TFP (CD OLS)



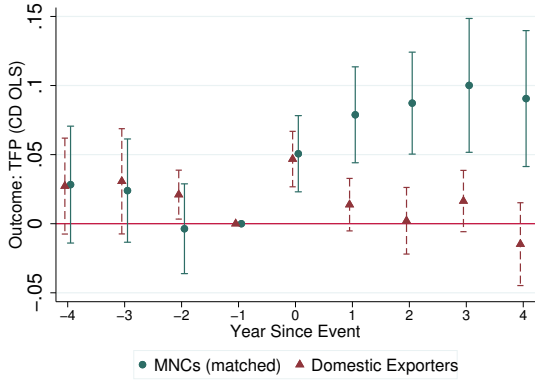
(b) Government, Corp Sales to Others



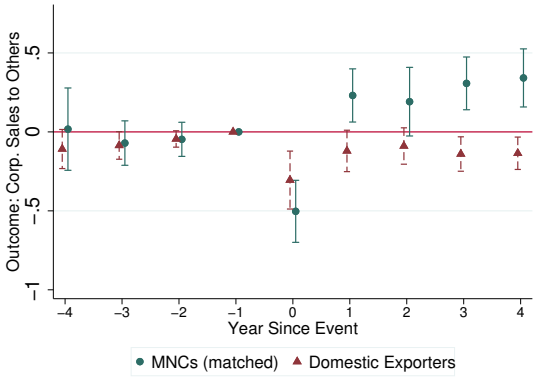
(c) Large Domestic Firm, TFP (CD OLS)



(d) Large Domestic Firm, Corp Sales to Others



(e) Domestic Exporter, TFP (CD OLS)



(f) Domestic Exporter, Corp Sales to Others

Figure 3: The Effects of Three Placebo Events – First-Time Supplying to the Government, Large Domestic Buyer, or Domestic Exporter – vs. the First-Time Supplying to an MNC Event

Notes: Figure 3 compares the effects of the event of starting to supply to an MNC with those from three other placebo events, namely starting to supply to (i) the Costa Rican government (panels 3a and 3b); (ii) a large domestic firm (panels 3c and 3d); and (iii) a domestic exporter (panels 3e and 3f). We show these effects for two outcomes variables: log TFP from an OLS production function estimation that assumes a Cobb–Douglas technology (left-hand side panels), and log corporate sales to others (right-hand side panels). The vertical lines reflect the 95% confidence intervals. For comparability, in each figure, we contrast the effects on the sample of first-time suppliers to the government, large domestic buyer, or domestic exporter to those on a matched subset from the baseline sample of first-time suppliers to MNCs. For example, to construct this subset for the government, we start from the sample of first-time suppliers to the government. Then, for each firm in that sample, we identify the best match in the baseline sample of first-time suppliers to MNCs (where the matching is based on the similarity in supplier characteristics and the demand shock received during the corresponding event). For details, see Section 5.1 and Online Appendix E.2.

Tables

Table 1: Domestic Firms Increase Their Size and TFP after Starting to Supply to MNCs

	Firm Size				TFP				
	Total Sales (1)	Number Workers (2)	Net Assets (3)	Input Costs (4)	CD OLS (5)	TL OLS (6)	LP (2003) (7)	ACF (2015) (8)	DL* (2013) (9)
4 years before event	0.044	0.009	-0.017	-0.004	0.016	0.015	0.020	0.016	-0.027**
	(0.028)	(0.023)	(0.052)	(0.047)	(0.017)	(0.016)	(0.018)	(0.017)	(0.014)
3 years before event	0.029	-0.004	-0.016	0.032	0.020*	0.019*	0.028**	0.023**	-0.016*
	(0.023)	(0.017)	(0.041)	(0.037)	(0.012)	(0.010)	(0.011)	(0.011)	(0.009)
2 years before event	0.026	0.005	0.006	0.025	0.015	0.007	0.011	0.008	-0.002
	(0.018)	(0.013)	(0.028)	(0.021)	(0.010)	(0.009)	(0.010)	(0.010)	(0.005)
Year of event	0.159***	0.063***	0.029	0.093***	0.059***	0.044***	0.061***	0.047***	0.004
	(0.019)	(0.022)	(0.020)	(0.024)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)
1 year after event	0.325***	0.242***	0.140***	0.227***	0.082***	0.057***	0.067***	0.058***	0.020***
	(0.028)	(0.028)	(0.031)	(0.029)	(0.012)	(0.011)	(0.011)	(0.010)	(0.007)
2 years after event	0.351***	0.272***	0.189***	0.237***	0.088***	0.067***	0.078***	0.066***	0.025***
	(0.032)	(0.033)	(0.038)	(0.041)	(0.012)	(0.012)	(0.010)	(0.010)	(0.007)
3 years after event	0.342***	0.272***	0.213***	0.214***	0.088***	0.064***	0.074***	0.061***	0.031***
	(0.035)	(0.035)	(0.037)	(0.050)	(0.016)	(0.014)	(0.012)	(0.012)	(0.010)
4 years after event	0.334***	0.256***	0.217***	0.234***	0.086***	0.066***	0.076***	0.064***	0.042***
	(0.037)	(0.036)	(0.048)	(0.058)	(0.015)	(0.015)	(0.013)	(0.012)	(0.011)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var. (level)	0.85	13.2	2.93	0.78	1.12	1.12	-0.00	-0.00	1.51
SD Dep. Var. (level)	2.54	32.6	712.8	2.68	3.17	3.17	0.37	0.35	0.33
Adjusted R^2	0.77	0.74	0.81	0.83	0.95	0.97	0.63	0.62	0.87
# Observations	116,683	116,683	94,038	67,194	64,419	64,419	64,419	64,419	64,419
# Fixed Effects	25,174	25,174	21,480	15,894	15,464	15,464	15,464	15,464	15,464
# Firms	18,035	18,035	14,804	10,834	10,492	10,492	10,492	10,492	10,492

Notes: Table 1 shows the results of running the event-study specification (1), where the event is defined as a first time sale to an MNC. The first four dependent variables are measures of firm size: log total sales (column (1)), log total number of workers (column (2)), log net assets (as a proxy for capital, column (3)), and log input costs (as a proxy for materials, column (4)). Columns (5)-(9) propose various proxies of TFP as an outcome variable. Column (5) uses a measure of TFP resulting from an OLS production function estimation that assumes a Cobb–Douglas technology, with revenues (CPI-deflated to 2013 U.S. dollars) as the output measure and total net assets, number of workers, and input costs as input measures for K, L, and M respectively. Column (6) differs from column (5) only in its assumption of a translog functional form. For both Cobb–Douglas and translog, we estimate the coefficients on factors of production over the entire sample of domestic firms, controlling for narrowly defined fixed effects. Column (7) shows the results of production function estimation following Levinsohn and Petrin (2003). Column (8) shows the results of production function estimation following Ackerberg et al. (2015). In column (9), we adapt the TFP estimation procedure from De Loecker (2013) such that the endogenous productivity process that is accommodated by this procedure is no longer learning by exporting, but learning from supplying to an MNC. θ_{-1}, the coefficient of the year prior to a first sale to an MNC, is normalized to zero. All columns report-event study estimates for the sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC between 2008 and 2017. With the exception of the number of workers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Clustering of standard errors is at the two-digit sector by province level. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2: Domestic Firms Improve Their Business With Others after Starting to Supply to MNCs

	Total Sales	Sales to Others	Sales to Others Robust 1	Sales to Others Robust 2	Total Corp. Sales	Corp. Sales to Others	Number Other Corp. Buyers	Average Corp. Sales to Others
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4 years before event	0.044	0.011	0.014	0.028	0.040	0.016	-0.018	0.034
	(0.028)	(0.042)	(0.042)	(0.040)	(0.073)	(0.082)	(0.034)	(0.058)
3 years before event	0.029	-0.022	-0.021	-0.009	0.020	0.010	-0.003	0.014
	(0.023)	(0.035)	(0.036)	(0.038)	(0.035)	(0.045)	(0.024)	(0.035)
2 years before event	0.026	-0.020	-0.021	-0.029	0.042	0.032	0.009	0.023
	(0.018)	(0.028)	(0.029)	(0.035)	(0.025)	(0.033)	(0.017)	(0.027)
Year of event	0.159***	-0.193***	-0.189***	-0.217***	0.270***	-0.747***	0.031**	-0.778***
	(0.019)	(0.052)	(0.051)	(0.052)	(0.032)	(0.091)	(0.015)	(0.083)
1 year after event	0.325***	0.118**	0.122**	0.115**	0.448***	0.159***	0.227***	-0.068
	(0.028)	(0.053)	(0.052)	(0.052)	(0.042)	(0.056)	(0.018)	(0.047)
2 years after event	0.351***	0.201***	0.199***	0.212***	0.458***	0.318***	0.283***	0.035
	(0.032)	(0.045)	(0.049)	(0.050)	(0.038)	(0.066)	(0.020)	(0.056)
3 years after event	0.342***	0.196***	0.203***	0.219***	0.477***	0.481***	0.308***	0.173***
	(0.035)	(0.046)	(0.044)	(0.050)	(0.041)	(0.067)	(0.024)	(0.056)
4 years after event	0.334***	0.203***	0.204***	0.201***	0.438***	0.448***	0.307***	0.141**
	(0.037)	(0.049)	(0.048)	(0.056)	(0.039)	(0.064)	(0.027)	(0.057)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var. (level)	0.85	0.84	0.84	0.81	0.39	0.37	12.8	0.038
SD Dep. Var. (level)	2.54	2.54	2.52	2.49	1.20	1.21	38.6	0.056
Adjusted R^2	0.77	0.70	0.69	0.65	0.75	0.63	0.84	0.57
# Observations	116,683	116,536	116,444	115,879	63,793	63,078	63,078	63,078
# Fixed Effects	25,174	25,156	25,150	25,088	16,833	16,689	16,689	16,689
# Firms	18,035	18,024	18,019	17,977	10,985	10,895	10,895	10,895

Notes: Table 2 shows the results of running the event-study specification (1) adapted to eight dependent variables: log total sales (across all buyers, *including* the first MNC buyer, column (1)), log sales to others (all buyers *except* the first MNC buyer, column (2)), log sales to others "Robust 1" (across all buyers *except* the first MNC buyer *and* other first-time suppliers to MNCs, column (3)), log sales to others "Robust 2" (across all buyers *except* the first MNC buyer *and* other buyers that supply at some point to MNCs themselves, column (4)), log total sales to corporate buyers (*including* the first MNC buyer, column (5)), log sales to other corporate buyers (all corporate buyers *except* the first MNC buyer, column (6)), log number of other corporate buyers + 1 (number of corporate buyers tracked by the firm-to-firm transaction data, *except* the first MNC buyer, + 1, column (7)), and log average sales to other corporate buyers (total sales to other corporate buyers, divided by the number of other corporate buyers, *except* the first MNC buyer, +1, column (8)). The event is defined as a first time sale to an MNC. θ_{-1}, the coefficient of the year prior to a first sale to an MNC, is normalized to zero. All columns pertain to the full sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC between 2008 and 2017. Clustering of standard errors is at the two-digit sector by province level. All regressions include firm and four-digit sector $\times$ province $\times$ calendar year fixed effects. Except for the number of buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: Baseline Event-Study Estimates Are Robust to Four Alternative Empirical Strategies

	"Productive Linkages" Design			Predicted Procomer Score			Propensity Score Matching			Nearest Neighbors Matching		
	Total Sales	TFP CD OLS	Corp. Sales to Others	Total Sales	TFP CD OLS	Corp. Sales to Others	Total Sales	TFP CD OLS	Corp. Sales to Others	Total Sales	TFP CD OLS	Corp. Sales to Others
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.133	-0.004	-0.019	0.114***	0.017	0.045	0.135***	0.038**	0.090	-0.026	0.003	0.008
	(0.212)	(0.127)	(0.229)	(0.036)	(0.015)	(0.086)	(0.030)	(0.017)	(0.092)	[-0.098,0.107]	[-0.041,0.065]	[-0.181,0.279]
3 years before event	0.128	0.152	0.009	0.090***	0.026	0.065	0.092***	0.023	0.130**	-0.023	0.000	-0.017
	(0.172)	(0.139)	(0.251)	(0.032)	(0.018)	(0.058)	(0.025)	(0.013)	(0.061)	[-0.087,0.076]	[-0.035,0.041]	[-0.164,0.149]
2 years before event	0.019	0.112	-0.075	0.057**	0.019**	0.059	0.069***	0.028**	0.088**	-0.011	-0.003	-0.041
	(0.150)	(0.122)	(0.192)	(0.024)	(0.009)	(0.037)	(0.021)	(0.013)	(0.042)	[-0.046,0.056]	[-0.028,0.028]	[-0.134,0.067]
Year of event	0.182	0.131	0.008	0.153***	0.051***	-0.699***	0.095***	0.040***	-0.763***	0.165***	0.029***	-1.285***
	(0.167)	(0.140)	(0.193)	(0.019)	(0.010)	(0.067)	(0.023)	(0.012)	(0.064)	[0.111,0.218]	[0.013,0.064]	[-1.694,-1.091]
1 year after event	0.335**	0.279***	0.088	0.301***	0.077***	0.179***	0.184***	0.063***	0.085*	0.338***	0.055***	0.049
	(0.140)	(0.106)	(0.189)	(0.028)	(0.014)	(0.057)	(0.023)	(0.015)	(0.045)	[0.284,0.398]	[0.031,0.092]	[-0.199,0.177]
2 years after event	0.370**	0.218**	0.359**	0.362***	0.095***	0.345***	0.238***	0.069***	0.229***	0.392***	0.064***	0.227*
	(0.159)	(0.108)	(0.176)	(0.030)	(0.011)	(0.072)	(0.022)	(0.015)	(0.063)	[0.330,0.461]	[0.039,0.104]	[-0.031,0.351]
3 years after event	0.358**	0.203*	0.120	0.397***	0.099***	0.517***	0.256***	0.077***	0.413***	0.425***	0.067***	0.337***
	(0.153)	(0.116)	(0.191)	(0.036)	(0.011)	(0.078)	(0.026)	(0.016)	(0.080)	[0.351,0.503]	[0.035,0.109]	[0.120,0.472]
4 years after event	0.389**	0.225**	0.141	0.427***	0.100***	0.499***	0.293***	0.089***	0.385***	0.476***	0.063***	0.372***
	(0.165)	(0.114)	(0.201)	(0.041)	(0.016)	(0.061)	(0.029)	(0.018)	(0.065)	[0.395,0.557]	[0.026,0.113]	[0.126,0.540]
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Year FE	Yes	Yes	Yes	No	No	No	No	No	No	n/a	n/a	n/a
Year-4DSect-Prov FE	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Adjusted R^2	0.83	0.96	0.81	0.80	0.96	0.68	0.82	0.97	0.69	n/a	n/a	n/a
# Observations	1,111	1,087	1,072	107,135	55,208	71,083	98,393	53,693	70,903	91,382	46,883	71,776
# Fixed Effects	123	123	123	15,470	10,026	12,540	14,888	9,720	12,275	n/a	n/a	n/a
# Treated	31	31	31	3,606	2,248	3,383	3,599	2,247	3,380	3,670	2,024	3,254
# Control	84	84	84	10,814	6,297	8,096	10,811	6,598	8,632	11,010	6,072	9,762

Notes: Table 3 contains robustness checks to the baseline results reported in Tables 1 and 2. These exercises employ the four alternative empirical strategies described in Section 3.2, each for three outcomes (all in logs): total sales, TFP residual from an OLS regression that assumes a Cobb–Douglas technology and corporate sales to others. Columns (1) to (3) present the results from the "Productive Linkages" design, columns (4) to (6) those from the "predicted Procomer scores" matching, columns (7) to (9) those from the propensity score matching, and columns (10) to (12) those from the nearest neighbors matching. Due to missing values in the input costs (materials) variable for its small sample, the "Productive Linkages" OLS production function estimation considers only workers and net assets (as a proxy for capital) as inputs. The three matching variables also control for materials usage. Regressions in columns (1) to (3) include firm, deal, and year fixed effects. Regressions in columns (4) to (12) include firm and four-digit sector × province × calendar year fixed effects. For columns (1) to (9), robust standard errors are in parentheses. For the nearest neighbors matching, 95 percent confidence intervals, given in brackets and statistical significance levels are constructed via subsampling. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: First-Time Suppliers to MNCs Start Selling to More Buying Sectors. Moreover, First-Time Suppliers Shift their Sales Towards Buyers with Better Performance

	Number of buying/supplying sectors				Average characteristics of the buyers (excluding the first MNC buyer)							
	# 2D Buying Sectors	# 2D Supplying Sectors	# 4D Buying Sectors	# 4D Supplying Sectors	Number Workers	Total Sales	Number Suppliers	Number Buyers	Export Share	Import Share	Trans / Supplier	Length w/ Suppliers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	-0.024	0.000	-0.018	-0.018	0.019	0.017	-0.012	-0.108	-0.007	-0.005	-0.018	0.015
	(0.026)	(0.021)	(0.029)	(0.026)	(0.075)	(0.078)	(0.052)	(0.084)	(0.005)	(0.006)	(0.038)	(0.034)
3 years before event	-0.003	-0.006	0.003	-0.009	-0.063	-0.108**	-0.056	-0.006	-0.005	0.002	-0.039	-0.028
	(0.018)	(0.016)	(0.021)	(0.016)	(0.055)	(0.050)	(0.043)	(0.050)	(0.004)	(0.006)	(0.029)	(0.030)
2 years before event	0.008	0.008	0.017	-0.002	-0.021	-0.036	-0.015	0.068	0.001	-0.001	-0.001	0.016
	(0.019)	(0.013)	(0.019)	(0.013)	(0.031)	(0.036)	(0.029)	(0.047)	(0.002)	(0.004)	(0.019)	(0.020)
Year of event	0.032***	-0.002	0.040***	-0.008	0.088*	0.085*	0.074**	0.076	-0.003	-0.008**	0.019	0.016
	(0.012)	(0.011)	(0.011)	(0.010)	(0.044)	(0.045)	(0.033)	(0.050)	(0.002)	(0.003)	(0.016)	(0.016)
1 year after event	0.125***	0.012	0.145***	0.010	0.362***	0.402***	0.241***	0.328***	0.011***	0.014***	0.081***	0.037**
	(0.014)	(0.013)	(0.013)	(0.014)	(0.050)	(0.051)	(0.038)	(0.053)	(0.003)	(0.004)	(0.019)	(0.017)
2 years after event	0.154***	0.023	0.182***	0.024	0.445***	0.498***	0.293***	0.415***	0.015***	0.015***	0.127***	0.062***
	(0.015)	(0.017)	(0.015)	(0.017)	(0.043)	(0.041)	(0.033)	(0.048)	(0.003)	(0.004)	(0.020)	(0.021)
3 years after event	0.175***	0.025	0.205***	0.026*	0.475***	0.541***	0.306***	0.468***	0.017***	0.017***	0.152***	0.079***
	(0.016)	(0.015)	(0.017)	(0.016)	(0.049)	(0.048)	(0.037)	(0.057)	(0.003)	(0.004)	(0.021)	(0.021)
4 years after event	0.175***	0.030	0.208***	0.030	0.487***	0.534***	0.301***	0.399***	0.012***	0.017***	0.190***	0.081***
	(0.020)	(0.019)	(0.021)	(0.020)	(0.054)	(0.055)	(0.043)	(0.051)	(0.004)	(0.006)	(0.020)	(0.024)
Mean Dep. Var. (level)	3.67	4.56	4.52	6.04	456.0	74.0	172.4	428.8	0.049	0.10	0.036	3.69
SD Dep. Var. (level)	3.25	3.86	4.88	6.37	1434.6	269.2	417.1	1788.1	0.15	0.17	0.032	2.51
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.78	0.83	0.81	0.86	0.73	0.74	0.74	0.74	0.77	0.70	0.64	0.72
# Observations	54,363	54,363	54,363	54,363	54,363	54,363	54,363	54,363	54,363	54,363	54,363	54,363
# Fixed Effects	14,998	14,998	14,998	14,998	14,998	14,998	14,998	14,998	14,998	14,998	14,998	14,998
# Firms	9,652	9,652	9,652	9,652	9,652	9,652	9,652	9,652	9,652	9,652	9,652	9,652

Notes: Table 4 shows the results of running the event-study specification (1) for twelve outcomes. We define the event as a first time sale to an MNC. Columns (1) and (3) (columns (2) and (4)) study the effect of the event on the log number of two-digit and four-digit buying sectors of (supplying sectors to) the first-time suppliers. For each domestic firm and regression, there is only one observation: the unweighted count of its number of buying (supplying) sectors in that event year. Columns (5) to (12) study the effect of the event on the characteristics of the buyers of first-time suppliers. We first compute the variable in question for each buyer (e.g., its number of suppliers for column (9)). Then, for each domestic firm, we compute a weighted average of the values of the variable across its buyers in that event year, where the weights reflect the importance of each buyer to the domestic firm that year (measured as a share of the value of transactions with that buyer out of the total value of the transactions of the domestic firm). The final outcome is the log weighted average. In order, columns (5) to (12) study the following *buyer characteristics*: the number of workers, total sales, number of suppliers, number of buyers, the share of exports in total sales, the share of imports in total input costs (imports plus local purchases), the average transaction value across all the suppliers of the buyer, the average length of the relationships of the buyer with all its suppliers (this last variable is the only one computed across all years; all other variables are in the event year). The MNC buyer triggering the event is always excluded from the set of buyers described in this table. All regressions control for the contemporaneous log total sales of the first-time supplier, in addition to firm and four-digit sector $\times$ province $\times$ calendar year fixed effects. All columns pertain to the full sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC during our entire firm-to-firm transaction dataset. Clustering of standard errors is at the two-digit sector by province level. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: First-Time Suppliers to MNCs Have a Steep (Closer to Flat) Short-Run (Medium-Run) Marginal Cost Curve

	Baseline Sales to others		Robustness check Transactions with others	
	δ	$\gamma = \frac{\delta}{\delta+\sigma-1}$	δ	$\gamma = \frac{\delta}{\delta+\sigma-1}$
	(1)	(2)	(3)	(4)
Year of event	-2.702***	2.034	-3.553***	7.455
	(0.550)	(1.255)	(0.570)	(10.120)
1 year after event	-0.654***	0.194***	-0.419***	0.116**
	(0.158)	(0.056)	(0.153)	(0.047)
2 years after event	-0.435***	0.121***	-0.128	0.033
	(0.120)	(0.038)	(0.164)	(0.043)
3 years after event	-0.464***	0.130***	0.191	-0.045
	(0.156)	(0.049)	(0.165)	(0.037)
4 years after event	-0.433**	0.120**	0.159	-0.038
	(0.169)	(0.053)	(0.171)	(0.039)
# Observations	116,683	116,683	63,793	63,793

Notes: Table 5 shows the estimates of δ (the parameter that governs the interdependence between the change in total sales of firm i and its change in sales to others) and the marginal cost elasticity $\gamma = -\delta/(\delta + \sigma - 1)$. Their estimation is based on equation (5). For these estimates, we set $\sigma = 5.03$, which we infer from the average markup in the economy using the methodology of De Loecker and Warzynski (2012). Columns (1) and (2) include the estimates of δ and γ when we use the total sales and sales to others constructed from the corporate income tax returns. The estimates in columns (1) and (2) are our preferred estimates. Columns (3) and (4) replace the total sales by the total corporate sales and the sales to others by the corporate sales to others (where "corporate" is used only for sales that are traced in the firm-to-firm transaction data). We obtain standard errors for our estimates of δ using a bootstrap procedure. Since γ is a function of δ, we then apply the delta method to obtain standard errors for our estimates of γ. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: TFP Gains Vary by the Sector of the Domestic Firm or the First MNC Buyer

	Sector of the domestic first-time supplier to an MNC								Sector of the first MNC buyer			
	Full sample				Restricted sample				Restricted sample			
	MFG (1)	RET (2)	SER (3)	AGR (4)	MFG (5)	RET (6)	SER (7)	AGR (8)	MFG (9)	RET (10)	SER (11)	AGR (12)
4 years before event	-0.03	0.02	-0.03	0.09	-0.01	-0.00	-0.11	0.08	0.00	-0.03	-0.05	0.14
	(0.04)	(0.02)	(0.04)	(0.06)	(0.07)	(0.03)	(0.08)	(0.13)	(0.04)	(0.07)	(0.06)	(0.10)
3 years before event	-0.02	0.02	-0.01	0.01	-0.00	0.00	-0.08	0.01	-0.05	0.02	-0.02	0.14*
	(0.03)	(0.01)	(0.03)	(0.05)	(0.04)	(0.02)	(0.06)	(0.09)	(0.03)	(0.05)	(0.04)	(0.07)
2 years before event	0.00	0.03**	-0.03	0.01	0.02	0.02	-0.05	-0.00	0.01	0.03	0.01	0.09*
	(0.03)	(0.01)	(0.03)	(0.05)	(0.03)	(0.01)	(0.04)	(0.06)	(0.02)	(0.03)	(0.02)	(0.05)
Year of event	0.07***	0.05***	0.06***	0.01	0.09***	0.06***	0.08**	0.01	0.09***	0.03	0.05**	0.02
	(0.02)	(0.01)	(0.02)	(0.04)	(0.03)	(0.01)	(0.03)	(0.05)	(0.02)	(0.03)	(0.02)	(0.05)
1 year after event	0.12***	0.06***	0.08***	-0.01	0.15***	0.07***	0.13***	0.01	0.12***	0.07	0.09***	-0.06
	(0.02)	(0.01)	(0.02)	(0.04)	(0.05)	(0.02)	(0.05)	(0.08)	(0.03)	(0.05)	(0.04)	(0.07)
2 years after event	0.11***	0.07***	0.08***	-0.01	0.13**	0.08***	0.16**	0.01	0.12***	0.09	0.12**	-0.08
	(0.02)	(0.01)	(0.02)	(0.04)	(0.06)	(0.03)	(0.07)	(0.12)	(0.04)	(0.06)	(0.05)	(0.09)
3 years after event	0.09***	0.06***	0.08***	-0.01	0.11	0.08**	0.19**	0.01	0.14***	0.09	0.12*	-0.12
	(0.02)	(0.01)	(0.02)	(0.05)	(0.08)	(0.04)	(0.09)	(0.15)	(0.05)	(0.08)	(0.06)	(0.11)
4 years after event	0.12***	0.06***	0.05**	0.05	0.14	0.08*	0.18*	0.03	0.14**	0.07	0.14*	-0.09
	(0.03)	(0.01)	(0.03)	(0.05)	(0.09)	(0.04)	(0.11)	(0.19)	(0.06)	(0.10)	(0.08)	(0.13)
Mean Dep. Var. (level)	1.12	1.30	0.80	1.05	2.15	2.10	1.52	1.96	1.76	1.75	1.68	3.66
SD Dep. Var. (level)	4.27	2.84	3.21	2.25	7.56	4.42	6.08	4.10	3.67	3.95	4.39	9.89
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-2DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Adjusted R^2	0.96	0.97	0.92	0.91	0.97	0.97	0.94	0.95	0.96	0.96	0.96	0.98
# Observations	9,806	33,550	17,998	4,929	2,792	7,836	3,822	1,039	5,904	2,920	4,489	837
# Fixed Effects	2,076	5,374	4,498	894	910	1,306	1,340	246	1,797	957	1,407	314
# Firms	1,424	5,164	3,389	788	396	1,099	722	161	923	451	716	120

Notes: Table 6 presents the heterogeneity of TFP gains by the sector of either the first-time supplier or the sector of the first MNC buyer triggering the event. All columns report results from running the event-study specification (1) adapted to the Cobb–Douglas OLS measure of TFP. Regressions differ in the sample over which the regression is run. Columns (1) to (8) separate firms based on the sector of the domestic firm. The four largest sectoral groups are manufacturing (MFG), retail (including repair and maintenance, RET), services (SER), and agriculture (AGR). Columns (9) to (12) separate firms based on the sector of the first MNC buyer. Note that this latter separation can only be done in the restricted sample containing only first-time suppliers, as never-suppliers do not have a first MNC buyer. Columns (1) to (4) pertain to the full sample including both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC between 2008 and 2017. Columns (5) to (12) focus only on the restricted sample of first-time suppliers. All regressions include firm and two-digit sector $\times$ province $\times$ calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: TFP Gains Vary by the Importance of the First Transaction

	Median I-O share		I-O share larger than			Median first trans.	
	Below	Above	1%	5%	10%	Below	Above
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
4 years before event	0.01	-0.03	-0.03	-0.14	-0.21	0.02	-0.05
	(0.04)	(0.04)	(0.05)	(0.10)	(0.14)	(0.03)	(0.05)
3 years before event	0.02	-0.03	-0.04	-0.10	-0.12	0.01	-0.05
	(0.03)	(0.03)	(0.03)	(0.06)	(0.08)	(0.02)	(0.04)
2 years before event	0.02	0.01	0.01	-0.07*	-0.04	0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.01)	(0.03)
Year of event	0.06***	0.06***	0.07***	0.08**	0.09*	0.02	0.11***
	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.01)	(0.02)
1 year after event	0.08***	0.11***	0.12***	0.20***	0.17**	0.05**	0.15***
	(0.03)	(0.03)	(0.03)	(0.06)	(0.08)	(0.02)	(0.04)
2 years after event	0.07**	0.12***	0.13***	0.23***	0.24**	0.05*	0.16***
	(0.03)	(0.04)	(0.04)	(0.08)	(0.11)	(0.03)	(0.05)
3 years after event	0.08*	0.14***	0.15***	0.28***	0.28*	0.05	0.18***
	(0.04)	(0.05)	(0.05)	(0.11)	(0.15)	(0.04)	(0.06)
4 years after event	0.07	0.15**	0.17**	0.35***	0.37**	0.05	0.18**
	(0.05)	(0.06)	(0.07)	(0.13)	(0.18)	(0.05)	(0.08)
Mean Dep. Var. (level)	1.75	2.22	2.18	2.16	2.49	1.63	2.49
SD Dep. Var. (level)	5.44	5.68	5.48	3.19	3.63	4.47	6.73
Adjusted R^2	0.96	0.96	0.96	0.95	0.97	0.97	0.96
# Observations	7,810	7,189	6,733	2,188	1,030	8,692	6,173
# Fixed Effects	2,319	1,861	1,761	662	326	2,231	1,946
# Firms	1,196	1,112	1,037	331	149	1,243	1,046

Notes: Table 7 presents the heterogeneity of TFP gains by the importance of the first transaction to both the supplier and the buyer. All columns report results from running the event-study specification (1) adapted to the Cobb–Douglas OLS measure of TFP. All columns start from the restricted sample of first-time suppliers. Columns differ in the subsample over which the regression is run. Columns (1) to (5) show the heterogeneity of the TFP gains based on how core the sector of the first-time supplier is to the sector of their first MNC buyer. We start from the firm-to-firm transaction data and aggregate the transactions up to the buying-sector by selling-sector pair. We then compute the I-O shares that each buying-sector purchases from each selling-sector out of the total purchases of the buying-sector. Columns (1) and (2) separate first-time suppliers into those with an I-O share below or above the median I-O share (across all first-time suppliers). The higher the I-O share, the more the first-time supplier sells an input that is more "core" to the production of its first MNC buyer. Columns (3), (4), and (5) keep only the first-time suppliers whose sector sells more than 1%, 5%, and 10% (respectively) to the sector of the first MNC buyer. Columns (6) and (7) separate domestic firms based on the amount of their transaction with the MNC buyer that triggered their first-time supplying event. If a domestic firm supplies to more than one MNC in the year of its event, we assign the amount of the largest transaction with an MNC that year. We then compute the median (across all first-time suppliers) of the amount of the first transaction with an MNC and split suppliers by whether their first transaction was below or above this median. All regressions include firm and two-digit sector × province × calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

The Effects of Joining Multinational Supply Chains: New Evidence from Firm-to-Firm Linkages

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Appendices for Online Publication

These appendices supplement the paper "The Effects of Joining Multinational Supply Chains: New Evidence from Firm-to-Firm Linkages" with the following material:

- Online Appendix A describes in detail the administrative data and Procomer "Productive Linkages" data. In particular, we present the sample construction rules for each data source and descriptive statistics. The subsection on "Productive Linkages" also provides context on the program itself.

- Online Appendix B includes summary statistics on the baseline economy-wide event-study sample, namely, on the domestic firms that become suppliers to MNCs, on the MNCs triggering these events, and on the events themselves.

- Online Appendix C mainly contains additional evidence using the baseline economy-wide event-study sample and methodology (e.g., evidence on markups, the composition of sales, effects after a second or third event, a heterogeneity analysis).

- Online Appendix D contains supplemental robustness checks on the baseline event-study estimates (e.g., robustness to excluding suppliers hiring new managers or former MNC workers, or to different sample selection criteria).

- Online Appendix E includes various exercises that help us shed light on the interpretation of our baseline results.

  - Online Appendix E.1 provides evidence on the ability of changes in "backward linkages" to MNCs to explain changes in firm-level TFP – by the level of disaggregation of the "backward linkages" variable.
  - Online Appendix E.2 includes descriptive statistics and additional estimates for three placebo event studies (in which we define the event as a first sale to the Costa Rican government, a large domestic firm, or a domestic exporter, respectively).
  - Online Appendix E.3 presents detailed derivations of our model and estimates of the returns to scale, markups, the elasticity of demand; it also contains additional estimates of the marginal cost elasticity.
  - Online Appendix E.4 brings evidence that the baseline event-study results are not driven by changes in tax evasion behaviors (neither in third-party reporting of transactions nor the reporting of workers).

- Online Appendix F describes the survey design, implementation, response rate, representativeness, questions and answers received.

Online Appendix A Data Construction and Statistics

Online Appendix A.1 Administrative Data

All the administrative data described hereafter is confidential and could only be stored and accessed in person in a fully-secured location at the Central Bank of CR (BCCR).

Online Appendix A.1.1 Corporate Income Tax Returns and Social Security Data

Our first administrative dataset contains the universe of corporate income tax returns of formal active firms over the 2008 to 2017 period. Firms are corporations or individuals conducting business in CR. Every firm must file yearly tax declarations called D-101 (*"Declaración Jurada del Impuesto Sobre la Renta"* or the "Affidavit of Income Tax") to the Ministry of Finance. This form contains information on typical balance sheet variables such as total sales, total net assets, total costs, profits. The total net assets are the sum of cash and other liquid assets, shares/stocks, inventories, and total fixed assets. Total costs are broken down into administrative costs, material inputs, capital depreciation, interest payments, and other costs. Not filing the D-101 on time leads to payments of fines of up to 385 U.S. dollars, plus 11 to 12% annual interest on the firm's income tax liability.

We use the firm tax ID to merge the corporate income tax returns data with matched employer-employee data (MEED) from the Costa Rican Social Security Fund (*"Caja Costarricense del Seguro Social"*). In the main analysis, we use two variables from the MEED: the number of employees and the total wage bill. All tax IDs that report to the Social Security at some point between 2008 and 2017 are considered active and kept for analysis. In the robustness checks and interpretation sections, we leverage the full richness of the MEED (for instance, using the information on the composition of firm employment in a given year, worker transitions from one employer to another, the occupation codes of workers, etc.). For details on the MEED, see the data appendix of Alfaro-Ureña, Manelici, and Vasquez (2019).

The challenge going forward is that a given firm may have several tax IDs. Given that our paper is centered on trade between firms, we need to aggregate all data up to the firm level. We therefore add (to the datasets just described) information on firm ownership.

Before 2019, CR did not have a systematic and compulsory reporting of firm ownership structures.[i] Thus, pre-2019, the BCCR made substantial efforts to identify ownership relationships between tax IDs. This task is crucial for the BCCR as it uses this information for its private sector sampling frame for national accounts and price statistics (among others). The dataset tracking firm ownership builds upon National Registry data. Before 2019, the BCCR received from the National Registry the following information: the (tax) ID, the status and nature of the ID, the company name, the legal representative or accountant, and the composition of the Board of Directors (the latter from 2016 onwards). While this information constitutes a

[i] In 2016, CR enacted legislation to require all relevant legal entities and arrangements to maintain registers of beneficial ownership information. However, for regulatory and technological reasons, the first round of data collection only occurred in 2019.

useful starting point, the main source on firm ownership pre-2019 is the fieldwork done by the BCCR at the occasion of its various surveys. We describe these surveys in Online Appendix A.1.3.[ii] Moreover, BCCR carries out an exhaustive investigation of the records (phones, physical addresses, individuals listed as contacts, pending payments to the Social Security Fund, and the Ministry of Finance) of possibly related firms. BCCR directly contacts the tax IDs with suspicious reporting (e.g., those registering employees but not sales, or vice versa). Once it has credibly identified that given tax IDs share owners, BCCR groups these IDs into a "grupo corporativo" or *corporate group.* Our construction of *corporate groups* builds upon these BCCR efforts.

A *"grupo empresarial"* or "firm group" is a set of tax IDs who not only share ownership, but also behave as one firm, meaning that one cannot consider them as separate business ventures. In a hypothetical example, tax IDs A, B, and C belong to the same *"grupo empresarial"* or "firm group". While these tax IDs are distinct, they operate as a single business unit whose objective is to produce and sell the good or service z. Assume that all sales are reported by tax ID A, all workers are employed by tax ID B, and tax ID C owns all the assets. Not aggregating the information of these three tax IDs up to the firm group level but treating tax IDs as distinct firms would lead to an overestimation of the number of firms in the economy and misleading conclusions on the behavior of each tax ID.

We add to the same firm group those tax IDs that belong to the same corporate group and also operate in the same sector as the tax IDs in the firm group. We expand our dataset with the tax returns of tax IDs that lack social security data if we learn that these tax IDs are part of a firm and corporate group. For instance, we add the tax returns of tax IDs that report revenues without reporting employees to the tax returns of their respective firm groups.

In our empirical analysis, we aggregate the data and treat firm groups as one individual firm. We keep track of business relationships of all tax IDs in the group with all other tax IDs in the economy, but keep only one identifier for the group. We keep the identifier, sector, and location of the most relevant tax ID in terms of sales within the group. For all other variables, values are summed across all tax identifiers under the same firm group identifier.

We want to study the universe of domestic private firms that are part of the non-financial market economy.[iii] Therefore, we drop non-governmental organizations, public entities, and those observations that are registered as households.

We also drop tax IDs in the education sector and the construction sector, as well as IDs in the financial sector. The education and the construction sectors are excluded based on the average length of the relationships between firms in each of these sectors and their buyers. These two sectors are those with the shortest relationships among all sectors. Firms in those sectors mostly provide one-off services (e.g., a short course or a renovation). We exclude the finance sector for two reasons. First and most importantly, this sector is extremely concentrated. For

[ii] These surveys are *"Encuesta Trimestral de Balanza de Pagos," "Encuesta Anual,"* and *"Estudio Económico."*

[iii] To be precise, we drop foreign-owned firms from the sample of domestic firms that we allow to be potential suppliers to MNCs. In addition, we also do not include in our analysis sample domestically-owned firms that are part of a corporate group where another firm is foreign-owned.

instance, the top four firms (three of which are state-owned and one foreign-owned) concentrate on average 73% of the revenues of the financial sector during the period 2008-2010 (the years before we start considering our events). The Herfindahl-Hirschman (HH) index of the industry is 0.31. As a reference, the U.S. Department of Justice considers an industry to be highly concentrated if the HH index is above 0.25. This is the most concentrated sector in our sample. The more concentrated a sector is, the more relevant potential concerns of contamination of the control group. Second, all foreign and state-owned firms in the finance sector combined account for 91.6% of the total revenues in the sector between 2008 and 2010. Put differently, domestic firms represent only 8.4% of the total revenues. On average, for all other sectors, domestic firms represent 62.5% of total revenues. The 8.4% share of revenues made by domestic firms in the financial sector is the lowest across all industries.

We drop firms for which we do not know either the sector or the province, as both are necessary in our event-study design. We do not keep firms for which there is less than one worker reported during all years of activity. These criteria leave us with 82,643 firms.

We impose minimal size restrictions for the sample considered in our empirical exercise. Firms have to report both workers and sales with no gaps in the data. Moreover, we only consider firms that, over the years, have a median of at least three workers. Finally, we drop firms with median sales of less than 50,000 U.S. dollars (CPI-deflated to 2013 dollars).

The size restrictions for domestic firms leave us with firms with relatively more stable data patterns. Firms with a median number of workers under 3 and median annual revenues under 50,000 U.S. dollars qualify as micro-enterprises in CR (see PYME calculator). Micro-enterprises have a more volatile economic activity (e.g., they are more prone to churning).

Table A1: Sample Coverage (%) for Domestic Firms After Restrictions

Sample / Variable	Sales	Empl.	Wage Bill	Exports	Imports	VA	Inputs	Net Assets	# Firms
Raw data (with non-missing sector, sales and empl.)	51.5	52.7	44.6	69.9	55.2	26.9	61.0	19.7	103,382
+ excluding state-owned enterprises	68.0	61.7	64.8	71.4	85.3	55.0	74.7	43.7	100,741
+ excluding finance and education	75.2	70.0	76.8	83.8	90.6	66.8	80.8	62.2	97,143
+ excluding households	75.5	73.7	78.5	83.8	90.6	67.7	80.9	62.3	93,369
+ excluding construction and real estate	82.6	81.8	86.2	84.9	92.2	77.2	86.1	77.2	82,643

Notes: Table A1 presents the total coverage (in %) between 2008 to 2017 of the values for the 24,370 domestic firms kept for analysis after we implement our sector and size restrictions. Each row presents the coverage over an increasingly more restrictive set of domestic firms. The first row reports the coverage over the full set of domestic firms having filled in the D-101 tax form *and* with non-missing information for their sector, sales, and employment. Each subsequent row introduces additional sectoral restrictions over the set of firms in the denominator of the coverage statistic. In the last row, the set of firms in the denominator contains the 82,643 firms in the non-financial market economy *before* imposing our size restrictions. We show the aggregate coverage for eight variables.

These size restrictions leave us with 24,370 domestic firms. However, despite losing more than two-thirds of the 82,643 firms upon applying our size restrictions, Table A1 (last row) shows that we keep those that employ most of the labor force and represent the largest share of sales, exports, income, costs, and assets. For most variables, the firms we keep cover over 80% of the value across the 82,643 firms in the non-financial market economy. Table A2 presents summary statistics for the 82,643 firms in the non-financial market economy (upper panel) and

the 24,370 firms surpassing our minimal size restrictions (lower panel).

Note that these 24,370 domestic firms include four types of firms: the never-suppliers (never supplying to an MNC between 2008 and 2017), the first-time suppliers to an MNC sometime between 2010 and 2015, the always-suppliers (already supplying to an MNC in either 2008 or 2009), and the first-time suppliers in either 2016 or 2017. Of these 24,370 firms, in the baseline economy-wide event-study, we only use the firms in the first two categories.

Table A2: Summary Statistics: All Domestic Firms in the Non-Financial Market Economy vs. Domestic Firms Kept After Minimal Size Restrictions

	# Firms	Mean	S.D.	Median
Domestic firms before min. size restr.				
Total Sales	82,643	488.3	2,990.6	120.9
Number of Workers	82,643	6.7	30.0	2.2
Wage Bill	82,643	49.7	278.5	11.5
Exports	5,236	374.7	2,558.1	5.8
Imports	25,147	184.7	1,434.8	3.2
Value Added	79,651	108.8	570.8	33.0
Input Costs	66,163	342.3	2,546.3	32.5
Total Net Assets	68,789	441.6	6,670.1	62.0
Domestic firms kept after min. size restr.				
Total Sales	24,370	1,241.5	5,342.8	379.9
Number of Workers	24,370	17.1	53.0	6.7
Wage Bill	24,370	135.5	497.0	42.3
Exports	3,046	510.4	3,250.0	10.8
Imports	10,141	398.1	2,224.4	13.8
Value Added	24,233	243.6	961.9	86.1
Input Costs	21,607	825.3	4,352.8	151.5
Total Net Assets	22,191	921.2	7,840.0	179.2

Notes: Table A2 reports summary statistics for the 82,643 firms in the non-financial market economy *before* imposing any size restrictions (upper panel) and for the 24,370 firms kept in our sample of analysis, *after* we impose our minimal size restrictions (lower panel). All variables correspond to averages across 2008-2017. Except for the number of workers, the mean, standard deviation, and median are in thousands of U.S. dollars (CPI-deflated to 2013 dollars).

Online Appendix A.1.2 Firm-to-Firm Transaction Data

Our most important dataset allows us tracks the near-universe of formal firm-to-firm relationships in CR between 2008 and 2017. This data is collected by the Ministry of Finance through the tax form D-151 (*"Declaración anual resumen de clientes, proveedores y gastos específicos"* or the "Declaration of the yearly summary of buyers, suppliers and specific expenses"). This declaration is compulsory not only to private businesses but to all actors in the economy (e.g., individuals providing professional services, public entities, NGOs, embassies etc.), irrespective of being subject to the corporate income tax or not. A late filing of this form is heavily penalized, e.g. in 2016 the late filing fee could go from 7,040 to 70,400 U.S. dollars.

To help enforce taxes, each firm has to report all of its corporate suppliers and buyers with a yearly accumulated amount of transactions above 2.5 million Costa Rican colones (approximately 4,200 U.S. dollars). As D-151 forms contain the yearly amount sold to or bought from each partner, this dataset allows us not just to track buyer-supplier relationships in a given year, but also to measure the intensity of those relationships.

The tax authority of CR uses information from third-party returns (such as D-151) to identify economic activity and sources of income. D-151 is not only used to enforce compliance for the general sales tax but also for the corporate income tax (CIT).[iv] Officials from the Ministry of Finance (MF) have provided us with details on how the D-151 form has been key to tax enforcement since 2008.[v] First, the MF staff confirms the filing of both the CIT and D-151 forms for each firm. This step is straightforward for two reasons: (i) most of this step is automated, and (ii) CR has one of the highest on-time filing rates for income tax forms among OECD countries (OECD, 2019).[vi] Second, the MF staff combines the CIT form for each firm with the transactions reported by other firms in relation to this firm[vii] to create a *shadow* tax form. This form provides an expected tax liability for each firm. This liability is also compared against benchmarks for firms in the same economic activity and region. Firms whose filed tax liability is flagged as departing from the expected tax liability are notified and asked to correct their filing under the threat of future audits. Third, the MF staff conducts an intensive auditing process for large firms (i.e., firms with annual sales above approximately 3.5 million U.S. dollars). These audits aim to determine the appropriate tax liability of those large firms.

Next, we followed a sequence of steps to ensure that several coding or reporting errors were corrected in the raw D-151 database, and that the IDs of firms identified as buyers and sellers are coherent with the rest of our data.

The first step relates to the fact that the Ministry of Finance usually assigns extra characters to the IDs of corporations or individuals, which need to be removed before the data can be linked to the tax returns and social security microdata. The presence of foreign IDs requires additional steps to ensure data quality: it is not unusual that the initial transactions of a foreign firm are recorded using passport or foreign ID numbers, whereas, later on, those transactions are recorded using a Costa Rican tax ID. BCCR tracks those changes to ensure that the transactions are imputed to the correct tax ID when building the dataset.

The second step involves identifying different reporting inconsistencies. The ideal case is one in which the transaction between two firms is reported by both firms, given the same description, and has the exact same reported amount in both filings. In such case, the duplication is taken into consideration to keep it as one observation, and there is no need to perform any

[iv] Brockmeyer et al. (2019) documents an example of the usefulness of the D-151 third-party reporting structure to enforce compliance to CIT.

[v] While the D-151 form exists since 1997, 2008 was the first year when its electronic filing became mandatory.

[vi] The OECD (2019) report also indicates that "the on-time filing rate is seen as an effective measure of the health of the tax system as well as the performance of the tax administration itself."

[vii] CR levies increasing average CIT rates on profits as a function of firms' revenue. The D-151 form is used both to check on the revenue figure declared in the CIT return (by checking the amounts declared by third-parties as sold to the firm) and also the profits (by checking the amounts declared as purchased from third-parties).

additional corrections. However, inconsistencies arise when transactions appear only once, the amount shown is different within a pair, submissions that were rejected by the Ministry of Finance cause duplicates of correct lines, or there is a lack of data. Also, whenever individuals buy from firms, individuals are not required to report that purchase, so around one-fifth of the reports by firms have no counterpart but cannot be classified as an error or misreporting.

The corrections that were done to the dataset are summarized hereafter:

1. Whenever the transaction was reported by both parts but with amounts appearing to differ because of an error in the position of the decimal point, historical data was used to identify the correct amount among the two options.

2. Whenever a pair of transactions had one of the partners reporting a transaction with an amount of zero, the amount from the partner reporting a positive value was assumed to be correct. The same solution was used whenever one partner filled in either its own tax ID or the tax ID of its partner, instead of the value of their transaction.

3. Whenever the difference in the value of a pair of transactions was more than 20% or 50 million colones (about 100 thousand U.S. dollars), and one of the partners reported a value of more than 500 million colones (about 1 million U.S. dollars) careful manual checks were completed (using historical data to identify the correct value).[viii]

4. Whenever a transaction appeared more than once because of a resubmission (usually for corrections), we only kept the most recent observation.

Tables A3 and A4 summarize the number of transactions and the corresponding value of the transactions that were analyzed, for three different years (as examples, the same analysis was carried out for all years between 2008 and 2017). For the empirical exercise we can use two sets of transactions: first, those showing up in pairs that were either matched perfectly in the raw data or with inconsistencies that were solved by the corrections explained beforehand. The second set of transactions that we can use are the cases where transactions had no partner, either because there was a reason for not having it as explained above, or because there is missing information.

Unsolved cases include those that could eventually be corrected but for which the value of the transaction is below our chosen threshold for manual checks. The second category of data that we cannot use are cases where transactions had no duplicate, but they are classified as rejected by the Ministry of Finance in the revision of the tax declaration submissions. There is a small set of transactions that we were able to identify as duplicates of others that are already considered in the data. Finally, the smallest set of transactions includes those that were excluded due to being mistakenly reported.[ix]

[viii] This last criterion was added to prioritize which transactions would be manually checked.

[ix] For example, the Ministry of Finance is aware that accounting firms sometimes mix up the forms of different buyer firms when submitting them to the tax authority, which are later rectified.

Table A3: Number of Cases, Firm-to-firm Transaction Data

Type of case	2008 Count	2008 %	2012 Count	2012 %	2015 Count	2015 %
Data in pairs	535,863	41.9%	998,355	40.5%	1,383,820	42.2%
No partner and accepted	493,769	38.7%	1,256,978	51.0%	1,626,907	49.6%
Subtotal of used data	**1,029,632**	**80.6%**	**2,255,333**	**91.5%**	**3,010,727**	**91.9%**
Unsolved	128,599	10.1%	202,710	8.2%	251,499	7.7%
No partner and rejected	108,969	8.5%	-	0.0%	-	0.0%
Duplicate	4,904	0.4%	5,936	0.2%	14,652	0.4%
Excluded	5,414	0.4%	34	0.0%	32	0.0%
Total	**1,277,518**	**100.0%**	**2,464,013**	**100.0%**	**3,276,910**	**100.0%**

Table A4: Value of Transactions, Firm-to-firm Transaction Data

Type of case	2008 Value	2008 %	2012 Value	2012 %	2015 Value	2015 %
Data in pairs	45,812	63.6%	55,489	67.5%	69,450	69.1%
No partner and accepted	11,808	16.4%	16,637	20.2%	18,496	18.4%
Subtotal of used data	**57,620**	**80.0%**	**72,126**	**87.7%**	**87,946**	**87.6%**
Unsolved	7,766	10.8%	10,002	12.2%	12,324	12.3%
No partner and rejected	6,145	8.5%	-	0.0%	-	0.0%
Duplicate	170	0.2%	71	0.1%	172	0.2%
Excluded	359	0.5%	1	0.0%	2	0.0%
Total	**72,060**	**100.0%**	**82,200**	**100.0%**	**100,444**	**100.0%**

Notes: Values in millions (U.S. dollars).

At the end of all these efforts of data-checking and cleaning, we manage to use more than 80% of the transactions and value of the transactions coming from the raw D-151 forms. For the second half of the sample period, we manage to use over 90% of the data, which is consistent with firms learning how to file the D-151 form without mistakes. Moreover, the transactions that we lose are either rejected, duplicated, or excluded (especially during the first years of our sample). Hence, the dropped transactions relate to reporting errors, not real transactions. Additionally, the transactions that are not used because they are categorized as "unsolved" are usually less than 10% of the total. It should be noted that their value represents a slightly larger percentage; that is because some of their mistakes involve ignoring the decimal point,

which can overestimate the values of the transaction by several orders of magnitude.

Moreover, in a related paper (see Alfaro-Ureña, Fuentes, Manelici, and Vasquez, 2018), we show that the main stylized facts established for the production networks of Belgium and Japan also hold for the Costa Rican network. This is reassuring as to quality of the firm-to-firm transaction data from CR.

Finally, in the analysis we only consider "first-time supplying to an MNC" events occurring between 2010 and 2015. We choose 2010 as the starting year because we aim for a reliable measure of the year when a domestic firm sells to its first MNC buyer. 2008 was the first year when the D-151 tax form (the base for the firm-to-firm transaction dataset) could be filed electronically. However, as 2008 was the year of transition to the digitized form, firms were still allowed to file the form on paper. We therefore suspect that the 2008 dataset is incomplete.[x] Even if a firm is observed as selling to an MNC in 2009 but not in 2008, we cannot rule out that this firm was selling to MNCs in 2008 as well (filing the form on paper in 2008). To improve the measurement of the first year of supplying to an MNC, we treat as first matches only those occurring after 2010 for domestic firms that had not sold to an MNC in both 2008 (the year of transition to electronic filing) and 2009 (the first year of mandatory electronic filing). We stop with 2015 to be able to observe each firm at least two years after its event.

Online Appendix A.1.3 Foreign Ownership Data

We construct a comprehensive dataset on the foreign ownership of firms by combining and cross-checking information from six different sources.

Our first source is the reporting of firms that are active under the Free Trade Zone (FTZ) regime. CR has followed a strategy of pursuing FDI investment by offering benefits to firms established in FTZ regimes. As summarized in OECD (2017b), the FTZ regime exempts beneficiary firm from custom duties on imports and exports, the withholding tax (on royalties, fees, dividends), interest income, the sales tax on local purchases of goods and services and the stamp duty. In addition, the FTZ regime exempts profits from corporate income tax for eight years and provides a 50% corporate income tax reduction during the following four years, but differences exist depending on the types of activities and the location of the FTZ. Profits from sales to the domestic market are taxed under separate tax rules. Firms that may apply for the FTZ regime must be either (i) export service firms (at least 50% of services must be exported), (ii) scientific research firms (firms or organizations), (iii) "strategic firms" or part of "strategic sectors" or (iv) "significant suppliers" (at least 40% of their sales are made to FTZ firms). Due to those benefits, firms have to comply with full reporting of their sources of capital. This information is collected by Procomer and made available to BCCR for statistical purposes.

A complementary source of information is the Costa Rican Investment Promotion Agency (CINDE), which is a private, non-profit organization that started its operations in 1982. CINDE has mediated the entry of more than 300 foreign-owned firms in CR, such

[x] This is likely to explain the lower data coverage for 2008 that we report in Tables A3 and A4.

as Intel, Procter&Gamble, Hewlett Packard, or St. Jude Medical.[xi] CINDE shared with us information on the foreign ownership of firms they attracted. This set of foreign-owned firms contains both firms in the FTZ regime and firms that did not qualify for this regime.

Beyond the foreign-owned firms in FTZs and foreign-owned firms attracted by CINDE, there are limitations to the knowledge of foreign ownership of the remaining firms in the economy. BCCR carries out three surveys that serve as sources of complementary information on flows and sources of capital for foreign-owned firms.

1. *"Encuesta Trimestral de Balanza de Pagos"* or the "Quarterly Balance of Payments Survey": collects information on a sample of large firms (currently 250 to 300 firms) about their country of origin and percentage of foreign ownership.

2. *"Encuesta Anual"* or the "Annual Survey": similar to the quarterly survey, but administered on a yearly basis. It contains a sample of 50 to 100 firms.

3. *"Estudio Económico"* or the "Economic Study": when CR updated the system of national accounts, BCCR surveyed thousands of firms. Out of those, it identified and started tracking close to 944 firms having received foreign capital. For those firms, the "Economy Study" tracks the percentage of foreign ownership.

Our last source of information is Orbis, a commercial product of Bureau Van Dijk.[xii] The Orbis data was used in three ways. First, it has helped us confirm which of the foreign-owned firms in CR belonged to an MNC group (with an HQ country different from CR and affiliates in at least another country different from the HQ country) and which ones were single-location firms (i.e., only operating in CR) but set up with foreign capital (e.g., a small foreign-owned restaurant). Second, Orbis has also helped us confirm the HQ country of MNCs. Third and last, we aimed to be as comprehensive as possible when constructing the set of MNC affiliates in the country. For this reason, we took advantage of Orbis to double-check the information in the administrative data with that in Orbis. For instance, in Orbis, one can observe the set of MNC GUOs (global ultimate owners) who report having an affiliate in CR.

After cross-checking all sources, we have identified 3,855 tax IDs that are part of a corporate group in which there are tax IDs with partial or full foreign ownership. To obtain a sample comparable to that of our domestic firms, we exclude NGOs, governmental entities (e.g., embassies) and households, so as to focus on private firms alone. After adding the information on the different layers of shared ownership, we arrive to 2,156 firm groups that are part of a corporate group with at least partial foreign ownership (see Online Appendix A.1.1 for details on the difference between firm groups and corporate groups).

[xi] CINDE was awarded in 2018 for the fourth consecutive year as the "Best Investment Promotion Agency" of Latin America and the Caribbean in a ranking compiled by the *Site Selection* magazine.

[xii] The financial and balance sheet information in ORBIS comes from business registers collected by the local Chambers of Commerce to fulfill legal and administrative requirements (Kalemli-Özcan, Sørensen, Villegas-Sanchez, Volosovych, and Yeşiltaş, 2015).

As motivated in Section 2.2, not all of these 2,156 firm groups are suitable for our analysis. Out of these 2,156 firm groups we create three mutually exclusive sets: (i) firm groups that are entirely domestically-owned (despite being part of corporate groups where another firm group is partially foreign-owned), (ii) firm groups that are themselves at least partially foreign-owned but whose median of workers is under 100 workers (across all years of activity in the country), and (iii) firm groups that are themselves at least partially foreign-owned and whose median of workers is over 100 workers.

Given our interest in measuring the performance gains of joining MNC supply chains, we focus on the 622 firm groups in category (iii), that are actual MNC affiliates and that have a substantial economic presence in the country. The fully domestically-owned firm groups in category (i) operate in different sectors than those of firm groups that are partially-owned and part of their same corporate group. Given the loose connection between firm groups part of the same corporate group, particularly when not in the same sector, we do not consider them for analysis. The typical firm in category (ii) is not an MNC affiliate (but a single-location firm with partial foreign-ownership) and serves local demand, either in service sectors (e.g., hotels) or in sectors with low domestic input requirements (e.g., import/export retail or real estate agencies). For these reasons, we also do not consider firms in the category (ii) for analysis. Another important advantage of focusing only on firms in category (iii) is that it allows us to circumvent issues related to FDI statistics, such as the rising use of shell companies. Shell companies, or "special purpose entities (SPEs) are companies that do not have substantial economic activity in a country but are used by companies as devices to raise capital or to hold assets and liabilities. SPEs can lead to the inflation of FDI statistics" and obscure the ultimate purpose of FDI (OECD, 2017a).[xiii]

In Table A5 we present descriptive statistics for three types of firms (firm groups): (a) the sample of domestic private firms that are part of the non-financial market economy (if part of a corporate group, this group is fully domestically-owned), (b) firms that are part of a corporate group with partial foreign ownership that are not large MNC affiliates and not considered for analysis (puts together categories (i) and (ii) defined in the previous paragraph), or (c) the sample of MNC affiliates considered for analysis (category (iii) above). Category (a) is the same one described in Table A2. The firms that are part of corporate groups with partial foreign ownership and that are excluded from the analysis are significantly larger than domestic firms, while (large) MNCs are themselves an order of magnitude larger than the excluded firms part of corporate groups with partial foreign ownership.

While restrictions on the MNC status and median number of workers might seem costly for the number of firms kept – out to the respective totals for the full sample of 2,156 firms part of a corporate group with partial foreign ownership – these 622 MNCs are actually responsible for most of the foreign activity in CR. Table A6 shows that for most of the variables, the MNCs

[xiii] Identifying shell companies is a notoriously difficult task. The OECD advises governments to use firm size as a criterion to identify shell companies/SPEs: "An enterprise is usually considered as an SPE if it meets the following criteria: [...] (iii) The enterprise has no or few employees, little or no production in the host economy and little or no physical presence" (OECD, 2008).

that we use for our empirical exercises account for over 70% of the totals across all firms part of a corporate group with partial foreign ownership. Hence, the criteria leading to the sample of 622 MNCs are not restrictive in terms of their coverage of the full sample of firms associated with foreign ownership.

Table A5: Descriptive Statistics by Firm Ownership

	# Firms	Mean	S.D.	Median
A. Fully domestic firms				
Total Sales	82,643	488.3	2,990.6	120.9
Number of Workers	82,643	6.7	30.0	2.2
Wage Bill	82,643	49.7	278.5	11.5
Exports	5,236	374.7	2,558.1	5.8
Imports	25,147	184.7	1,434.8	3.2
Value Added	79,651	108.8	570.8	33.0
Input Costs	66,163	342.3	2,546.3	32.5
Total Net Assets	68,789	441.6	6,670.1	62.0
Firms Entering Pre-2005	82,643	27.7	44.7	0
B. Firms with partial foreign ownership *Excluding (Large) MNCs*				
Total Sales	1,534	7,812.2	64,058.0	1,076.7
Number of Workers	1,534	51.1	346.8	12.8
Wage Bill	1,534	625.1	3,837.9	158.2
Exports	572	1,641.9	8,472.4	45.2
Imports	1,069	1,826.7	6,890.9	84.1
Value Added	1,522	1,735.9	12,687.6	294.1
Input Costs	1,417	5,540.8	52,183.9	261.1
Total Net Assets	1,512	8,400.2	45,891.8	978.8
Firms Entering Pre-2005	1,534	45.0	49.8	0
C. (Large) MNCs				
Total Sales	622	41,922.3	101,003.4	12,023.3
Number of Workers	622	373.1	874.7	161.6
Wage Bill	622	5,005.5	10,080.6	2,190.5
Exports	551	16,113.9	80,016.6	629.4
Imports	611	14,310.9	68,708.8	1,443.2
Value Added	621	12,290.1	51,329.9	3,887.2
Input Costs	601	24,073.2	58,683.3	4,111.8
Total Net Assets	619	39,930.0	79,423.7	10,661.7
Firms Entering Pre-2005	622	64.6	47.8	1

Notes: Table A5 presents descriptive statistics for three types of firms (firm groups): (A) the sample of domestic private firms before imposing minimal size restrictions, (B) firms that are part of a corporate group with partial foreign ownership that are not large MNC affiliates and not considered for analysis and (C) the sample of MNC affiliates considered for analysis. Category (A) is the same one described in Table A2. With the exception of the number of workers, the mean, standard deviation, and median are in thousands of CPI-deflated 2013 U.S. dollars. These statistics are averages across 2008 to 2017.

Finally, one can be concerned about the importance of using Orbis data in generating the final set of 622 MNCs that we study. Of the 622 MNCs found in the union of administrative data and Orbis, 93.6% were already identified as foreign-owned in the administrative data.

Of those MNCs among the 622 which are in a Free Trade Zone, 100% were already known as foreign-owned in the administrative data. Also, the 93.6% of MNCs already known in the administrative data as foreign-owned cover 96.8% of the MNCs in manufacturing and 97.4% of the MNCs' export value.

Table A6: MNC Sample Coverage

Total Sales	69.8%
Number of Workers	75.6%
Wage Bill	77.3%
Exports	90.9%
Imports	83.1%
Value Added	75.6%
Input Costs	66.0%
Total Net Assets	68.0%

Notes: Table A6 presents the total coverage for the period 2008 to 2017 (summing all years) of the values for the 622 MNCs out the values for the full sample of 2,156 firms part of a corporate group with partial foreign ownership (across eight variables). The 2,156 firms correspond to the ones in panels B and C of Table A5.

Table A7: Country of Global Ultimate Ownership

Country of GUO	Frequency	Percent	Cumulative
United States	328	52.73	52.73
Panama	35	5.63	58.36
Great Britain	23	3.70	62.06
Mexico	21	3.38	65.43
Spain	20	3.22	68.65
Colombia	16	2.57	71.22
Switzerland	15	2.41	73.63
Canada	14	2.25	75.88
Germany	14	2.25	78.14
France	14	2.25	80.39
Netherlands	14	2.25	82.64
Japan	10	1.61	84.24
Guatemala	9	1.45	85.69
El Salvador	9	1.45	87.14
Ireland	7	1.13	88.26
...	...	...	
Total	622	100	

Notes: Table A7 reports the countries of global ultimate ownership (GUO) that correspond to at least seven of the 622 MNCs in the final sample. 53% of MNCs have the United States as their country of GUO. The countries of the GUO for the remaining 73 MNCs not reported in the table above are as follows: Venezuela (6 MNCs), China and Luxembourg (5 MNCs each), Belgium, Italy and Nicaragua (4 MNCs each), Chile, Denmark, Honduras, India, South Korea and Virgin Islands (3 MNCs each), Australia, Bermuda, Brazil, Indonesia, Peru, Sweden, Singapore (2 MNCs each), and finally Austria, Bulgaria, Belize, Curaçao, Ecuador, Greece, Hong Kong, Hungary, Israel, Cayman Islands, Norway, Serbia, and Trinidad and Tobago (1 MNC each).

Online Appendix A.1.4 Data Coverage and Informality in Costa Rica

Data coverage of the formal economy. As seen in Section 2.1 and Online Appendix A.1.1, one of the backbones of our administrative data merge contains the universe of corporate income tax (CIT) returns of active formal firms in CR between 2008 and 2017.

The CIT returns cover all the formal workers in CR, where the universe of formal workers is that recorded by the Social Security Fund. Workers have strong incentives to ensure that the information reported on their behalf by their employer to the Social Security is accurate. Their public health insurance and retirement funds depend on this accurate reporting. For variables other than employment, the CIT returns cover the vast majority of the national accounts' totals. For instance, firms with CIT returns explain close to 98% of CR's international trade.

In sum, the administrative datasets behind our administrative data merge cover the near totality of formal economic activity in CR. Online Appendix A.1.1 to Online Appendix A.1.3 provide descriptive statistics of the coverage of the formal economy of the final administrative data merge (after applying the sample restrictions).

Data coverage of the full economy. The administrative data does not contain all firms in CR but only those participating in the formal economy. We present several statistics on the prevalence of informality in CR – first for firms (the unit of analysis in our baseline regressions) and then for workers. We also contrast these statistics to those for the other countries with administrative firm-to-firm transaction data used for research.

First, for firms, there are two ways to remain informal and thus be excluded from the data used in this project: (i) the firm is not incorporated in the National Registry, and/or (ii) does not report employees to the Social Security Fund. Such a "firm" is indistinguishable from an informal household entrepreneurship. INEC (the National Institute of Statistics and Census of CR) identifies the production of informal households using the annual *Productive Household Survey*. BCCR uses this survey to estimate the share of household production in the economy. Estimates for 2017 reveal that the household sector accounts for 21% of the Costa Rican GDP. In comparison, according to the OECD, the household sector accounts for 15% of GDP in Belgium, 20% in Chile, and 28% in Turkey.

A note on our size restrictions for firms in the baseline sample is in order. As BCCR centralizes multiple administrative datasets, it is unlikely that a firm with three employees or more and over 50,000 U.S. dollars in revenues (our size restrictions) can remain unknown to BCCR for long. To compile the national accounts, BCCR cross-validates the BCCR records with the National Registry of firms, the Ministry of Finance, the Social Security Fund, PROCOMER, and the Ministry of International Trade. In this process, BCCR detects firms with a partially formal presence. The larger a firm is, the more likely it is to be caught. For instance, the buyers of larger firms have incentives to report their intermediate purchases in the D-151 firm-to-firm transaction records (to reduce their tax liabilities). The decline in the likelihood of being informal by firm size is a well-established fact in the informality literature (Ulyssea, 2020).

Second, for workers, INEC defines the informality rate as "the percentage of workers in employment a) not contributing to the social security system, b) unpaid workers or, c) self-

employed workers and employers who have companies that are not registered in the National Property Registry and do not keep a formal accounting." For informal workers in the first two categories a) and b), their employing firm can be formal or informal (according to the definition in the above paragraph). The third category c) includes, among others, many individuals who are self-employed but who leave a paper trail of their economic activity by making contributions to the Social Security Fund and filing taxes (though without keeping formal accounting books). These self-employed individuals are classified as informally employed because they have not registered their operation in the National Registry. These workers are counted as informal even if they do not evade their tax liability or social security contributions. These are, for example, lawyers or engineers who provide services directly to individuals. In the last years of data, these "own-account workers" who are counted as informal by INEC represent around 20% of the total employed workers, and more than half of all the informal employment in the country (as defined by INEC).

INEC reports a value of informality in employment (including self-employed individuals) of 44% in the last available year, but also shows that only 29.7% of individuals lack health insurance through their employment. Hence, 70.3% of individuals (including all formal workers and a significant part of the workers classified as informal in the INEC definition above) are recorded in Social Security records and appear in our employment datasets.

An alternative definition of informal employment is that used by ILO (2018). According to ILO (2018), "employers, own-account workers and members of producers' cooperatives with enterprises in the formal sector are classified as having a formal job." From Table B.8 in ILO (2018), we learn that the share of informal employment in total employment is 10.8% in Belgium, 27.4% in Costa Rica, 32% in Turkey, 32.2% in Chile, 47% in Ecuador, 81.1% in India, 87.7% in Uganda, and 91.1% in Rwanda. On average, this share is 53.1% for Latin America. The percentages described in ILO (2018) as formal employment are in line with what we can capture in our employment data before the minimal size restrictions.

Informality and the research question in this paper. Using the terminology of Ulyssea (2020), we distinguish between the *two margins of informality* by which firms can adjust to a shock (in our case, the shock of becoming a direct supplier to an MNC): *the extensive margin* (based on whether firms register and pay entry fees to achieve a formal status) and *the intensive margin* (based on whether firms that are formal in the first sense hire workers without a formal contract or report only part of their economic activity).

Let us start with the *extensive margin of firm informality*. In the case of our specific research question, firms that become direct suppliers to MNCs are unlikely to adjust to the event on the extensive margin (i.e., by becoming formal once they start directly selling to an MNC). Due to the higher scrutiny of the Costa Rican tax authority and their own internal policies (prompted by pressure from stakeholders to source responsibly), MNCs are unlikely to accept being supplied by firms that are not already formal.

Now, one can still worry that first-time suppliers might react to the event through the *intensive margin of informality*, by changing the formality status of their existing workers or

reporting a different share of their full economic activity. First, we have conducted a tax compliance robustness check, which uses the third-party reporting structure of the D-151 tax form (the tax form behind the Costa Rican firm-to-firm transaction data). We find that becoming a supplier to MNCs is unlikely to have a bearing on measures of third-party reporting quality, and if it does, the effect is the opposite to that predicted by a reduction of tax-evasive behaviors. For details, see Section 5.3.

Second, we have also carried out a robustness check that leverages the matched employer-employee data from CR's Social Security Fund. In this robustness check, we test whether first-time suppliers to MNCs tend to report a higher share of new hires whose prior employment status is either long-term nonemployment or informality. If we were to find such evidence, this might indicate that after their event, first-time suppliers began to formalize their previously informal workers. We fail to find such evidence. This exercise implies that the expansion in employment experienced by first-time suppliers is a legitimate one and not just an artifact of changes in tax evasion behavior. For details, see Section 5.3.

Online Appendix A.2 Procomer "Productive Linkages" Data

Online Appendix A.2.1 Data Cleaning and Sample Construction

We were granted access to the records of Procomer (the Trade Promotion Agency of CR) that track its implementation of "Productive Linkages:" a matchmaking program between MNCs and domestic firms. Procomer has a strong reputation both in CR and abroad. In several years, the International Trade Centre granted Procomer the title of "Best Trade Promotion Organization from a Developing Country." The World Bank frequently mentions the "Productive Linkages" program as a role model for its ability to improve the local integration of MNC affiliates (see for example Akhlaque et al., 2017).

At its origins in 1999, the program was supported by the Inter-American Development Bank and was known as the "Supplier Development Project for High-Tech MNCs." The program has since undergone several changes to its name (*"CR Provee"* or *"CR Supplies"* was its longest-lasting name) and, to a lesser extent, to its organizational structure. That said, on its key aspects, the program has not been significantly altered since 2001.[xiv] This allows us to consider matches mediated by Procomer since 2001 as receiving a similar treatment.

This confidential data could only be accessed in a fully-secured location at the Central Bank of CR. Before making use of the Procomer records, we first had to complete three tasks:

1. Assign tax IDs to firms, as in most Procomer data sources firms were identified through a (non-standardized) version of their name. Without assigning a unique tax ID to each firm, one could not combine the various Procomer data sources and merge the result with administrative data sources.

2. Digitize those parts of the data shared as PDFs (mostly summaries of firm evaluations, approximately 650 PDFs) or archived emails (approximately 8,000 emails).

[xiv] For more details, see Monge-González and Rodriguez-Álvarez (2013).

3. Check both the internal consistency of Procomer's records and their accuracy (e.g., the occurrence and amount of a certain transaction) in the firm-to-firm transaction data. We found reassuring overlaps between Procomer records and administrative records.

After concluding these tasks, we learned that Procomer undertook 1,149 evaluations between 2004 and 2015. Each evaluation involves a visit to the firm from a Procomer assessor and a detailed survey (see Figure A1 for an example). Recent surveys are organized around five modules: productive capacity, market capacity, cooperation, R&D capacity, and quality.[xv] For example, the quality module asks whether the firm has both general quality management certificates (e.g., ISO-9001) and sector-specific certificates (e.g., ISO-13485, for the medical devices and related services sector).

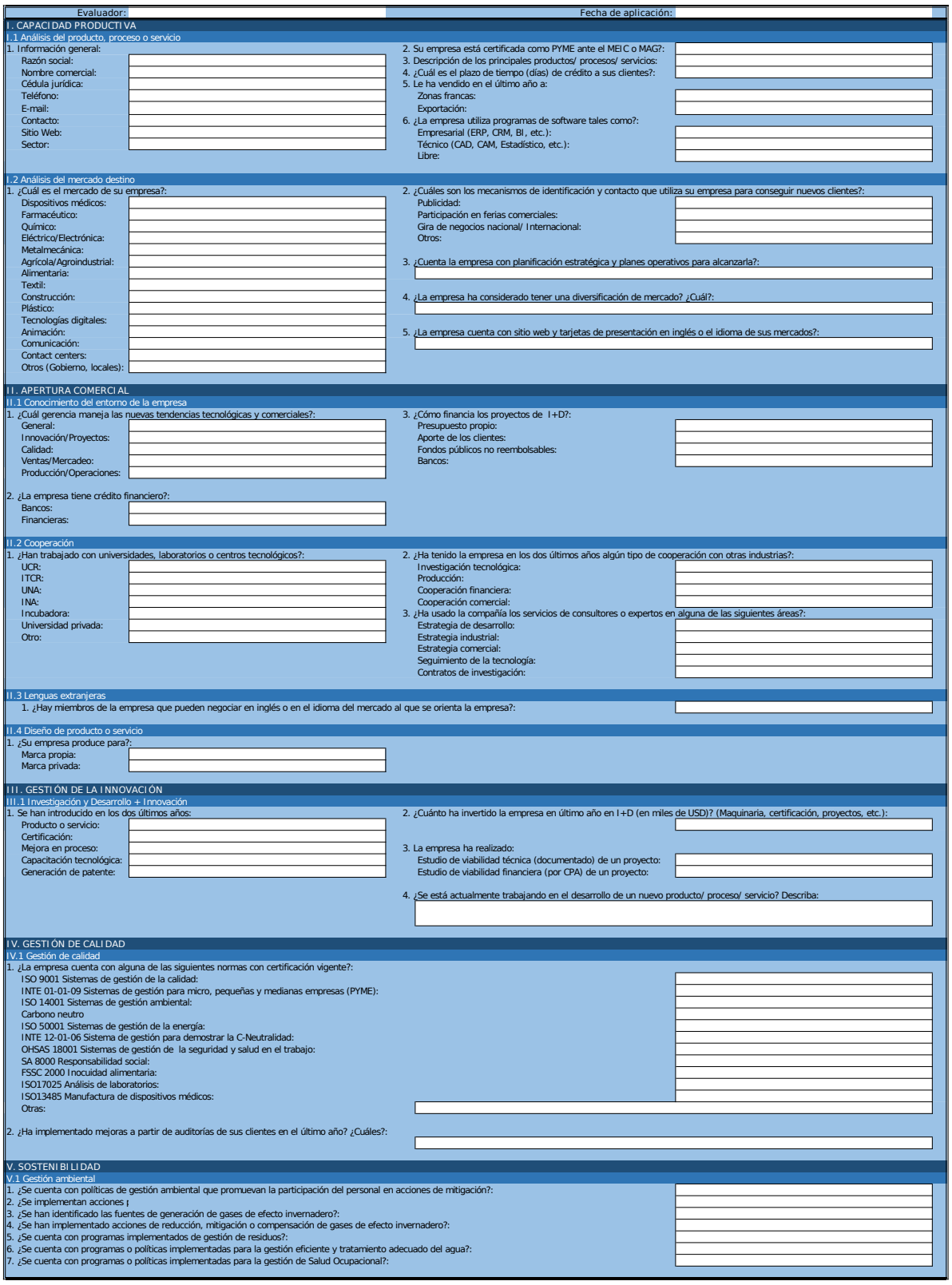
Each evaluation is concluded with an absolute score, a letter grade category based on this absolute score, and recommendations on which Procomer program the firm is fit to benefit from. The program we study ("Productive Linkages") is one option of follow-up. These 1,149 evaluations refer to 921 distinct firms. Firms with multiple attempted deals are more likely to have multiple evaluations, as Procomer aimed to keep scores updated for active candidates. To compare winning and losing candidates for a deal, we use the absolute score of their most recent evaluation carried out prior to that deal.

Moreover, we have also found that Procomer has successfully mediated 1,985 deals between 2001 and 2016, for which we observe the buyer and winning supplier, the year of the deal, its amount, and a description of the good or service traded. These 1,985 deals correspond to 560 unique suppliers and 324 unique buyers.[xvi] Commonly purchased goods include machinery, plastic accessories, and chemical products. Among services, metalworking, software development, and plant and equipment maintenance are the most frequent.

Table A8 shows that MNCs generating first-time deals through Procomer are more likely to operate in manufacturing and be headquartered in either the U.S. or Canada than MNCs generating first-time deals economy-wide. This is in line with Procomer working more closely with MNCs attracted through tax incentives in Free Trade Zones, as their integration in the local economy is of particular interest to the government.

Without a centralized record of the shortlists shared for these deals, we had to rely on the archived emails to reconstruct them. Whenever we could not find the corresponding emails for the shortlists shared by Procomer for a specific deal, we reconstructed them by applying the original rules used to generate them. Namely, for each deal, Procomer considered only firms that were either in the same four-digit ISIC sector or in the same sector category of the "suppliers database" of CINDE. All candidates needed to have been evaluated by Procomer before the deal and, hence, have a Procomer score. "Productive Linkages" only considered shortlists of up to five candidates. Shortlists could contain fewer than five candidates if (i) the scores of the last ranked firms were much worse than those of the highest scored candidate, or (ii) there were fewer than five firms in the supplying sector. In sum, for each deal, we use up

[xv] While the structure of the survey evolved across time, there is considerable continuity in the themes covered.
[xvi] Despite an exhaustive search, we were not able to find the tax ID of two of these firms.


Evaluador: Fecha de aplicación:

I. CAPACIDAD PRODUCTIVA

I.1 Análisis del producto, proceso o servicio

1. Información general:
Razón social:
Nombre comercial:
Cédula jurídica:
Teléfono:
E-mail:
Contacto:
Sitio Web:
Sector:

2. Su empresa está certificada como PYME ante el MEIC o MAG?:
3. Descripción de los principales productos/ procesos/ servicios:
4. ¿Cuál es el plazo de tiempo (días) de crédito a sus clientes?:
5. Le ha vendido en el último año a:
Zonas francas:
Exportación:
6. ¿La empresa utiliza programas de software tales como?:
Empresarial (ERP, CRM, BI, etc.):
Técnico (CAD, CAM, Estadístico, etc.):
Libre:

I.2 Análisis del mercado destino

1. ¿Cuál es el mercado de su empresa?:
Dispositivos médicos:
Farmacéutico:
Químico:
Eléctrico/Electrónica:
Metalmecánica:
Agrícola/Agroindustrial:
Alimentaria:
Textil:
Construcción:
Plástico:
Tecnologías digitales:
Animación:
Comunicación:
Contact centers:
Otros (Gobierno, locales):

2. ¿Cuáles son los mecanismos de identificación y contacto que utiliza su empresa para conseguir nuevos clientes?:
Publicidad:
Participación en ferias comerciales:
Gira de negocios nacional/ Internacional:
Otros:

3. ¿Cuenta la empresa con planificación estratégica y planes operativos para alcanzarla?:

4. ¿La empresa ha considerado tener una diversificación de mercado? ¿Cuál?:

5. ¿La empresa cuenta con sitio web y tarjetas de presentación en inglés o el idioma de sus mercados?:

II. APERTURA COMERCIAL

II.1 Conocimiento del entorno de la empresa

1. ¿Cuál gerencia maneja las nuevas tendencias tecnológicas y comerciales?:
General:
Innovación/Proyectos:
Calidad:
Ventas/Mercadeo:
Producción/Operaciones:

2. ¿La empresa tiene crédito financiero?:
Bancos:
Financieras:

3. ¿Cómo financia los proyectos de I+D?:
Presupuesto propio:
Aporte de los clientes:
Fondos públicos no reembolsables:
Bancos:

II.2 Cooperación

1. ¿Han trabajado con universidades, laboratorios o centros tecnológicos?:
UCR:
ITCR:
UNA:
INA:
Incubadora:
Universidad privada:
Otro:

2. ¿Ha tenido la empresa en los dos últimos años algún tipo de cooperación con otras industrias?:
Investigación tecnológica:
Producción:
Cooperación financiera:
Cooperación comercial:

3. ¿Ha usado la compañía los servicios de consultores o expertos en alguna de las siguientes áreas?:
Estrategia de desarrollo:
Estrategia industrial:
Estrategia comercial:
Seguimiento de la tecnología:
Contratos de investigación:

II.3 Lenguas extranjeras

1. ¿Hay miembros de la empresa que pueden negociar en inglés o en el idioma del mercado al que se orienta la empresa?:

II.4 Diseño de producto o servicio

1. ¿Su empresa produce para?:
Marca propia:
Marca privada:

III. GESTIÓN DE LA INNOVACIÓN

III.1 Investigación y Desarrollo + Innovación

1. Se han introducido en los dos últimos años:
Producto o servicio:
Certificación:
Mejora en proceso:
Capacitación tecnológica:
Generación de patente:

2. ¿Cuánto ha invertido la empresa en último año en I+D (en miles de USD)? (Maquinaria, certificación, proyectos, etc.):

3. La empresa ha realizado:
Estudio de viabilidad técnica (documentado) de un proyecto:
Estudio de viabilidad financiera (por CPA) de un proyecto:

4. ¿Se está actualmente trabajando en el desarrollo de un nuevo producto/ proceso/ servicio? Describa:

IV. GESTIÓN DE CALIDAD

IV.1 Gestión de calidad

1. ¿La empresa cuenta con alguna de las siguientes normas con certificación vigente?:
ISO 9001 Sistemas de gestión de la calidad:
INTE 01-01-09 Sistemas de gestión para micro, pequeñas y medianas empresas (PYME):
ISO 14001 Sistemas de gestión ambiental:
Carbono neutro
ISO 50001 Sistemas de gestión de la energía:
INTE 12-01-06 Sistema de gestión para demostrar la C-Neutralidad:
OHSAS 18001 Sistemas de gestión de la seguridad y salud en el trabajo:
SA 8000 Responsabilidad social:
FSSC 2000 Inocuidad alimentaria:
ISO17025 Análisis de laboratorios:
ISO13485 Manufactura de dispositivos médicos:
Otras:

2. ¿Ha implementado mejoras a partir de auditorías de sus clientes en el último año? ¿Cuáles?:

V. SOSTENIBILIDAD

V.1 Gestión ambiental

1. ¿Se cuenta con políticas de gestión ambiental que promuevan la participación del personal en acciones de mitigación?:
2. ¿Se implementan acciones p
3. ¿Se han identificado las fuentes de generación de gases de efecto invernadero?:
4. ¿Se han implementado acciones de reducción, mitigación o compensación de gases de efecto invernadero?:
5. ¿Se cuenta con programas implementados de gestión de residuos?:
6. ¿Se cuenta con programas o políticas implementadas para la gestión eficiente y tratamiento adecuado del agua?:
7. ¿Se cuenta con programas o políticas implementadas para la gestión de Salud Ocupacional?:

Figure A1: Example of a "Productive Linkages" Evaluation Form

Notes: Figure A1 presents an example of a "Productive Linkages" evaluation form based on which Procomer assigned firms a score of readiness to start supplying to MNCs. The Procomer staff ("evaluador") evaluated the firm on five dimensions: productive capacity ("capacidad productiva," e.g., "how long can the firm extend credit to its customers?"), commercial openness ("apertura comercial," e.g., "are there employees in the firm who can negotiate in English or in the language of the target market of the firm?"), innovation management ("gestión de la innovación," e.g., "how much has the firm invested in R&D in the last year?"), quality management ("gestión de la calidad," e.g., "does the firm have an ISO-9001 quality management certification?"), and sustainability ("sostenibilidad," e.g., "has the firm implemented any actions to reduce, mitigate or compensate its greenhouse gas emissions?").

to five of the highest-scoring firms satisfying the sectoral condition, as long as the difference between each firm's score and the highest score in that shortlist is less than 20 points.

Before setting the final set of rules that define the sample for the "Productive Linkages" research design, more context on the motivations and implementation of the "Productive Linkages" program was needed. To that end, we carried out extensive interviews with both contemporary and past Procomer staff, as well as with MNCs and domestic firms participating in the "Productive Linkages" program (see description of firm surveys in Online Appendix F). The main takeaway from these interviews was that in order to implement a clean "Productive Linkages" design, one has to study only deals meeting the strict criteria described below.

Table A8: Comparison of MNC Buyers: Economy-Wide vs. Procomer

	All MNCs	Procomer MNCs
Sector of MNC		
Agriculture, Forestry and Fishing	5.86	1.60
Manufacturing	38.06	68.80
Water Supply, Sewerage and Waste Management	0.45	-
Construction	1.13	0.80
Wholesale and Retail Trade	13.96	5.60
Transportation and Storage	4.28	0.80
Accommodation and Food Services	5.86	-
Information and Communications	6.76	2.40
Real Estate	4.05	
Professional, Scientific and Technical	5.86	4.80
Administrative and Support Services	11.71	13.60
Education	0.90	-
Human Health and Social Work	0.23	-
Art, Entertainment and Recreation	0.45	-
Other Services	0.23	0.80
Mining and Quarrying	0.23	0.80
Total	100.00	100.00
Region of Global Ultimate Ownership of MNC		
Asia-Australia	5.33	2.40
Europe	24.39	24.00
Latin America and the Caribbean	19.67	14.40
U.S. and Canada	50.61	59.20
Total	100.00	100.00

While the objective of "Productive Linkages" was to link domestic suppliers to MNC buyers, Procomer sometimes fostered linkages for suppliers that were foreign and/or for domestic buyers. Having been already had deals through Procomer in the past also did not disqualify a firm from joining future shortlists. The objective of Procomer was to share with each MNC a shortlist that contained the most competent firms to supply the demanded input.

Our interest lies in the impact of the first "Productive Linkages" deal of a domestic firm with an MNC. Thus, we only consider the first such deals. For firms that are only matched in one year by Procomer we keep all deals occurring that year. For firms with deals in several years, we only keep the deals occurring in the first year. Whenever the event was triggered by more than one MNC buyer, the amount associated to the event is the sum of all amounts sold to MNCs that year. We dismiss events for which this sum is less than 5,000 U.S. dollars, as to

maintain a comparable "observability" threshold as in the firm-to-firm transaction data.

Moreover, we also drop first deals where (i) losers had already experienced deals with MNCs prior to the relevant deal (the deal where they are losers), or where (ii) losers start supplying to MNCs in the two years after the relevant deal. Otherwise, losers do not provide a valid counterfactual for the winner, as they have already experienced an event or are experiencing one contemporaneously. Allowing them in the sample would obscure the interpretation of the behavior of winner outcomes relative to losers' outcomes.

Finally, we only study first deals brokered by Procomer between 2009 and 2015 because (i) the corporate income tax returns and firm-to-firm transaction datasets only start in 2008 and we want to be able to cross-check Procomer records with these administrative datasets, and (ii) we need at least two years' worth of administrative data after the deal to study its effects. Applying all conditions leaves us with 31 events that involve 31 distinct domestic winners, 84 domestic losers (of which 51 distinct), and 53 distinct MNCs triggering these 31 events.

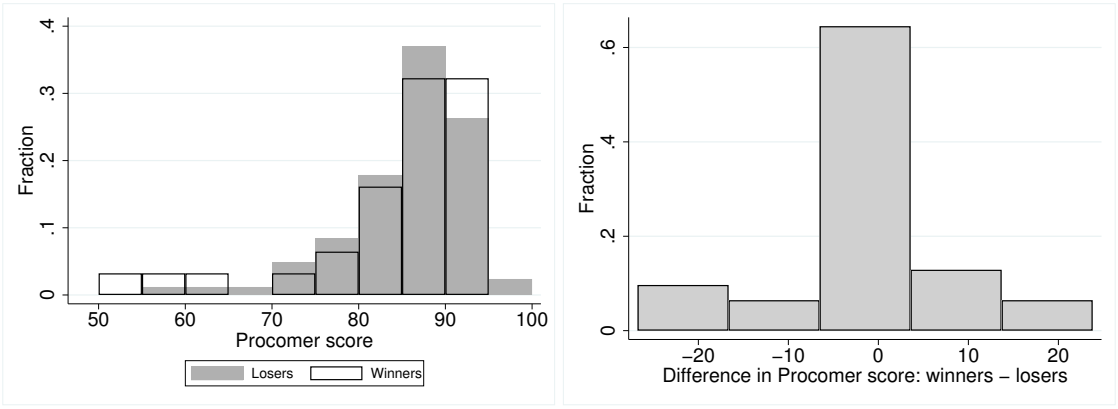
Online Appendix A.2.2 Descriptive Statistics of the "Productive Linkages" Sample

In this section we present additional evidence on the Procomer sample of analysis. Panel A2a in Figure A2 shows the histograms of winners' and losers' scores, while panel A2b plots the histogram of within-deal differences between winners' score and the average of losers' scores. In both panels there is no systematic tendency for the winners' scores to be larger than the losers'.

One may be concerned that Procomer scores are not informative about firm performance. For instance, one may fear that government officials are unable to correctly assess firm capabilities or that they may have ulterior motives to provide a too high or too low score to specific firms. Several pieces of evidence assuage this concern.

First, Table A9 compares winners and losers in the year before the relevant deal (the deal won by the winner or the deal to which the loser was a contender). This table fails to find statistically significant differences between winners and losers across several measures of firm performance built on data coming from different sources: corporate income tax returns data, firm-to-firm transaction data, and records of Procomer scores. Nevertheless, one can note that losers tend to be larger than winners. This aligns with anecdotal evidence from Procomer staff: sometimes deals did not materialize with the losers because losers were attending to other business at the exact moment at which the potential MNC buyer required their full attention.

Second, Figure A3 plots the relationship between the Procomer score of firms and their value added per worker (in thousands of U.S. dollars) in the year before the relevant "Productive Linkages" deal (i.e., the deal for which a given firm is either a winner or loser). The value added per worker is computed using administrative data alone. We make the distinction between losers and winners, to check whether there is any systematic difference in the assessment of losers vs. winners.



(a) Distributions of Scores (b) Within-Deal Differences in Scores

Figure A2: Robustness Check: Scores of Firms in the "Productive Linkages" Program

Notes: Figure A2 compares the Procomer scores of winning and losing firms in our sample of first-time deals with MNCs mediated through the "Productive Linkages" program of Procomer. Panel A2a shows the histogram of Procomer scores for winners (white bars) and losers (grey bars). Panel A2b presents a histogram of differences between winner and loser scores. This difference is constructed by subtracting from the score of the winner the average score of the losing contenders to the same deal.

Table A9: Comparison Between Winners and Losers in Year Before Deal

	Winners (1)	Losers (2)	Difference (3)
Number of Workers	43.79	69.06	-25.27
	(61.12)	(83.79)	(16.48)
Value-added per worker	13.30	19.48	-6.18
	(8.01)	(17.22)	(3.22)
Total transactions per worker	52.15	63.18	-11.03
	(42.60)	(77.27)	(14.66)
Number of buyers per worker	1.69	2.06	-0.37
	(1.51)	(2.91)	(0.55)
Procomer score	84.16	86.03	-1.88
	(10.48)	(7.33)	(1.74)

Notes: Table A9 presents summary statistics describing the 31 winners and 84 losers in the year prior to the relevant deal (deal won by the winner or deal to which the loser was a contender). Column (3) reports the difference between winners' and losers' values. Value-added per worker and total transactions per worker are measured in CPI-deflated 2013 U.S. dollars. Robust standard errors in parentheses.

We note that there is no systematic pattern assigning high scores to low value-added firms or vice versa. There is a clear positive correlation between the Procomer score and the value-added per worker, which means scores are informative on firm performance. That said, this correlation is far from 1. Rather than posing a problem, we interpret this to be evidence in favor of the usefulness of the Procomer score: its main advantage is that Procomer evaluates firms on features that are unobserved in our administrative data and that, while not reflected in the value-added per worker of the firm, are relevant to MNCs.

Third and last, MNCs were not obliged to purchase from any given supplier proposed by Procomer or to even purchase through Procomer to begin with. Moreover, a recurrent theme

during our interviews with Procomer staff was that of a need to build a strong positive reputation for domestic suppliers. Had firms undeserving of their score been added to shortlists, this would have jeopardized Procomer's attempt to create this positive reputation.

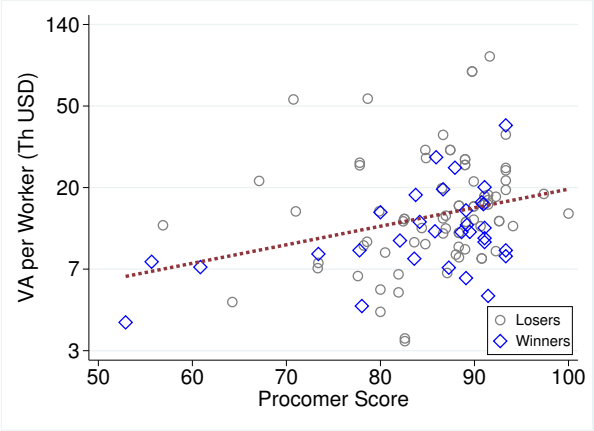


Figure A3: Relationship between Procomer Score and Value Added Per Worker

Notes: Figure A3 plots the relationship between the score assigned to firms by Procomer and their value added per worker (in thousands of CPI-deflated U.S. dollars) in the year before the relevant "Productive Linkages" deal (i.e., the deal for which a given firm is either a winner or loser). The figure makes the distinction between losers and winners, to investigate whether there is any systematic difference in the scoring of losers vs. winners. This figure only focuses on the sample of "Productive Linkages" deals used in the analysis.

Table A10 reports summary statistics on the first relationship with an MNC buyer mediated by the "Productive Linkages" program. We notice that these mediated relationships are comparable to those in our baseline sample of unmediated economy-wide first-time supplying relationships (see Table B4 in Online Appendix B).

Table A10: Descriptive Statistics of Relationship with First MNC Buyer For Winners in Sample of Deals Mediated by 'Productive Linkages" Program

	N	Mean	Median	S.D.
First transaction with MNC (thous. of U.S. dollars)	31	53.45	29.53	81.16
Length of relationship with first MNC buyer (years)	31	3.87	3.00	2.66

Notes: Table A10 provides descriptive statistics of the first relationship with an MNC mediated by the "Productive Linkages" program. The first row reports summary statistics of the amount sold to this MNC buyer in the first year of the relationship. The second row describes the overall length of this relationship (in years). These statistics characterize the sample of 31 "Productive Linkages" deals.

In our surveys, we asked domestic suppliers with deals through Procomer about why they sought such deals in addition to their unmediated deals (see Question 20 in Table F12, Online Appendix F.3). For 60% of these firms, Procomer granted better access to MNCs, for 53%, Procomer deals were no different from their other deals but provided another source of business, and for 40%, Procomer lent them credibility in front of MNCs. Hence, it seems that whether first deals with MNCs are mediated or not is not a first-order feature of deals.

Online Appendix B Summary Statistics for the Baseline Event-Study Sample

Table B1: Country of Global Ultimate Ownership for the MNCs Triggering the Event

Country of GUO	Frequency	Percentage
United States	206	46.4
Panama	30	6.8
Spain	17	3.8
Great Britain	17	3.8
Mexico	17	3.8
Switzerland	14	3.2
Colombia	13	2.9
Canada	11	2.5
Germany	11	2.5
France	11	2.5
...	...	...
Total	444	100

Notes: Table B1 documents the ten most frequent countries of global ultimate ownership (GUO) for the MNCs triggering the events in our baseline economy-wide sample. The countries of the GUO for the remaining 97 MNCs not reported in the table above are as follows: Japan (9 MNCs), Guatemala and El Salvador (8 MNCs each), Netherlands (7 MNCs), Ireland (6 MNCs), Venezuela (5 MNCs), Belgium, China and Nicaragua (4 MNCs each), Chile, Denmark, Honduras, Italy, South Korea, and Luxembourg (3 MNCs each), Australia, Brazil, Peru, and Sweden (2 MNCs each), and finally Austria, Bulgaria, Bermuda, Belize, Curaçao, Ecuador, Greece, Hong Kong, Hungary, Indonesia, India, Cayman Islands, Norway, Serbia, Singapore, and Trinidad and Tobago (1 MNC each). Each observation is a unique MNC. Since one MNC can trigger multiple events, each country's frequency in the sample of unique MNCs is likely to differ from the frequency of each country in the sample of events.

Table B2: Sectoral Composition of the Sample of First-Time Suppliers and MNCs

	Suppliers	MNCs
Agriculture, forestry and fishing	7.28	5.86
Manufacturing	11.17	38.06
Wholesale and retail trade	31.76	13.96
Transportation and storage	9.28	4.28
Accommodation and food services	6.36	5.86
Information and communication	3.60	6.76
Professional, scientific and technical	14.39	5.86
Administrative and support services	9.68	11.71
Human health and social work	1.76	0.23
Art, entertainment and recreation	1.05	0.45
Other services	3.35	0.23
Mining and quarrying	0.32	0.23
Water supply, sewerage and waste management	-	0.45
Construction	-	1.13
Real estate	-	4.05
Education	-	0.90

Notes: Table B2 presents the share of firms in a given sector of the 3,697 first-time suppliers to an MNC in the first column, and of their first 444 MNC buyers in the second column. Each firm from each sample is only repeated once (i.e., the frequency of the MNCs is that of the unique MNCs triggering the events, not of the events triggered by those MNCs). Both types of firms pertain to the baseline economy-wide sample.

Table B3: Summary Statistics for the Domestic Firms in the Baseline Economy-Wide Sample (First-Time Suppliers and Never-Suppliers to MNCs)

	First-time suppliers (1)	Never suppliers (2)
Time invariant characteristics		
Agriculture, forestry and fishing	0.0728	0.0808
	(0.26)	(0.27)
Manufacturing	0.112	0.0903
	(0.32)	(0.29)
Wholesale and retail trade	0.318	0.360
	(0.47)	(0.48)
Transportation and storage	0.0928	0.0504
	(0.29)	(0.22)
Accommodation and food services	0.0636	0.184
	(0.24)	(0.39)
Information and communication	0.0360	0.0238
	(0.19)	(0.15)
Professional, scientific and technical	0.144	0.0705
	(0.35)	(0.26)
Administrative and support service	0.0968	0.0612
	(0.30)	(0.24)
Human health and social work	0.0176	0.0324
	(0.13)	(0.18)
Art, entertainment and recreation	0.0105	0.0161
	(0.10)	(0.13)
Other services	0.0335	0.0298
	(0.18)	(0.17)
Mining and quarrying	0.00325	0.00105
	(0.06)	(0.03)
Entered before or in 2005	0.271	0.365
	(0.44)	(0.48)
Time variant characteristics		
Total sales (thous. U.S. dollars)	1,263.8	840.1
	(3,893.82)	(1,926.29)
Number of workers	16.87	13.27
	(42.66)	(31.43)
Total sales (thous. U.S. dollars) / worker	99.55	84.49
	(185.11)	(128.28)
Share of importers	0.286	0.189
	(0.45)	(0.39)
Share of exporters	0.060	0.031
	(0.24)	(0.17)
Number of buyers	12.08	6.36
	(40.45)	(20.31)
Duration (years) of trans. with buyers	1.99	1.98
	(0.75)	(1.10)
Sh. of sales sold to main buyer	0.18	0.19
	(0.23)	(0.29)
Number of firms	3,697	14,338

Notes: Table B3 presents descriptive statistics for the sample of first-time suppliers to MNCs (column (1)) and never-suppliers to MNCs (column (2)). For each sample of firms, we characterize their broad sector, whether they entered before or in 2005, total sales, number of workers, total sales per worker, share of importers and exporters, total number of buyers, the share of their sales sold to the main buyer of a given year, and their average duration across all their buyers. We compute the average duration only for relationships starting in or after 2010 (to maintain the comparability with relationships with MNCs). All other time-varying variables correspond to averages across time for each supplier. In the case of first-time suppliers to MNCs, to compute the averages we only use the years before their event. Standard deviations in parentheses.

Table B4: Characteristics of Amount and Length of Relationship with First MNC Buyer

Variable	N	Mean	Median	S.D.
First transaction with MNC ($\times$ 1,000 U.S. dollars)	3,697	62.37	18.58	110.25
Length of relationship with first MNC buyer	3,697	2.77	2.00	1.92
Length of relationship with all MNC buyers	3,697	3.71	3.00	2.12

Notes: Table B4 refers to all economy-wide domestic firms observed as supplying for the first time to an MNC in CR sometime between 2010 and 2015. The first line presents descriptive statistics of the first transaction with an MNC buyer. The second line describes the length of that relationship with the first MNC buyer, while the third line describes the length of relationships with all MNC buyers (including both the first MNC buyer and subsequent ones). Note that both of the duration variables are top censored, hence underestimated. For instance, for firms first supplying to an MNC in 2015 we can observe only two years more of their firm-to-firm transactions.

Table B5: Share of Sales Going to MNCs and Number of Other MNC Buyers

Event year	Number observed first-time suppliers (1)	Share sold to first MNC (2)	Share sold to other MNCs (3)	Number of other MNC buyers (4)
0	3,697	0.19	0.00	0.00
		(0.27)	(0.00)	(0.00)
+1	3,632	0.14	0.03	0.56
		(0.25)	(0.09)	(1.20)
+2	3,465	0.11	0.04	0.81
		(0.24)	(0.11)	(1.79)
+3	2,787	0.10	0.05	1.04
		(0.23)	(0.13)	(2.31)
+4	2,188	0.09	0.06	1.19
		(0.22)	(0.14)	(2.71)

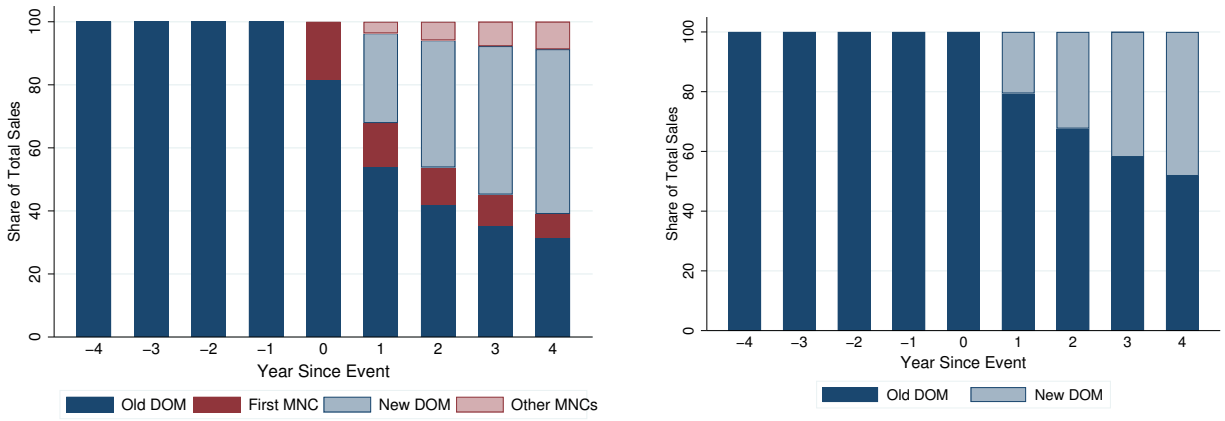
Notes: Table B5 provides additional descriptive statistics for first-time suppliers to MNCs. The first column presents the number of years after the event. For each event year, the first line reports the mean of each variable, and the second one reports the standard error in parenthesis. Column (1) reports the number of first-time suppliers that we still observe in each event year. Column (2) reports the share of sales sold to the first MNC buyer. Column (3) reports the share of sales sold to MNC buyers other than the one triggering the event. Column (4) reports the number of MNC buyers other than the one triggering the event. Whenever more than one MNC triggers the event, observations in column (2) include the share of sales sold to all those MNCs.

Online Appendix C Additional Evidence Using the Baseline Event-Study Sample

Table C1: Domestic Firms (Weakly) Reduce their Markups after Starting to Supply to MNCs

Outcome: Mark-up	(1)	(2)	(3)	(4)
Yearly effects				
4 years before event	0.007	0.063*	-0.004	0.005
	(0.032)	(0.036)	(0.014)	(0.017)
3 years before event	-0.007	0.027	-0.005	0.002
	(0.017)	(0.026)	(0.014)	(0.017)
2 years before event	0.002	0.022	-0.006	0.001
	(0.009)	(0.015)	(0.016)	(0.019)
Year of event	-0.008	-0.031*	-0.012	-0.006
	(0.015)	(0.017)	(0.014)	(0.018)
1 year after event	-0.018	-0.062**	-0.013	-0.015
	(0.012)	(0.024)	(0.013)	(0.019)
2 years after event	-0.022	-0.087***	-0.012	-0.022
	(0.015)	(0.029)	(0.013)	(0.019)
3 years after event	-0.029	-0.118***	-0.014	-0.026
	(0.020)	(0.034)	(0.013)	(0.020)
4 years after event	-0.034*	-0.143***	-0.014	-0.031
	(0.017)	(0.043)	(0.014)	(0.022)
Pooled effects				
Sampi et al. (2021) pooled	-	-	-0.013	-0.015
	-	-	(0.011)	(0.012)
Firm FE	Yes	Yes	-	-
Year-4DSect-Prov FE	Yes	Yes	-	-
Never Suppliers	Yes	No	Yes	No
Adjusted R^2	0.80	0.78	-	-
# Observations	50,062	10,803	54,706	13,657
# Fixed Effects	12,796	4,020	-	-
# Firms	8,658	1,868	7,477	1,864

Notes: Table C1 shows the effects of a first sale to an MNC on markups. In the upper panel, we report the coefficients for event years -4 to $+4$, where we normalize to zero the coefficients for the year before the event. Columns (1) and (3) report event-study estimates for the full sample, including both domestic firms that become first-time suppliers to an MNC after 2010 and domestic firms never observed as supplying to an MNC in our data. Columns (2) and (4) focus only on the restricted sample of domestic firms becoming first-time suppliers to an MNC after 2010. Columns (1) and (2) show the results of implementing the event-study specification (1) using firm-level markups as the dependent variable. In these two columns, we estimate markups using the methodology of De Loecker and Warzynski (2012) for a value-added Cobb–Douglas production function. In columns (1) and (2), we cluster standard errors at the two-digit sector by province level and event by province level, respectively. Columns (3) and (4) present our estimates using the method of Sampi et al. (2021). We thank James Sampi, Charl Jooste, and Ekaterina Vostroknutova for sharing their codes. In the row "Sampi et al. (2021) pooled" of the lower panel of these columns, we include the results from their exact method (which pools the data into before and after periods). The upper panel reports the entire path of event-study coefficients, where we adapt the methodology of Sampi et al. (2021) to an event-study setting. In column (3), we first assign a random event year to never-treated firms. We then compute the effect between event years k and -1 using the exact method of Sampi et al. (2021) for the sample including only observations from event years k and -1. In column (4), we follow the same procedure except that we exclude the never-suppliers and adapt the control group to include the pre-event observations for the eventually-supplier firms. Standard errors are computed using a bootstrap procedure. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.



(a) First-Time Suppliers to MNCs

(b) Never-Suppliers to MNCs

Figure C1: Split of Corporate Sales by Old or New, Domestic or MNC Buyers

Notes: Figure C1 reports the composition of total corporate sales (all sales tracked in the firm-to-firm transaction data) of first-time suppliers to MNCs (panel C1a) and never-suppliers (panel C1b) by event year. For first-time suppliers to MNCs, the event year 0 is the year when these firms have their first transaction with an MNC. To never-suppliers, we randomly assign a year of the event between 2010 and 2015 (the random draws come from a uniform distribution). We define an old buyer as a buyer to whom the supplier sells by its event year. For legibility, we bundle domestic firms, non-MNC but partially foreign-owned firms, and the government under the domestic buyers or DOM label. DOM buyers can be either old or new. We split MNC buyers into either the "First MNC" triggering the event or "Other MNCs" (all subsequent MNCs). By construction, never-suppliers do not ever have an MNC buyer. For each event year, we sum (across all suppliers) the transactions with all corporate buyers. Then we compute the shares in each buyer category over the total (aggregating across all suppliers). This is equivalent to computing the weighted average of the share of each supplier, weighted by its relative size (in terms of total corporate sales). Note that this figure has to study corporate sales (as opposed to total sales), as it is only in the firm-to-firm transaction data that one can establish whether a buyer is old or new and MNC or not.

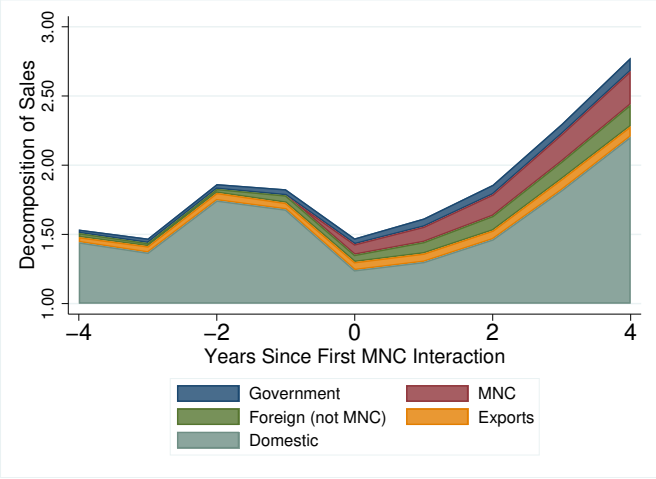


Figure C2: Decomposition of Total Sales for First-time Suppliers to MNCs

Notes: Figure C2 plots a decomposition of the total sales of first-time suppliers to MNCs. The horizontal axis refers to event years and the vertical axis to total sales in millions of U.S. dollars (CPI-deflated to 2013 dollars). For each event-year, we calculate the average amount in each category of buyers across all suppliers. We exclude the top 1% largest transactions to avoid outliers driving these averages. We split transactions into five categories: sales to MNCs, sales to partially foreign-owned firms that are not MNCs, exports, sales to the government, and sales to domestically-owned firms and domestic consumers (where this last category is constructed as the residual from the total sales minus the sales to MNCs, sales to partially foreign-owned firms that are not MNCs, exports, and sales to the government). These averages are not demeaned through any fixed effect.

Table C2: Sales and TFP Gains Vary by the Number of MNC Event Years

	Total Sales				TFP (Cobb Douglas, OLS)			
	At least 1 event year	1 event year only	2 event years only	3 or more event years only	At least 1 event year	1 event year only	2 event years only	3 or more event years only
	Baseline				Baseline			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4 years before event	0.044	-0.013	-0.082	0.100	0.016	0.036**	-0.050	-0.043
	(0.028)	(0.032)	(0.075)	(0.109)	(0.014)	(0.018)	(0.043)	(0.070)
3 years before event	0.029	-0.045	0.007	0.081	0.020**	0.012	0.007	0.011
	(0.023)	(0.030)	(0.054)	(0.087)	(0.010)	(0.014)	(0.021)	(0.033)
2 years before event	0.026	-0.020	0.022	0.063	0.015	0.005	0.013	0.045
	(0.018)	(0.021)	(0.043)	(0.053)	(0.010)	(0.011)	(0.024)	(0.033)
Year of event	0.159***	0.080***	0.241***	0.362***	0.059***	0.054***	0.042***	0.105***
	(0.019)	(0.021)	(0.044)	(0.038)	(0.009)	(0.011)	(0.013)	(0.021)
1 year after event	0.325***	0.133***	0.430***	0.715***	0.082***	0.059***	0.072***	0.157***
	(0.028)	(0.023)	(0.043)	(0.054)	(0.014)	(0.015)	(0.016)	(0.031)
2 years after event	0.351***	0.116***	0.415***	0.837***	0.088***	0.059***	0.067***	0.174***
	(0.032)	(0.023)	(0.047)	(0.061)	(0.011)	(0.014)	(0.016)	(0.029)
3 years after event	0.342***	0.081***	0.396***	0.848***	0.088***	0.068***	0.079***	0.153***
	(0.035)	(0.026)	(0.052)	(0.060)	(0.014)	(0.020)	(0.021)	(0.030)
4 years after event	0.334***	0.067**	0.361***	0.847***	0.086***	0.056**	0.085***	0.154***
	(0.037)	(0.027)	(0.053)	(0.063)	(0.015)	(0.022)	(0.019)	(0.028)
Mean Dep. Var. (level)	0.85	0.74	0.72	0.79	1.12	0.94	0.91	1.03
SD Dep. Var. (level)	2.54	1.83	1.77	2.44	3.17	2.15	2.04	2.98
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.77	0.76	0.75	0.76	0.95	0.95	0.95	0.95
# Observations	116,683	103,032	95,915	97,659	64,419	56,113	52,036	53,173
# Fixed Effects	25,174	22,632	21,398	21,738	15,464	13,548	12,640	13,069
# Firms	18,035	16,100	15,077	15,301	10,492	9,202	8,577	8,773

Notes: Table C2 studies the heterogeneity of the effects of supplying to MNCs on log total sales (columns (1) to (4)) and log TFP (estimated via OLS and assuming a Cobb–Douglas technology, columns (5) to (8)) by the number of event years. Our baseline event-study analysis narrowly defines the event year as the first year when a domestic firm supplies to an MNC buyer (irrespective of how many other MNCs this domestic firm ends up supplying to in later years). In contrast, in this table, a year with an event is any year in which a domestic firm starts supplying to a *new* MNC buyer (the first MNC buyer or a subsequent one). All treated firms in this exercise are first-time suppliers (i.e., firms that we observe before their first event year). Hence, their first event year is the event year in which they start supplying to their first MNC buyer. For each outcome, we present the baseline estimates from columns (1) and (5) in Table 1. These baseline estimates are in columns (1) and (5), respectively. The baseline estimates pertain to the sample in which all treated domestic firms have at least one event year (namely, the first event year). Columns (2) and (6) drop from the full sample all first-time suppliers that have other event years after the initial event year. Columns (3) and (7) drop from the full sample all first-time suppliers that have either only the initial event year or three or more event years. Columns (4) and (8) drop from the full sample the first-time suppliers that either have one event year only or two event years only. Put differently, we only keep the first-time suppliers that have at least three or more event years. All regressions include firm and two-digit sector $\times$ province $\times$ calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table C3: Pooled Changes in Sales and TFP After a First, Second, or Third Event Year

	Total Sales			TFP (Cobb Douglas, OLS)		
	After first event year	After second event year	After third event year	After first event year	After second event year	After third event year
	Baseline (1)	(2)	(3)	Baseline (4)	(5)	(6)
After	0.266*** (0.029)	0.382*** (0.033)	0.358*** (0.036)	0.066*** (0.010)	0.061*** (0.011)	0.048*** (0.012)
Mean Dep. Var. (level)	0.85	0.85	0.85	1.12	1.12	1.12
SD Dep. Var. (level)	2.54	2.54	2.54	3.17	3.17	3.17
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.77	0.77	0.77	0.95	0.95	0.95
# Observations	116,683	116,683	116,683	64,419	64,419	64,419
# Fixed Effects	25,174	25,174	25,174	15,464	15,464	15,464
# Firms	18,035	18,035	18,035	10,492	10,492	10,492

Notes: Table C3 estimates the pooled changes in outcomes after one, two, or three or more event years. Columns (1) to (3) study log total sales, while columns (4) to (6) look into log TFP (estimated via OLS and assuming a Cobb–Douglas technology). Our baseline event-study analysis narrowly defines the event year as the first year when a domestic firm supplies to an MNC buyer (irrespective of how many other MNCs this domestic firm ends up supplying to in later years). In contrast, in this table, a year with an event is any year in which a domestic firm starts supplying to a *new* MNC buyer (the first MNC buyer or a subsequent one). All treated firms in this exercise are first-time suppliers (i.e., firms that we observe before their first event year). Hence, their first event year is the event year in which they start supplying to their first MNC buyer. Columns (1) and (4) simply present the estimates from the pooled (after the first event year vs. before) version of the baseline event-study regressions in columns (1) and (5) in Table 1. Columns (2) and (5) drop the first-time suppliers that only have one event year and estimate a new pooled event-study regression where the year splitting the before vs. after periods is the second event year. Columns (3) and (6) drop the first-time suppliers that have strictly less than three event years and estimate a new pooled event-study regression where the year splitting the before vs. after periods is the third event year. All regressions include firm and two-digit sector $\times$ province $\times$ calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table C4: TFP Gains Vary by the Characteristics of the First MNC Buyer

	Median # workers		Median sales		Median purch.		Median sh. purch.	
	Below	Above	Below	Above	Below	Above	Below	Above
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4 years before event	-0.02	0.01	-0.07	0.01	-0.08	0.02	-0.01	0.00
	(0.06)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)
3 years before event	-0.02	-0.00	-0.04	-0.00	-0.04	0.00	0.01	-0.02
	(0.04)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)	(0.03)	(0.03)
2 years before event	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Year of event	0.05*	0.06***	0.06**	0.06***	0.08***	0.06***	0.08***	0.04**
	(0.03)	(0.01)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
1 year after event	0.10**	0.08***	0.11***	0.09***	0.11***	0.09***	0.10***	0.08***
	(0.04)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)	(0.03)	(0.03)
2 years after event	0.14**	0.08***	0.14***	0.09***	0.13**	0.09***	0.11***	0.10**
	(0.06)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)
3 years after event	0.15**	0.08**	0.15**	0.10**	0.16**	0.09**	0.12***	0.10*
	(0.07)	(0.04)	(0.06)	(0.04)	(0.07)	(0.04)	(0.05)	(0.05)
4 years after event	0.17**	0.08	0.22***	0.09*	0.20**	0.09*	0.12**	0.10
	(0.09)	(0.05)	(0.08)	(0.05)	(0.08)	(0.05)	(0.06)	(0.06)
Mean Dep. Var. (level)	1.75	2.08	1.68	2.08	1.69	2.05	1.81	2.09
SD Dep. Var. (level)	3.75	6.06	3.61	6.04	3.80	5.90	4.56	5.77
Adjusted R^2	0.96	0.96	0.97	0.96	0.97	0.96	0.96	0.96
# Observations	3,256	11,574	3,144	11,778	2,576	12,422	7,709	7,085
# Fixed Effects	1,041	3,022	994	3,086	855	3,211	2,196	1,963
# Firms	510	1,778	473	1,824	376	1,936	1,204	1,082

Notes: Table C4 presents the heterogeneity of TFP gains by characteristics of the affiliate in CR of the first MNC buyer triggering the event. All columns report results from running the event-study specification (1) adapted to the Cobb–Douglas OLS measure of TFP. Regressions differ in the sample over which the regression is run. Columns (1) and (2) separate domestic firms based on the size of their first MNC buyer in CR, measured in average number of workers. We first compute the average number of workers of each first MNC buyer (across all years of activity). Then we split the set of first MNC buyers that triggered an event into two groups: below (column (1)) or above (column (2)) the median of the distribution of average number of workers of the first MNC buyers. There are more domestic firms whose first MNC buyer has above the median number of workers because larger MNCs tend to have more suppliers. Columns (3) and (4) also separate domestic firms based on the size of their first MNC buyer in CR, this time measured as average total sales. Columns (5) and (6) separate domestic firms based on their total input purchases in CR (as tracked by the firm-to-firm transaction data). The three characteristics so far – average number of workers, average total sales, and average total input purchases – are positively correlated measures of firm size. Columns (7) and (8) separate domestic firms based on the share of their total inputs that are purchased in CR. We compute this share as the (total inputs purchased in CR) / (total imports + total inputs purchased in CR). All columns focus only on the restricted sample of first-time suppliers because it is only in that sample that we can separate firms based on the characteristics of their first MNC buyer (never-suppliers do not have a first MNC buyer). All regressions include firm and two-digit sector $\times$ province $\times$ calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table C5: TFP Gains Vary by the HQ Country of the First MNC Buyer

	Region of HQ country				GDP per capita PPP		Quality of management	
	USA-Canada	Europe	Asia-Pacific	LAC	Below med.	Above med.	Below med.	Above med.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4 years before event	-0.08**	0.09	0.01	0.05	-0.01	-0.02	0.06	-0.06*
	(0.04)	(0.07)	(0.06)	(0.18)	(0.05)	(0.03)	(0.08)	(0.04)
3 years before event	-0.04	0.07	0.00	0.08	-0.01	-0.01	0.02	-0.03
	(0.03)	(0.05)	(0.04)	(0.11)	(0.04)	(0.02)	(0.05)	(0.03)
2 years before event	-0.00	0.04	0.02	0.07	0.01	0.02	0.04	0.01
	(0.02)	(0.03)	(0.03)	(0.07)	(0.02)	(0.02)	(0.03)	(0.02)
Year of event	0.09***	0.04	0.03	0.18**	0.03	0.08***	0.01	0.09***
	(0.02)	(0.03)	(0.03)	(0.08)	(0.02)	(0.02)	(0.03)	(0.02)
1 year after event	0.13***	0.07	0.08*	0.12	0.08**	0.11***	0.06	0.12***
	(0.03)	(0.04)	(0.04)	(0.10)	(0.04)	(0.02)	(0.05)	(0.03)
2 years after event	0.15***	0.06	0.09	0.07	0.10*	0.12***	0.05	0.13***
	(0.04)	(0.06)	(0.06)	(0.14)	(0.05)	(0.03)	(0.07)	(0.03)
3 years after event	0.18***	0.05	0.08	0.08	0.08	0.14***	0.04	0.15***
	(0.05)	(0.08)	(0.07)	(0.18)	(0.07)	(0.04)	(0.09)	(0.04)
4 years after event	0.19***	0.04	0.10	0.14	0.11	0.14***	0.04	0.16***
	(0.06)	(0.09)	(0.09)	(0.21)	(0.08)	(0.05)	(0.11)	(0.05)
Mean Dep. Var. (level)	1.84	1.70	2.20	1.51	2.07	1.84	2.21	1.90
SD Dep. Var. (level)	4.55	4.41	5.37	2.65	5.07	5.08	5.86	5.20
Adjusted R^2	0.97	0.97	0.96	0.95	0.96	0.96	0.96	0.96
# Observations	5,918	3,028	4,430	622	5,043	9,645	2,995	7,636
# Fixed Effects	1,706	1,095	1,332	246	1,499	2,630	987	2,150
# Firms	906	486	685	101	781	1,484	461	1,185

Notes: Table C5 presents the heterogeneity of TFP gains by characteristics of the headquarter (HQ) country of the first MNC buyer triggering the event. All columns report results from running the event-study specification (1) adapted to the Cobb–Douglas OLS measure of TFP. Regressions differ in the sample over which the regression is run. Columns (1) to (4) separate domestic firms based on the region of the HQ country of the first MNC buyer. We split countries by their geographic proximity into four groups: USA-Canada, Europe, Asia-Pacific, and Latin America and the Caribbean (LAC). Columns (5) and (6) separate domestic firms based on the GDP per capita PPP of the HQ country of the first MNC buyer. The split is with respect to the median GDP per capita across the HQ countries in our sample. The HQ countries whose GDP per capita is below median are: Nicaragua, Honduras, India, Belize, Guatemala, El Salvador, Ecuador, Indonesia, Peru, Brazil, Colombia, China, Venezuela, Serbia, Mexico, Bulgaria, Chile, Trinidad and Tobago, Greece, Panama, Hungary, Puerto Rico, and Israel. The HQ countries whose GDP per capita is above median are: Spain, South Korea, Japan, Italy, UK, France, Canada, Australia, Belgium, Sweden, Germany, Austria, Bermuda, Netherlands, Denmark, Hong Kong, USA, Norway, Switzerland, Cayman Islands, Ireland, Singapore, and Luxembourg. Columns (7) and (8) separate domestic firms based on the quality of management of the HQ country of the first MNC buyer. We start with the firm-level data from the World Management Survey (WMS), which collected data for 35 countries. To compute a quality management score per country, we compute a weighted average of the variable "management" (the average of all management questions) where the weights are the number of workers of each firm. The number of workers comes in five categories: a) 50-100, b) 101-250, c) 251-500, d) 501-1000, and e) 1001-*. We use the lower bound of each interval as the number of workers for the weights. Only 20 of our HQ countries are in the WMS data. We split these countries into two groups based on whether their WMS score is above or below the median quality of management across those 20 countries. The countries whose quality of management is below the median are Nicaragua, India, China, Colombia, Brazil, Ireland, Greece, Spain, Chile, and Mexico. The countries whose quality of management is above the median are Australia, France, Italy, UK, Singapore, Sweden, Canada, Germany, Japan, and the USA. The number of observations above the median is higher because above-median countries have more MNCs settled in CR and more suppliers. Note that all these separations can only be done in the restricted sample, as never-suppliers do not have a first MNC buyer. Hence, all columns pertain to the restricted sample including only firms that become first-time suppliers to an MNC between 2010 and 2015. All regressions include firm and two-digit sector × province × calendar year fixed effects. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D Robustness of Baseline Estimates

Online Appendix D.1 Robustness of Baseline Estimates to Alternative Empirical Strategies

Table D1: Baseline Event-Study Estimates Are Robust to Four Alternative Empirical Strategies

	"Productive Linkages" Design			Predicted Procomer Score			Propensity Score Matching			Nearest Neighbors Matching		
	Number Workers	Number Other Corp. Buyers	Average Corp. Sales to Others	Number Workers	Number Other Corp. Buyers	Average Corp. Sales w/ Others	Number Workers	Number Other Corp. Buyers	Average Corp. Sales to Others	Number Workers	Number Other Corp. Buyers	Average Corp. Sales to Others
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.077	-0.036	0.017	0.100***	-0.018	0.064	0.084***	0.022	0.068	-0.018	-0.012	0.006
	(0.161)	(0.141)	(0.169)	(0.025)	(0.038)	(0.066)	(0.026)	(0.040)	(0.062)	[-0.079,0.090]	[-0.138,0.170]	[-0.116,0.175]
3 years before event	0.043	-0.030	0.039	0.071***	0.007	0.058	0.057**	0.044	0.086*	-0.026	-0.004	0.001
	(0.152)	(0.117)	(0.178)	(0.023)	(0.031)	(0.049)	(0.024)	(0.033)	(0.050)	[-0.069,0.056]	[-0.088,0.117]	[-0.103,0.100]
2 years before event	-0.040	-0.039	-0.037	0.044***	0.012	0.047*	0.041**	0.037	0.051*	-0.029	-0.014	-0.016
	(0.148)	(0.108)	(0.132)	(0.016)	(0.025)	(0.024)	(0.018)	(0.029)	(0.027)	[-0.060,0.023]	[-0.069,0.051]	[-0.080,0.053]
Year of event	0.126	0.048	-0.040	0.080***	0.047**	-0.746**	0.039*	0.018	-0.781***	0.087***	0.018	-1.305***
	(0.131)	(0.102)	(0.134)	(0.016)	(0.018)	(0.059)	(0.022)	(0.022)	(0.056)	[0.031,0.109]	[-0.053,0.064]	[-1.687,-1.126]
1 year after event	0.063	0.148	-0.060	0.228***	0.234***	-0.055	0.108***	0.190***	-0.105***	0.207***	0.271***	-0.203***
	(0.115)	(0.104)	(0.128)	(0.024)	(0.018)	(0.046)	(0.022)	(0.022)	(0.037)	[0.160,0.247]	[0.191,0.324]	[-0.439,-0.096]
2 years after event	0.227*	0.254**	0.104	0.288***	0.297***	0.048	0.141***	0.235***	-0.006	0.251***	0.353***	-0.103**
	(0.118)	(0.103)	(0.120)	(0.030)	(0.028)	(0.053)	(0.022)	(0.028)	(0.049)	[0.202,0.301]	[0.265,0.403]	[-0.345,-0.002]
3 years after event	0.249*	0.179*	-0.059	0.328***	0.340***	0.178**	0.161***	0.275***	0.138*	0.258***	0.398***	-0.023
	(0.130)	(0.100)	(0.130)	(0.034)	(0.026)	(0.066)	(0.026)	(0.028)	(0.072)	[0.204,0.320]	[0.300,0.459]	[-0.190,0.087]
4 years after event	0.169	0.183	-0.042	0.344***	0.346***	0.153***	0.173***	0.278***	0.108**	0.290***	0.394***	-0.041
	(0.123)	(0.120)	(0.121)	(0.037)	(0.028)	(0.048)	(0.030)	(0.031)	(0.052)	[0.226,0.366]	[0.277,0.471]	[-0.225,0.093]
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Year FE	Yes	Yes	Yes	No	No	No	No	No	No	n/a	n/a	n/a
Year-4DSect-Prov FE	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Adjusted R^2	0.88	0.91	0.57	0.79	0.87	0.63	0.78	0.88	0.63	n/a	n/a	n/a
# Observations	1,097	1,072	1,072	107,135	71,083	71,083	98,393	70,903	70,903	91,100	72,116	72,123
# Fixed Effects	123	123	123	15,470	12,540	12,540	14,888	12,275	12,275	n/a	n/a	n/a
# Treated	31	31	31	3,606	3,383	3,383	3,599	3,380	3,380	3,670	3,252	3,254
# Control	84	84	84	10,814	8,096	8,096	10,811	8,632	8,632	11,010	9,756	9,762

Notes: Table D1 contains robustness checks to the baseline results reported in Tables 1 and 2. These exercises employ the four alternative empirical strategies described in Section 3.2, each for three outcomes (all in logs): number of workers, number of other corporate buyers and average transactions with other corporate buyers (i.e., average sales to other corporate buyers). Columns (1) to (3) present the results from the "Productive Linkages" design, columns (4) to (6) those from the "predicted Procomer scores" matching, columns (7) to (9) those from the propensity score matching, and columns (10) to (12) those from the nearest neighbors matching. Regressions in columns (1) to (3) include firm, deal, and year fixed effects. Regressions in columns (4) to (12) include firm and four-digit sector $\times$ province $\times$ calendar year fixed effects. For columns (1) to (9), robust standard errors are in parentheses. For the nearest neighbors matching, 95 percent confidence intervals, given in brackets and statistical significance levels are constructed via subsampling. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D2: Auxiliary Table for the Propensity Score and Predicted Procomer Score Matching

	Baseline		Propensity Score Matching				Predicted Procomer Score Matching			
	Treated (1)	Control (2)	Probit (3)	Treated (4)	Control (5)	Diff (6)	Reg (7)	Treated (8)	Control (9)	Diff (10)
Agriculture, Forestry and Fishing	0.0919	0.0728		0.0736	0.0736	0		0.0736	0.0736	0
	(0.29)	(0.26)		(0.26)	(0.26)	(0.00)		(0.26)	(0.26)	(0.00)
Manufacturing	0.0993	0.112		0.103	0.103	0		0.103	0.103	0
	(0.30)	(0.32)		(0.30)	(0.30)	(0.00)		(0.30)	(0.30)	(0.00)
Wholesale and Retail Trade	0.363	0.318		0.320	0.320	0		0.320	0.320	0
	(0.48)	(0.47)		(0.47)	(0.47)	(0.00)		(0.47)	(0.47)	(0.00)
Transportation and Storage	0.0504	0.0928		0.0945	0.0945	0		0.0945	0.0945	0
	(0.22)	(0.29)		(0.29)	(0.29)	(0.00)		(0.29)	(0.29)	(0.00)
Accommodation and Food Services	0.175	0.0636		0.0648	0.0648	0		0.0648	0.0648	0
	(0.38)	(0.24)		(0.25)	(0.25)	(0.00)		(0.25)	(0.25)	(0.00)
Information and Communication	0.0197	0.0360		0.0344	0.0344	0		0.0344	0.0344	0
	(0.14)	(0.19)		(0.18)	(0.18)	(0.00)		(0.18)	(0.18)	(0.00)
Professional, Scientific and Technical	0.0626	0.144		0.147	0.147	0		0.147	0.147	0
	(0.24)	(0.35)		(0.35)	(0.35)	(0.00)		(0.35)	(0.35)	(0.00)
Administrative and Support Services	0.0597	0.0968		0.0986	0.0986	0		0.0986	0.0986	0
	(0.24)	(0.30)		(0.30)	(0.30)	(0.00)		(0.30)	(0.30)	(0.00)
Human Health and Social Work	0.0366	0.0176		0.0179	0.0179	0		0.0179	0.0179	0
	(0.19)	(0.13)		(0.13)	(0.13)	(0.00)		(0.13)	(0.13)	(0.00)
Art, Entertainment and Recreation	0.0153	0.0105		0.0102	0.0102	0		0.0102	0.0102	0
	(0.12)	(0.10)		(0.10)	(0.10)	(0.00)		(0.10)	(0.10)	(0.00)
Other Services	0.0253	0.0335		0.0339	0.0339	0		0.0339	0.0339	0
	(0.16)	(0.18)		(0.18)	(0.18)	(0.00)		(0.18)	(0.18)	(0.00)
Mining and Quarrying	0.00109	0.00325		0.00331	0.00331	0		0.00331	0.00331	0
	(0.03)	(0.06)		(0.06)	(0.06)	(0.00)		(0.06)	(0.06)	(0.00)
Located in San Jose	0.453	0.454		0.448	0.453	-0.00459		0.482	0.453	0.0296**
	(0.50)	(0.50)		(0.50)	(0.50)	(0.01)		(0.50)	(0.50)	(0.01)
Log Sales	5.136	5.402	0.071***	5.242	5.400	-0.158***	2.407***	5.223	5.400	-0.178***
	(1.05)	(1.19)	(0.011)	(1.15)	(1.18)	(0.02)	(0.754)	(1.08)	(1.18)	(0.02)
Log Number of Workers	1.926	1.978	-0.098***	1.882	1.974	-0.0924***	0.509	2.011	1.974	0.0368*
	(0.85)	(1.04)	(0.013)	(0.90)	(1.04)	(0.02)	(0.780)	(0.92)	(1.04)	(0.02)
Average Wages	14.85	14.91	0.004	14.90	14.91	0.00576	1.955	14.90	14.91	-0.00965
	(0.46)	(0.51)	(0.020)	(0.52)	(0.51)	(0.01)	(1.330)	(0.48)	(0.51)	(0.01)
Share of College Workers	0.0620	0.0875	0.134**	0.0822	0.0875	-0.00529	0.971	0.0707	0.0875	-0.0168***
	(0.13)	(0.18)	(0.058)	(0.18)	(0.18)	(0.00)	(3.186)	(0.16)	(0.18)	(0.00)
Workers w/ Exp. at Supp. of MNCs	0.413	0.666	0.213***	0.660	0.666	0.00597	-1.386	0.504	0.666	-0.161***
	(0.49)	(0.47)	(0.021)	(0.47)	(0.47)	(0.01)	(1.668)	(0.50)	(0.47)	(0.01)
Workers w/ Exp. at MNCs	0.439	0.582	0.084***	0.575	0.582	0.00689*	1.021	0.508	0.582	-0.0744***
	(0.50)	(0.49)	(0.019)	(0.49)	(0.49)	(0.01)	(1.570)	(0.50)	(0.49)	(0.01)
Year of Firm Entry	2007.7	2009.4	0.100***	2009.4	2009.5	0.503**	0.664***	2008.0	2009.5	-1.415***
	(3.26)	(3.39)	(0.003)	(3.14)	(3.39)	(0.06)	(0.254)	(3.08)	(3.39)	(0.06)
Exporter	0.0231	0.0622	0.045	0.0417	0.0579	-0.0162***	0.472	0.0337	0.0579	-0.0242***
	(0.15)	(0.24)	(0.039)	(0.20)	(0.23)	(0.00)	(1.481)	(0.18)	(0.23)	(0.00)
Importer	0.159	0.288	0.180***	0.235	0.284	-0.0497***	2.019	0.191	0.284	-0.0937***
	(0.37)	(0.45)	(0.022)	(0.42)	(0.45)	(0.01)	(1.518)	(0.18)	(0.23)	(0.00)
Supplies to a Big Domestic Firm	0.0811	0.317	0.239***	0.213	0.315	-0.103***	-3.388*	0.0966	0.315	-0.219***
	(0.27)	(0.47)	(0.022)	(0.41)	(0.46)	(0.01)	(1.943)	(0.30)	(0.46)	(0.01)
Supplies to an Exporter	0.0389	0.182	0.145***	0.0969	0.181	-0.0841***	-3.190*	0.0429	0.181	-0.138***
	(0.19)	(0.39)	(0.026)	(0.30)	(0.39)	(0.01)	(1.885)	(0.20)	(0.39)	(0.00)
Number of Suppliers	2.889	3.988	0.009***	3.217	3.984	-0.767***	-0.052	2.761	3.984	-1.223***
	(5.41)	(7.37)	(0.001)	(6.17)	(7.35)	(0.12)	(0.049)	(5.55)	(7.35)	(0.12)
Number of Buyers	3.954	12.38	0.001**	6.917	12.39	-5.477***	-0.003	5.186	12.39	-7.209***
	(16.67)	(32.30)	(0.000)	(21.10)	(32.52)	(0.47)	(0.018)	(17.68)	(32.52)	(0.43)
Av. Duration w/ Buyers (Years)	1.157	1.436	0.037***	1.297	1.421	-0.124***	0.260	1.359	1.421	-0.0617***
	(1.81)	(1.05)	(0.008)	(1.28)	(0.68)	(0.02)	(0.699)	(1.51)	(0.68)	(0.03)
Procomer Score								72.09	72.28	-0.0185*
								(3.67)	(4.04)	(0.07)
# Controls	14,338	14,338		10,887	10,887	10,887		10,887	10,887	10,887
# Treated	3,697	3,697		3,629	3,629	3,629		3,629	3,629	3,629
# Observations in Regression			119,552				630			

Notes: Table D2 presents the auxiliary regressions (columns (3) and (7)) and the comparisons between treated and control firms for the propensity score matching (PSM, columns (4) to (6)) and predicted Procomer scores matching (columns (8) to (10)). All descriptive statistics pertain to the year of the event. For reference, columns (1) and (2) present the averages for the baseline economy-wide full sample, including both domestic firms that become first-time suppliers to an MNC and domestic firms never observed as supplying to an MNC in our sample period. Column (3) presents the coefficients from the probit model where the outcome variable is the conditional probability of being chosen as a first-time supplier to an MNC in a given year. All the firm-specific controls are contemporaneous. The probit specification also controls for four-digit sector, year and province FEs. Columns (4), (5), and (6) compare the treated and control samples for the PSM specification. Column (7) presents the coefficients from a regression of the Procomer scores on a set of firm characteristics (all contemporaneous). This regression also controls for twenty broad-sector FEs. We then use the estimated coefficients to predict Procomer scores for all firm-years in the economy-wide sample. Columns (8), (9), and (10) compare the treated and control samples for the Predicted Procomer scores specification. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D3: "Productive Linkages" Design: Event Study Patterns for "Losers"

	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)
4 years before event	-0.199	-0.145	0.019	0.053	-0.204	0.257
	(0.277)	(0.204)	(0.112)	(0.264)	(0.152)	(0.157)
3 years before event	-0.119	-0.100	0.037	0.033	-0.138	0.171
	(0.205)	(0.151)	(0.084)	(0.194)	(0.109)	(0.125)
2 years before event	-0.048	-0.074	0.017	0.041	-0.056	0.096
	(0.133)	(0.102)	(0.064)	(0.135)	(0.080)	(0.090)
Year of event	-0.010	-0.040	-0.022	-0.200	0.005	-0.206**
	(0.123)	(0.103)	(0.060)	(0.134)	(0.077)	(0.086)
1 year after event	-0.038	-0.038	-0.030	-0.038	0.075	-0.113
	(0.179)	(0.127)	(0.080)	(0.176)	(0.096)	(0.115)
2 years after event	-0.101	-0.116	-0.045	-0.233	0.060	-0.293*
	(0.250)	(0.183)	(0.107)	(0.259)	(0.136)	(0.167)
3 years after event	0.018	-0.137	-0.006	-0.180	0.120	-0.300
	(0.323)	(0.238)	(0.136)	(0.326)	(0.170)	(0.210)
4 years after event	0.041	-0.074	-0.005	-0.228	0.159	-0.387
	(0.386)	(0.286)	(0.165)	(0.388)	(0.205)	(0.246)
Adjusted R^2	0.83	0.88	0.96	0.81	0.91	0.56
# Observations	1,111	1,097	1,087	1,072	1,072	1,072
# Treated	31	31	31	31	31	31
# Control	84	84	84	84	84	84

Notes: Table D3 contains a robustness check to the baseline event-study results presented in Tables 1 and 2. This table focuses on the "Productive Linkages" research design. We show the findings for six dependent variables: log total sales, log number of workers, log TFP residual from an OLS regression that assumes a Cobb–Douglas technology, log corporate sales to others, log number of other corporate buyers, and log average sales to other corporate buyers. The six columns report the estimates for the θ_k^L coefficients (see equation (2)). These coefficients measure the effects of the event on the outcomes of the "losers" to a given deal (i.e., the other firms shortlisted for a deal through "Productive Linkages"). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.1.1 More Details on Nearest Neighbors Matching

Denote the outcome of the first-time supplier i at event-time k as $Y_{i,k}$. Let $Y_{i,k}(1) = Y_{i,k}$ be the observable outcome of firm i at event-time k when treated and $Y_{i,k}(0)$ be the counterfactual outcome corresponding to the same event-time k but in the absence of the event.[xvii] We use the control firms to create an estimate of $\hat{Y}_{i,k}(0)$. Let $\mathcal{J}_n(i)$ be the set of the n nearest neighbors of firm i. We denote $\hat{Y}_{i,k}(0)$ as:

$$\hat{Y}_{i,k}(0) = \frac{1}{n} \sum_{j \in \mathcal{J}_n(i)} Y_{j,k}(0),$$

where $Y_{j,k}(0)$ is the observed outcome of firm j corresponding to event-time k associated with firm i. We compute the difference in difference estimate $\hat{\beta}_{i,k}$ by netting out the average difference between treated and control firms in the year prior to the event. This means that:

$$\hat{\beta}_{i,k} = Y_{i,k}(1) - \hat{Y}_{i,k}(0) - (Y_{i,-1}(1) - \hat{Y}_{i,-1}(0))$$

Let N_1 be the total number of treated firms. The average impact at event-time k is just the mean of the firm-specific treatment effects:

$$\hat{\beta}_k = \frac{1}{N_1} \sum_{i=1}^{N} \hat{\beta}_{i,k}$$

We implement a subsampling procedure to construct confidence intervals.[xviii] In particular we use $N_b = 500$ subsamples. For each subsample, we select without replacement $B_1 = R\sqrt{N_1}$ treated firms and $B_0 = R(N_0/\sqrt{N_1})$ control firms, where N_0 is the total number of potential control firms and R is a turning parameter (Politis and Romano, 1994; Deryugina et al., 2020).[xix] The estimated CDF of $\hat{\beta}_k$ is given by:

$$\hat{F}(x) = \frac{1}{N_b} \sum_{b=1}^{N_b} \mathbf{1}[\frac{\sqrt{B_1}}{\sqrt{N_1}}(\hat{\beta}_k^b - \hat{\beta}_k) + \hat{\beta}_k < x]$$

The confidence interval is then: $[\hat{F}^{-1}(0.025), \hat{F}^{-1}(0.975)]$.

For more details, see Abadie and Imbens (2006) for the theory and Deryugina et al. (2020) for an application.

[xvii] For each year, we standardize the outcome variables by computing a z-score. We first subtract the yearly average and then divide by the standard deviation (both across all firms in the economy that year).

[xviii] We use subsampling as opposed to bootstrap since the bootstrap fails for nearest neighbor matching due to the non-smoothness of the nearest neighbor function. However, the subsampling methods in Politis and Romano (1994) remains as a valid inferential method (Abadie and Imbens, 2008).

[xix] We use $R = 3$ as in Deryugina et al. (2020). However, results are also similar for $R = 5$ and $R = 10$.

Online Appendix D.2 Robustness of Baseline Estimates to Alternative Control Groups

Table D4: Robustness of Baseline Estimates to Dropping All Never-Supplying Firms from the Control Group

	Firm Size			TFP		Business with Others			
	Total Sales (1)	Number Workers (2)	Input Costs (3)	CD OLS (4)	ACF (2015) (5)	Sales to to Others (6)	Corp. Sales to Others (7)	Number Other Corp. Buyers (8)	Average Corp. Sales to Others (9)
4 years before event	-0.022	-0.054	0.003	-0.012	0.027	-0.047	-0.139	-0.042	-0.096
	(0.053)	(0.049)	(0.069)	(0.022)	(0.020)	(0.119)	(0.148)	(0.048)	(0.137)
3 years before event	0.001	-0.027	0.057	-0.004	0.032*	-0.041	-0.103	-0.014	-0.088
	(0.041)	(0.035)	(0.049)	(0.015)	(0.016)	(0.076)	(0.100)	(0.033)	(0.094)
2 years before event	0.007	-0.010	0.036	0.010	0.013	-0.028	-0.029	0.002	-0.031
	(0.023)	(0.019)	(0.030)	(0.013)	(0.011)	(0.036)	(0.045)	(0.022)	(0.048)
Year of event	0.191***	0.088***	0.110***	0.061***	0.043***	-0.122*	-0.636***	0.031	-0.667***
	(0.021)	(0.019)	(0.026)	(0.009)	(0.008)	(0.062)	(0.074)	(0.022)	(0.071)
1 year after event	0.377***	0.286***	0.252***	0.090***	0.053***	0.205**	0.295***	0.226***	0.069
	(0.035)	(0.031)	(0.044)	(0.013)	(0.013)	(0.090)	(0.095)	(0.034)	(0.089)
2 years after event	0.408***	0.317***	0.255***	0.097***	0.050***	0.320***	0.484***	0.282***	0.202*
	(0.054)	(0.046)	(0.072)	(0.017)	(0.017)	(0.115)	(0.121)	(0.047)	(0.112)
3 years after event	0.389***	0.313***	0.241**	0.101***	0.041*	0.333**	0.683***	0.312***	0.370**
	(0.072)	(0.061)	(0.095)	(0.021)	(0.021)	(0.147)	(0.164)	(0.061)	(0.161)
4 years after event	0.382***	0.295***	0.252**	0.099***	0.036	0.380**	0.704***	0.321***	0.383*
	(0.089)	(0.074)	(0.115)	(0.027)	(0.027)	(0.171)	(0.201)	(0.073)	(0.191)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var. (level)	1.45	18.9	1.40	2.00	-0.00	1.42	0.56	19.1	0.033
SD Dep. Var. (level)	4.50	45.1	4.74	5.74	0.34	4.51	1.81	57.7	0.045
Adjusted R^2	0.80	0.77	0.86	0.96	0.64	0.64	0.59	0.84	0.51
# Observations	23,961	23,961	14,199	13,706	13,706	23,801	20,491	20,491	20,491
# Fixed Effects	7,366	7,366	4,870	4,774	4,774	7,328	6,742	6,742	6,742
# Firms	3,482	3,482	2,195	2,144	2,144	3,468	3,291	3,291	3,291

Notes: Table D4 shows the results of running the event-study specification (1) for nine of our most important outcome variables. These results differ from those in Tables 1 and 2 in the sample of firms allowed in the control group. All columns report event-study estimates for the restricted sample of domestic firms becoming first-time suppliers to an MNC between 2010 and 2015 (i.e., the baseline sample from which we have excluded all never-suppliers to an MNC). The first three outcome variables are measures of firm size: log total sales (column (1)), log number of workers (column (2)) and log input costs (as a proxy for materials, column (3)). Columns (4) and (5) consider two measures of TFP. Column (4) uses a measure of TFP resulting from OLS production function estimation and assumes a Cobb–Douglas technology, with revenues (CPI-deflated to 2013 U.S. dollars) as the output measure and total net assets, number of workers, and input costs as input measures for K, L, and M respectively. Column (5) shows the results of production function estimation following Ackerberg et al. (2015). Columns (6) to (9) study the performance of firms in their business with other buyers. Column (6) studies the log sales to others (sales to all buyers *except* the first MNC buyer). Column (7) studies the log transactions to others (sales to all corporate buyers *except* the first MNC buyer). Column (8) studies the log number of other corporate buyers + 1 (number of corporate buyers tracked by the firm-to-firm transaction data, *except* the first MNC buyer, + 1). Finally, column (9) studies the log average sales to other corporate buyers (total sales to other corporate buyers, divided by the number of other corporate buyers, *except* the first MNC buyer, +1). All columns use standard error clustering at event-by-province level. Event year clustering is recommended whenever event dates are concentrated on a few values, as in our case from 2010 to 2015. Except for the number of workers and the number of buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D5: Robustness of Baseline Estimates to Restricting the Control Group to Only Include Suppliers to Large Firms

	Firm Size			TFP		Business with Others			
	Total Sales (1)	Number Workers (2)	Input Costs (3)	CD OLS (4)	ACF (2015) (5)	Sales to to Others (6)	Corp. Sales to Others (7)	Number Other Corp. Buyers (8)	Average Corp. Sales to Others (9)
4 years before event	0.021	0.003	-0.001	0.008	0.012	0.007	0.058	-0.023	0.081
	(0.041)	(0.033)	(0.058)	(0.017)	(0.015)	(0.055)	(0.086)	(0.035)	(0.061)
3 years before event	0.016	-0.004	0.049	0.014	0.022*	-0.019	0.027	-0.006	0.033
	(0.029)	(0.022)	(0.038)	(0.013)	(0.013)	(0.041)	(0.053)	(0.027)	(0.042)
2 years before event	0.018	0.006	0.028	0.012	0.006	-0.018	0.037	0.004	0.033
	(0.023)	(0.014)	(0.025)	(0.011)	(0.010)	(0.034)	(0.033)	(0.018)	(0.027)
Year of event	0.168***	0.064***	0.097***	0.058***	0.045***	-0.165***	-0.701***	0.027*	-0.728***
	(0.021)	(0.024)	(0.027)	(0.010)	(0.008)	(0.051)	(0.092)	(0.016)	(0.082)
1 year after event	0.343***	0.244***	0.228***	0.087***	0.061***	0.138**	0.154**	0.219***	-0.065
	(0.033)	(0.032)	(0.031)	(0.015)	(0.011)	(0.058)	(0.066)	(0.018)	(0.058)
2 years after event	0.369***	0.266***	0.231***	0.095***	0.069***	0.231***	0.277***	0.269***	0.009
	(0.035)	(0.035)	(0.041)	(0.013)	(0.011)	(0.048)	(0.076)	(0.022)	(0.068)
3 years after event	0.346***	0.251***	0.210***	0.097***	0.065***	0.211***	0.404***	0.292***	0.112*
	(0.038)	(0.037)	(0.053)	(0.016)	(0.012)	(0.049)	(0.071)	(0.026)	(0.062)
4 years after event	0.342***	0.224***	0.230***	0.094***	0.066***	0.237***	0.358***	0.291***	0.067
	(0.040)	(0.036)	(0.059)	(0.017)	(0.015)	(0.049)	(0.070)	(0.031)	(0.060)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var. (level)	1.29	16.4	1.22	1.68	-0.00	1.27	0.50	17.5	0.035
SD Dep. Var. (level)	3.74	37.7	3.97	4.59	0.35	3.74	1.52	48.9	0.048
Adjusted R^2	0.79	0.75	0.84	0.96	0.62	0.67	0.61	0.84	0.54
# Observations	40,539	40,539	25,826	24,930	24,930	40,382	34,318	34,318	34,318
# Fixed Effects	10,807	10,807	7,507	7,348	7,348	10,774	9,921	9,921	9,921
# Firms	5,754	5,754	3,866	3,771	3,771	5,742	5,395	5,395	5,395

Notes: Table D5 shows the results of running the event-study specification (1) for nine of our most important outcome variables. These results differ from those in Tables 1 and 2 in the sample of firms allowed in the control group. Namely, all columns correspond to a sample including only the first-time suppliers to MNCs and firms that are never-suppliers to MNCs but that supply to at least one big domestic firm sometime between 2008 and 2017. Put differently, this sample starts from the baseline sample from which we exclude firms that were *both* never-suppliers to an MNC *and* never-suppliers to a large domestic firm. We define large domestic firms as domestic firms whose median number of workers across all years of activity is larger than 100. The first three outcome variables are measures of firm size: log total sales (column (1)), log number of workers (column (2)) and log input costs (as a proxy for materials, column (3)). Columns (4) and (5) consider two measures of TFP. Column (4) uses a measure of TFP resulting from OLS production function estimation and assumes a Cobb–Douglas technology, with revenues (CPI-deflated to 2013 U.S. dollars) as the output measure and total net assets, number of workers, and input costs as input measures for K, L, and M respectively. Column (5) shows the results of production function estimation following Ackerberg et al. (2015). Columns (6) to (9) study the performance of firms in their business with other buyers. Column (6) studies the log sales to others (sales to all buyers *except* the first MNC buyer). Column (7) studies the log transactions to others (sales to all corporate buyers *except* the first MNC buyer). Column (8) studies the log number of other corporate buyers + 1 (number of corporate buyers tracked by the firm-to-firm transaction data, *except* the first MNC buyer, + 1). Finally, column (9) studies the log average sales to other corporate buyers (total sales to other corporate buyers, divided by the number of other corporate buyers, *except* the first MNC buyer, +1). Except for the number of workers and the number of buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.3 Robustness of Baseline Estimates to Excluding First-time Suppliers Hiring New Managers or Former Workers for an MNC or for a Supplier to an MNC

Table D6: Robustness of Baseline Estimates to Excluding First-time Suppliers Hiring New Managers or Former Workers for an MNC or a Supplier to an MNC

	Baseline (1)	No Δ Top 1 Event (2)	No Δ Top 2 Event (3)	No Δ Top 1 Event-1 (4)	No Δ Top 2 Event-1 (5)	No Occ Mng Event (6)	No Occ Mng Event-1 (7)	No MNC Emp Event (8)	No MNC Emp Event-1 (9)	No Supp Emp Event (10)	No Supp Emp Event-1 (11)
4 years before event	0.016	0.019	0.016	0.016	0.015	0.014	0.016	0.013	0.019	0.008	0.023
	(0.014)	(0.016)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)	(0.019)	(0.023)	(0.017)	(0.018)
3 years before event	0.020**	0.020**	0.015	0.018*	0.021**	0.018	0.027**	0.016	0.012	0.023**	0.023*
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.015)	(0.011)	(0.012)
2 years before event	0.015	0.016	0.009	0.016	0.018*	0.016	0.020**	0.033***	0.021*	0.024**	0.016
	(0.010)	(0.010)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.010)	(0.011)
Year of event	0.059***	0.054***	0.050***	0.056***	0.054***	0.063***	0.062***	0.070***	0.049***	0.058***	0.055***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.011)	(0.012)	(0.009)	(0.010)
1 year after event	0.082***	0.080***	0.079***	0.080***	0.074***	0.083***	0.085***	0.079***	0.069***	0.079***	0.080***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.015)	(0.015)	(0.013)	(0.019)	(0.012)	(0.015)
2 years after event	0.088***	0.085***	0.081***	0.085***	0.083***	0.089***	0.093***	0.091***	0.079***	0.090***	0.088***
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.014)	(0.015)	(0.011)	(0.012)
3 years after event	0.088***	0.084***	0.086***	0.084***	0.083***	0.088***	0.093***	0.093***	0.078***	0.089***	0.089***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.018)	(0.016)	(0.014)	(0.014)
4 years after event	0.086***	0.085***	0.084***	0.085***	0.080***	0.087***	0.091***	0.089***	0.076***	0.089***	0.088***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.018)	(0.021)	(0.014)	(0.016)
Adjusted R^2	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.95	0.95
# Observations	64,419	63,338	62,649	63,619	63,191	63,484	63,798	58,723	59,759	61,911	63,171
# Fixed Effects	15,464	15,202	15,035	15,283	15,223	15,257	15,329	14,196	14,504	14,900	15,220
# Firms	10,492	10,292	10,165	10,371	10,297	10,357	10,412	9,621	9,851	10,072	10,309

Notes: Table D6 explores the robustness of the baseline estimates to excluding first-time suppliers having hired workers that could bring about both a first linkage to an MNC and improvements in firm performance. We focus on the TFP residual from an OLS regression that assumes a Cobb–Douglas technology. Column (1) reports our baseline estimates. Columns (2) to (5) exclude first-time suppliers having hired new managers either in the event year ("Event") or in the year before the event ("Event-1"). We identify managers as the top earners. Columns (2) and (4) exclude first-time suppliers having hired a new worker who became the top earner in the firm, whereas columns (3) and (5) also exclude first-time suppliers having hired a new worker who became the top two earner in the firm. Columns (6) and (7) identify managers based on their occupation code (major category 1 in the ISCO-08 classification). We only drop firms whose new managers are *new* hires. Columns (8) and (9) exclude first-time suppliers having hired a new worker whose main employer in the previous year was one of the 622 MNC affiliates in CR (irrespective of the occupation that this new worker holds at the new firm). Columns (10) and (11) exclude first-time suppliers having hired a new worker whose main employer in the previous year had supplied to any of the 622 MNCs at any time before the year when the employee moved to the first-time supplier. All columns correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers). ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.4 Robustness of Baseline Estimates to Different Sample Selection Criteria

Table D7: Robustness of Baseline Estimates to Sample Restrictions: No Size Restrictions for Domestic Firms; No Sector Restrictions for Domestic Firms

	No size restrictions for domestic firms						No sector restrictions for domestic firms					
	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.01	-0.04*	0.03	0.02	-0.04	0.05	0.05*	-0.01	0.02	-0.02	-0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.07)	(0.03)	(0.05)	(0.03)	(0.02)	(0.02)	(0.08)	(0.03)	(0.06)
3 years before event	0.02	-0.02	0.02	0.02	-0.01	0.03	0.03	-0.01	0.02*	0.00	0.01	-0.01
	(0.02)	(0.02)	(0.01)	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)	(0.04)	(0.02)	(0.04)
2 years before event	0.03	-0.00	0.02	-0.01	-0.00	-0.01	0.02	-0.01	0.02**	0.02	0.01	0.01
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)
Year of event	0.18***	0.05***	0.07***	-0.98***	0.02	-1.00***	0.16***	0.05**	0.06***	-0.87***	0.02	-0.89***
	(0.02)	(0.02)	(0.01)	(0.09)	(0.01)	(0.08)	(0.02)	(0.02)	(0.01)	(0.10)	(0.02)	(0.09)
1 year after event	0.30***	0.19***	0.09***	-0.02	0.19***	-0.21***	0.31***	0.22***	0.08***	0.12**	0.21***	-0.09**
	(0.02)	(0.02)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.01)	(0.05)	(0.02)	(0.04)
2 years after event	0.31***	0.22***	0.09***	0.20***	0.24***	-0.03	0.33***	0.24***	0.08***	0.27***	0.26***	0.01
	(0.03)	(0.02)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.02)	(0.06)	(0.02)	(0.05)
3 years after event	0.30***	0.22***	0.08***	0.35***	0.26***	0.09	0.32***	0.24***	0.08***	0.42***	0.28***	0.14***
	(0.03)	(0.02)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.02)	(0.06)	(0.02)	(0.05)
4 years after event	0.30***	0.22***	0.08***	0.43***	0.28***	0.15**	0.32***	0.23***	0.08***	0.43***	0.29***	0.14***
	(0.03)	(0.02)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.02)	(0.06)	(0.03)	(0.05)
Mean Dep. Var. (level)	0.49	7.76	0.74	0.25	9.17	0.031	0.90	16.9	1.19	0.37	13.0	0.041
SD Dep. Var. (level)	1.81	22.8	2.48	0.92	29.5	0.048	2.76	117.3	3.43	1.08	49.2	0.059
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.84	0.80	0.95	0.64	0.84	0.58	0.76	0.75	0.95	0.62	0.83	0.57
# Observations	244,488	244,488	111,812	112,870	112,870	112,870	136,011	136,011	68,012	72,229	72,229	72,229
# Fixed Effects	53,229	53,229	27,378	29,537	29,537	29,537	29,466	29,466	16,670	19,142	19,142	19,142
# Firms	44,223	44,223	21,022	22,288	22,288	22,288	21,310	21,310	11,271	12,695	12,695	12,695

Notes: Table D7 shows the results of running the event-study specification (1) for six of our most important outcome variables. The main difference between the two samples in this table and the baseline sample described in Section 2.2 and used in Tables 1 and 2 comes from the restrictions used in the sample creation. The sample in columns (1) to (6) relaxes the size restrictions for domestic firms used in the baseline sample (while still keeping in place the sector restrictions for domestic firms and the 100-worker restriction on the size of MNCs triggering the first-time supplying events). The sample in columns (7) to (12) relaxes the sector restrictions for domestic firms used in the baseline sample (while still keeping in place the size restrictions for domestic firms and the 100-worker restriction on the size of MNCs triggering the first-time supplying events). All columns correspond to the full sample including both first-time suppliers and never-suppliers. Except for the number of workers and the number of other buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D8: Robustness of Baseline Estimates to Sample Restrictions: No Size and Sector Restrictions for Domestic Firms; + All "MNCs"

	No size and sector restrictions for domestic firms						No size and sector restrictions for domestic firms, all "MNCs"					
	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.02	-0.04**	0.03*	-0.00	-0.03	0.03	0.04*	-0.03**	0.03*	0.02	-0.04*	0.06
	(0.02)	(0.02)	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)
3 years before event	0.03	-0.02	0.02	0.02	-0.00	0.02	0.04**	-0.01	0.02	0.09**	0.01	0.08**
	(0.02)	(0.01)	(0.01)	(0.04)	(0.01)	(0.04)	(0.02)	(0.01)	(0.01)	(0.04)	(0.01)	(0.04)
2 years before event	0.02	-0.02	0.02**	-0.00	-0.00	0.00	0.02*	-0.01	0.02**	0.01	-0.01	0.02
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)
Year of event	0.18***	0.04***	0.07***	-1.09***	0.01	-1.10***	0.18***	0.05***	0.07***	-1.32***	-0.01	-1.31***
	(0.02)	(0.02)	(0.01)	(0.09)	(0.01)	(0.08)	(0.02)	(0.02)	(0.01)	(0.09)	(0.01)	(0.09)
1 year after event	0.29***	0.18***	0.08***	-0.04	0.17***	-0.22***	0.30***	0.18***	0.08***	-0.08	0.18***	-0.26***
	(0.02)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.02)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)
2 years after event	0.29***	0.20***	0.08***	0.19***	0.22***	-0.04	0.31***	0.20***	0.08***	0.20***	0.24***	-0.05
	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.02)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)
3 years after event	0.29***	0.20***	0.07***	0.32***	0.25***	0.08	0.30***	0.20***	0.08***	0.35***	0.26***	0.09*
	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)
4 years after event	0.29***	0.20***	0.07***	0.43***	0.27***	0.15***	0.29***	0.20***	0.08***	0.45***	0.29***	0.16***
	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)
Mean Dep. Var. (level)	0.51	9.59	0.79	0.25	9.23	0.032	0.49	9.35	0.75	0.24	8.88	0.032
SD Dep. Var. (level)	1.98	81.6	2.70	0.84	37.3	0.050	1.89	82.4	2.56	0.83	37.3	0.050
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.84	0.81	0.95	0.63	0.83	0.58	0.84	0.81	0.95	0.61	0.82	0.57
# Observations	283,436	283,436	117,309	130,096	130,096	130,096	275,568	275,568	113,200	122,916	122,916	122,916
# Fixed Effects	62,255	62,255	29,310	34,069	34,069	34,069	61,005	61,005	28,537	32,759	32,759	32,759
# Firms	51,975	51,975	22,409	25,996	25,996	25,996	50,807	50,807	21,757	24,837	24,837	24,837

Notes: Table D8 shows the results of running the event-study specification (1) for six of our most important outcome variables. The main difference between the samples in this table and the baseline sample described in Section 2.2 and used in Tables 1 and 2 comes from the restrictions used in the sample creation. The sample in columns (1) to (6) relaxes at the same time the size and sectoral restrictions for domestic firms used in the baseline sample (while still keeping in place the 100-worker restriction on the size of MNCs triggering the first-time supplying events). In addition to relaxing the size and sectoral restrictions for the domestic firms used in the baseline sample, the sample in columns (7) to (12) allows the first-time supplying events to be triggered by any "MNC" (irrespective of its employment in CR). We use the quotation marks for "MNCs" because not all of these smaller "MNCs" are MNC affiliates in the strict sense of being part of an enterprise that manages production establishments/plants located in at least two countries (as defined in Antràs and Yeaple, 2014). Those that are not "MNCs" in the strict sense are single-location firms with at least partial foreign ownership. All columns correspond to the full sample including both first-time suppliers and never-suppliers. Except for the number of workers and the number of other buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D9: Robustness of Baseline Estimates to Sample Restrictions: All "MNCs"; All "MNCs" over 25 Median Number of Workers

	All "MNCs"						All "MNCs" over 25 median number of workers					
	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.06**	0.01	0.03	-0.01	-0.05*	0.03	0.07**	0.02	0.02	0.02	-0.03	0.05
	(0.03)	(0.02)	(0.02)	(0.07)	(0.03)	(0.05)	(0.03)	(0.02)	(0.01)	(0.07)	(0.03)	(0.05)
3 years before event	0.04**	0.01	0.02*	-0.00	-0.01	0.00	0.04**	0.01	0.02	-0.02	-0.01	-0.01
	(0.02)	(0.01)	(0.01)	(0.05)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)	(0.05)	(0.02)	(0.04)
2 years before event	0.03	-0.00	0.02	0.02	-0.01	0.03	0.02	-0.01	0.02	0.01	-0.00	0.01
	(0.02)	(0.01)	(0.01)	(0.04)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)
Year of event	0.15***	0.06***	0.06***	-0.89***	0.02	-0.91***	0.15***	0.06***	0.06***	-0.86***	0.02	-0.88***
	(0.02)	(0.02)	(0.01)	(0.10)	(0.02)	(0.09)	(0.02)	(0.02)	(0.01)	(0.10)	(0.02)	(0.09)
1 year after event	0.32***	0.24***	0.08***	0.14**	0.23***	-0.10*	0.32***	0.24***	0.08***	0.13**	0.22***	-0.09*
	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.03)	(0.03)	(0.01)	(0.06)	(0.02)	(0.05)
2 years after event	0.36***	0.27***	0.08***	0.32***	0.29***	0.02	0.35***	0.27***	0.08***	0.33***	0.28***	0.05
	(0.03)	(0.03)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.01)	(0.08)	(0.02)	(0.06)
3 years after event	0.35***	0.27***	0.09***	0.54***	0.32***	0.22***	0.34***	0.26***	0.09***	0.51***	0.31***	0.20***
	(0.03)	(0.03)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.03)	(0.01)	(0.08)	(0.03)	(0.06)
4 years after event	0.32***	0.25***	0.08***	0.51***	0.32***	0.19***	0.32***	0.25***	0.09***	0.49***	0.31***	0.18***
	(0.03)	(0.03)	(0.01)	(0.08)	(0.03)	(0.07)	(0.03)	(0.03)	(0.02)	(0.07)	(0.03)	(0.06)
Mean Dep. Var. (level)	0.82	12.9	1.07	0.36	12.4	0.038	0.83	13.0	1.07	0.36	12.5	0.038
SD Dep. Var. (level)	2.38	32.1	2.94	1.06	38.1	0.057	2.37	32.2	2.92	1.06	38.2	0.056
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.76	0.73	0.95	0.61	0.84	0.55	0.76	0.73	0.95	0.62	0.84	0.56
# Observations	112,127	112,127	61,715	58,799	58,799	58,799	113,505	113,505	62,582	60,055	60,055	60,055
# Fixed Effects	24,468	24,468	14,976	15,898	15,898	15,898	24,673	24,673	15,117	16,113	16,113	16,113
# Firms	17,438	17,438	10,104	10,292	10,292	10,292	17,612	17,612	10,222	10,462	10,462	10,462

Notes: Table D9 shows the results of running the event-study specification (1) for six of our most important outcome variables. The main difference between the two samples in this table and the baseline sample described in Section 2.2 and used in Tables 1 and 2 comes from the restrictions used in the sample creation. The sample in columns (1) to (6) includes first-time supplying events triggered by all "MNCs" (irrespective of their employment in CR). The sample in columns (7) to (12) requires all "MNCs" triggering first-time supplying events to employ a median of at least 25 workers across all years of activity in CR. We use the quotation marks for "MNCs" because not all of these smaller "MNCs" are MNC affiliates in the strict sense of being part of an enterprise that manages production establishments/plants located in at least two countries (as defined in Antràs and Yeaple, 2014). Those that are not "MNCs" in the strict sense are single-location firms with at least partial foreign ownership. Both samples maintain the same size and sector restrictions for domestic firms as the baseline sample described in Section 2.2 and used in Tables 1 and 2. All columns correspond to the full sample including both first-time suppliers and never-suppliers. Except for the number of workers and the number of other buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D10: Robustness of Baseline Estimates to Sample Restrictions: All "MNCs" over 50 or 75 Median Number of Workers

	All "MNCs" over 50 median number of workers						All "MNCs" over 75 median number of workers					
	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers	Total Sales	Number Workers	TFP CD OLS	Corp. Sales Others	Number Other Buyers	Av. Sales Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4 years before event	0.07***	0.03	0.02	0.04	-0.02	0.06	0.07***	0.03	0.02	0.04	-0.01	0.05
	(0.03)	(0.02)	(0.02)	(0.07)	(0.03)	(0.05)	(0.03)	(0.02)	(0.02)	(0.07)	(0.03)	(0.06)
3 years before event	0.03*	0.01	0.02*	-0.01	-0.01	0.00	0.04*	0.01	0.02**	-0.01	-0.00	-0.01
	(0.02)	(0.01)	(0.01)	(0.05)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)	(0.05)	(0.02)	(0.04)
2 years before event	0.02	-0.00	0.02*	0.02	-0.00	0.02	0.02	-0.00	0.02*	0.02	0.00	0.01
	(0.02)	(0.02)	(0.01)	(0.04)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)
Year of event	0.15***	0.06***	0.06***	-0.83***	0.02	-0.85***	0.16***	0.07***	0.06***	-0.79***	0.02*	-0.82***
	(0.02)	(0.02)	(0.01)	(0.10)	(0.02)	(0.09)	(0.02)	(0.02)	(0.01)	(0.10)	(0.01)	(0.09)
1 year after event	0.32***	0.24***	0.08***	0.14**	0.22***	-0.08*	0.33***	0.24***	0.08***	0.15**	0.23***	-0.07
	(0.03)	(0.03)	(0.01)	(0.06)	(0.02)	(0.05)	(0.03)	(0.03)	(0.01)	(0.06)	(0.02)	(0.05)
2 years after event	0.35***	0.26***	0.09***	0.31***	0.28***	0.03	0.36***	0.27***	0.09***	0.32***	0.29***	0.04
	(0.03)	(0.03)	(0.01)	(0.07)	(0.02)	(0.06)	(0.03)	(0.04)	(0.01)	(0.07)	(0.02)	(0.06)
3 years after event	0.34***	0.26***	0.10***	0.48***	0.31***	0.17***	0.35***	0.27***	0.10***	0.49***	0.31***	0.18***
	(0.03)	(0.03)	(0.02)	(0.07)	(0.02)	(0.06)	(0.04)	(0.04)	(0.02)	(0.06)	(0.02)	(0.05)
4 years after event	0.32***	0.24***	0.09***	0.43***	0.31***	0.12**	0.33***	0.25***	0.09***	0.45***	0.31***	0.14**
	(0.03)	(0.03)	(0.02)	(0.07)	(0.03)	(0.06)	(0.04)	(0.04)	(0.02)	(0.06)	(0.03)	(0.05)
Mean Dep. Var. (level)	0.84	13.1	1.10	0.37	12.7	0.038	0.85	13.2	1.12	0.37	12.8	0.039
SD Dep. Var. (level)	2.41	32.6	2.97	1.07	38.6	0.056	2.54	32.6	3.17	1.21	38.8	0.056
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.77	0.74	0.95	0.63	0.84	0.56	0.77	0.74	0.95	0.63	0.84	0.56
# Observations	114,963	114,963	63,300	61,409	61,409	61,409	115,624	115,624	63,754	62,007	62,007	62,007
# Fixed Effects	24,915	24,915	15,249	16,366	16,366	16,366	25,026	25,026	15,340	16,474	16,474	16,474
# Firms	17,809	17,809	10,329	10,655	10,655	10,655	17,909	17,909	10,403	10,754	10,754	10,754

Notes: Table D10 shows the results of running the event-study specification (1) for six of our most important outcome variables. The main difference between the two samples in this table and the baseline sample described in Section 2.2 and used in Tables 1 and 2 comes from the restrictions used in the sample creation. The sample in columns (1) to (6) requires all "MNCs" triggering first-time supplying events to employ a median of at least 50 workers across all years of activity in CR. The sample in columns (7) to (12) requires all "MNCs" triggering first-time supplying events to employ a median of at least 75 workers across all years of activity in CR. We use the quotation marks for "MNCs" because not all of these smaller "MNCs" are MNC affiliates in the strict sense of being part of an enterprise that manages production establishments/plants located in at least two countries (as defined in Antràs and Yeaple, 2014). Those that are not "MNCs" in the strict sense are single-location firms with at least partial foreign ownership. Both samples maintain the same size and sector restrictions for domestic firms as the baseline sample described in Section 2.2 and used in Tables 1 and 2. All columns correspond to the full sample including both first-time suppliers and never-suppliers. Except for the number of workers and the number of other buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.5 Robustness of Baseline Estimates to Different Sets of Fixed Effects

Table D11: Robustness of Baseline TFP (CD OLS) Estimates to Different Sets of Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
4 years before event	0.059**	0.036**	0.027*	0.016	0.007	0.017	0.024	0.011	-0.012	-0.001
	(0.027)	(0.017)	(0.015)	(0.014)	(0.019)	(0.025)	(0.028)	(0.025)	(0.022)	(0.028)
3 years before event	0.056***	0.033***	0.025**	0.020**	0.008	0.030	0.018	0.008	-0.004	-0.001
	(0.021)	(0.012)	(0.011)	(0.010)	(0.014)	(0.024)	(0.019)	(0.017)	(0.015)	(0.018)
2 years before event	0.040**	0.018	0.013	0.015	0.021	0.023*	0.023*	0.013	0.010	0.005
	(0.017)	(0.011)	(0.011)	(0.010)	(0.014)	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)
Year of event	0.110***	0.053***	0.059***	0.059***	0.055***	0.089***	0.055***	0.060***	0.061***	0.059***
	(0.018)	(0.009)	(0.009)	(0.009)	(0.013)	(0.013)	(0.011)	(0.010)	(0.009)	(0.013)
1 year after event	0.119***	0.076***	0.082***	0.082***	0.079***	0.105***	0.084***	0.084***	0.090***	0.086***
	(0.018)	(0.012)	(0.014)	(0.014)	(0.016)	(0.016)	(0.017)	(0.015)	(0.013)	(0.016)
2 years after event	0.110***	0.078***	0.087***	0.088***	0.088***	0.099***	0.090***	0.093***	0.097***	0.087***
	(0.018)	(0.011)	(0.012)	(0.011)	(0.016)	(0.020)	(0.021)	(0.018)	(0.017)	(0.025)
3 years after event	0.110***	0.075***	0.088***	0.088***	0.089***	0.099***	0.087***	0.095***	0.101***	0.087***
	(0.018)	(0.013)	(0.014)	(0.014)	(0.020)	(0.024)	(0.026)	(0.023)	(0.021)	(0.030)
4 years after event	0.099***	0.070***	0.086***	0.086***	0.070***	0.086***	0.078**	0.087***	0.099***	0.073*
	(0.015)	(0.014)	(0.016)	(0.015)	(0.018)	(0.025)	(0.033)	(0.026)	(0.027)	(0.038)
Firm FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	No	No	No	Yes	Yes	No	No	No
Year-4DSect FE	No	No	Yes	No	No	No	No	Yes	No	No
Year-4DSect-Province FE	No	No	No	Yes	No	No	No	No	Yes	No
Year-4DSect-Municipality FE	No	No	No	No	Yes	No	No	No	No	Yes
Never Suppliers	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Mean Dep. Var. (level)	1.12	1.12	1.12	1.12	1.13	1.96	1.98	1.98	2.00	2.06
SD Dep. Var. (level)	3.17	3.17	3.17	3.17	3.09	5.61	5.65	5.65	5.74	5.64
Adjusted R^2	0.84	0.95	0.95	0.95	0.95	0.86	0.96	0.96	0.96	0.97
# Observations	64,419	64,419	64,419	64,419	53,080	14,645	14,435	14,253	13,706	8,472
# Fixed Effects	10	10,502	12,079	15,464	18,983	10	2,254	3,350	4,774	3,936
# Firms	10,492	10,492	10,492	10,492	8,807	2,454	2,244	2,221	2,144	1,384

Notes: Table D11 shows the results of running five variants of the event-study specification (1) for one dependent variable: log TFP from an OLS production function estimation that assumes a Cobb–Douglas technology. The event is still defined as a first time sale to an MNC. Reported are the coefficients for event-time -4 to $+4$, where the coefficients for the year prior to the event are normalized to zero. Columns (1) to (5) correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers). Columns (6) to (10) correspond to the restricted economy-wide sample including only first-time suppliers to MNCs. The only difference between columns (1) to (5) and between columns (6) to (10) comes from the combination of fixed effects used in each column. Columns (4) and (9) use our preferred combination of fixed effects. The estimates from the same regressions with different outcome variables paint a very similar picture and are available upon request. Means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). In columns (1) to (5) the clustering of standard errors is at the two-digit sector by province level. In columns (6) to (10) the clustering of standard errors is at event-by-province level. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.6 Robustness of Baseline Estimates to Balancing the Sample in Event Time

In Table D12, we replicate the baseline economy-wide event-study analysis on a version of the restricted sample balanced in event time from *-1* to *+1*. This new sample allows us to rule out compositional confounds around the event year. However, it also carries the obvious drawbacks of omitting young firms and of imposing survival after the event. Adding this requirement of balancing delivers qualitatively similar results.

Table D12: Robustness of Baseline Estimates to Using a Balanced Sample in Event Time

	TFP CD OLS	TFP TL OLS	Total Sales	Number Workers	Net Assets	Value Added	Sales to Others	Total Corp Sales	Corp. Sales to Others	Number Other Buyers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
4 years before event	0.01	0.03	0.05	0.00	-0.08	-0.02	-0.01	0.04	0.03	0.01
	(0.03)	(0.03)	(0.07)	(0.06)	(0.10)	(0.08)	(0.10)	(0.11)	(0.18)	(0.06)
3 years before event	0.01	0.03	0.05	0.01	-0.05	-0.02	-0.02	0.04	0.03	0.02
	(0.02)	(0.02)	(0.05)	(0.04)	(0.07)	(0.06)	(0.07)	(0.06)	(0.12)	(0.04)
2 years before event	0.02	0.01	0.03	0.01	-0.00	0.00	-0.03	0.04	0.06	0.03
	(0.01)	(0.01)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.07)	(0.02)
Year of event	0.05***	0.03***	0.29***	0.24***	0.20***	0.21***	0.05	0.38***	-0.42***	0.10***
	(0.01)	(0.01)	(0.03)	(0.02)	(0.04)	(0.03)	(0.05)	(0.04)	(0.14)	(0.03)
1 year after event	0.07***	0.04**	0.30***	0.24***	0.21***	0.22***	0.14*	0.40***	0.18	0.18***
	(0.02)	(0.02)	(0.05)	(0.04)	(0.06)	(0.04)	(0.08)	(0.07)	(0.14)	(0.04)
2 years after event	0.07**	0.04*	0.29***	0.23***	0.28***	0.24***	0.18*	0.39***	0.31*	0.20***
	(0.03)	(0.02)	(0.07)	(0.05)	(0.07)	(0.06)	(0.10)	(0.10)	(0.18)	(0.06)
3 years after event	0.08**	0.04	0.24***	0.21***	0.30***	0.25***	0.16	0.39***	0.45**	0.20***
	(0.04)	(0.03)	(0.09)	(0.07)	(0.10)	(0.08)	(0.12)	(0.12)	(0.23)	(0.07)
4 years after event	0.07	0.03	0.22**	0.16*	0.31**	0.23**	0.18	0.36**	0.41	0.19**
	(0.05)	(0.04)	(0.11)	(0.09)	(0.12)	(0.09)	(0.14)	(0.15)	(0.28)	(0.09)
Mean Dep. Var. (level)	2.20	2.20	1.64	21.7	1.07	0.25	1.61	0.62	0.60	20.1
SD Dep. Var. (level)	5.99	5.99	4.84	50.4	3.27	0.66	4.85	1.92	1.93	55.0
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.97	0.98	0.81	0.80	0.82	0.74	0.67	0.75	0.57	0.84
# Observations	10,295	10,295	17,203	17,203	15,714	16,583	17,149	14,753	14,417	14,417
# Fixed Effects	3,655	3,655	5,437	5,437	5,237	5,360	5,425	5,035	4,946	4,946
# Firms	1,416	1,416	2,145	2,145	2,056	2,137	2,143	2,080	2,043	2,043

Notes: Table D12 shows the results of running the event-study specification (1) adapted to ten dependent variables. All columns correspond to a balanced version of the restricted economy-wide sample (including only first-time suppliers to MNCs), where the imposed balancing is between event years *-1* and *+1*. The event is still defined as a first time sale to an MNC. Reported are the coefficients for event-time -4 to $+4$, where the coefficients for the year prior to the event are normalized to zero. Except for the number of workers and the number of buyers, means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix E More Evidence to Guide Interpretation

Online Appendix E.1 Differences in the Importance of Backward Linkages By Level of Disaggregation

Table E1: TFP Gains from FDI Estimated à la Blalock and Gertler (2008)

	Sector-to-sector (1)	Firm-to-firm (2)
Backward	-0.041	0.027***
	(0.043)	(0.007)
Horizontal	-0.110***	-0.106***
	(0.040)	(0.037)
Forward	0.006	-0.002
	(0.013)	(0.007)
Firm FE	Yes	Yes
Year-Prov FE	Yes	Yes
Adjusted R^2	0.97	0.97
# Observations	99,537	99,537
# Fixed Effects	14,924	14,924
# Firms	14,854	14,854

Notes: Table E1 reports the results from an adapted version of equation (1) from Blalock and Gertler (2008). Our specification is closest to that used in Column (3), Table 6 in their paper. As Blalock and Gertler (2008), we estimate a translog (TL) production function with labor, capital, and materials. In contrast to Blalock and Gertler (2008), our production function does not use energy, as we do not have firm-level data on energy consumption. Also in contrast to Blalock and Gertler (2008), we include an additional variable measuring forward linkages, which we constructed as in Javorcik (2004). In contrast to Blalock and Gertler (2008), we include year×province and firm fixed effects (as opposed to year×province, sector×year and firm fixed effects). While Blalock and Gertler (2008) calculate the Horizontal variable at the sector×year×province level, we calculate this variable at the sector×year level. Hence, we do not control for sector×year fixed effects, as this would absorb all the variation in our Horizontal variable. Column (1) uses the sector-to-sector measures of Backward and Forward linkages. Column (2) uses the firm-to-firm measures of Backward and Forward linkages. We have built both the sector-to-sector and firm-to-firm measures using the firm-to-firm transaction data. As a reference, Blalock and Gertler (2008) estimate the coefficients on Backward and Horizontal as 0.090 (SE 4.40) and 0.009 (SE 0.88), respectively, for the case of Indonesia.

Online Appendix E.2 Placebo Demand Shocks

Table E2: Descriptive Statistics of the Buyers of First-Time Suppliers to an MNC vs. the Government

	First MNC Buyers (1)	First Gov Buyers (2)	Diff. (1)-(2)
Agriculture, forestry and fishing	0.0586	0	0.0586
	(0.24)	(0.00)	(0.04)
Manufacturing	0.381	0	0.381***
	(0.49)	(0.00)	(0.07)
Electricity and gas	0	0.0465	-0.0465***
	(0.00)	(0.21)	(0.01)
Water supply, sewerage and waste management	0.00450	0.0233	-0.0188
	(0.07)	(0.15)	(0.01)
Construction	0.0113	0	0.0113
	(0.11)	(0.00)	(0.02)
Wholesale and retail trade	0.140	0.0233	0.116*
	(0.35)	(0.15)	(0.05)
Transportation and storage	0.0428	0.0698	-0.0270
	(0.20)	(0.26)	(0.03)
Accommodation and food services	0.0586	0	0.0586
	(0.24)	(0.00)	(0.04)
Information and communication	0.0676	0.0465	0.0211
	(0.25)	(0.21)	(0.04)
Real estate	0.0405	0	0.0405
	(0.20)	(0.00)	(0.03)
Professional, scientific and technical	0.0586	0.0233	0.0353
	(0.24)	(0.15)	(0.04)
Administrative and support services	0.117	0	0.117*
	(0.32)	(0.00)	(0.05)
Education	0.00901	0	0.00901
	(0.09)	(0.00)	(0.01)
Human health and social work	0.00225	0	0.00225
	(0.05)	(0.00)	(0.01)
Art, entertainment and recreation	0.00450	0.0930	-0.0885***
	(0.07)	(0.29)	(0.02)
Other services	0.00225	0.0698	-0.0675***
	(0.05)	(0.26)	(0.01)
Mining and quarrying	0.00225	0	0.00225
	(0.05)	(0.00)	(0.01)
Public administration	0	0.605	-0.605***
	(0.00)	(0.49)	(0.02)
Located in San Jose province	0.423	0.744	-0.321***
	(0.49)	(0.44)	(0.08)
Total sales (thous. U.S. dollars)	56,283.3	160,106.3	-103,823.0**
	(116,338.72)	(627,382.13)	(34,421.01)
Number of workers	481.4	978.3	-496.8*
	(1009.46)	(3933.33)	(240.66)
Total sales (thous. U.S. dollars) / worker	147.8	131.0	16.78
	(228.94)	(245.60)	(36.80)
Number of suppliers	118.4	139.7	-21.27
	(137.38)	(329.90)	(26.08)
Average duration (years)	2.660	2.357	0.303***
	(0.50)	(0.62)	(0.08)
Share of imports	0.411	0.131	0.280***
	(0.33)	(0.25)	(0.05)
# Buyers	444	98	

Notes: Table E2 presents descriptive statistics for the buyers triggering first-time supplying events to either an MNC (column (1)) or the government (column (2)). The number of first MNC buyers is 444, while the number of first government buyers is 98. Column (3) reports the differences between the means in column (1) and (2), together with their statistical significance. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E3: Descriptive Statistics of the Buyers of First-Time Suppliers to an MNC vs. a Large Domestic Firm

	First MNC Buyers (1)	First Large Dom Buyers (2)	Diff. (1)-(2)
Agriculture, forestry and fishing	0.0586	0.131	-0.0728***
	(0.24)	(0.34)	(0.02)
Manufacturing	0.381	0.217	0.163***
	(0.49)	(0.41)	(0.03)
Water supply, sewerage and waste management	0.00450	0	0.00450
	(0.07)	(0.00)	(0.00)
Construction	0.0113	0	0.0113*
	(0.11)	(0.00)	(0.01)
Wholesale and retail trade	0.140	0.239	-0.0990***
	(0.35)	(0.43)	(0.03)
Transportation and Storage	0.0428	0.0992	-0.0564**
	(0.20)	(0.30)	(0.02)
Accommodation and food services	0.0586	0.0536	0.00494
	(0.24)	(0.23)	(0.02)
Information and communication	0.0676	0.0188	0.0488***
	(0.25)	(0.14)	(0.01)
Real estate	0.0405	0	0.0405***
	(0.20)	(0.00)	(0.01)
Professional, scientific and technical	0.0586	0.0670	-0.00847
	(0.24)	(0.25)	(0.02)
Administrative and support service	0.117	0.137	-0.0196
	(0.32)	(0.34)	(0.02)
Education	0.00901	0	0.00901
	(0.09)	(0.00)	(0.00)
Human health and social work	0.00225	0.00268	-0.000429
	(0.05)	(0.05)	(0.00)
Art, entertainment and recreation	0.00450	0.0214	-0.0169*
	(0.07)	(0.15)	(0.01)
Other services	0.00225	0.00804	-0.00579
	(0.05)	(0.09)	(0.00)
Mining and quarrying	0.00225	0.00536	-0.00311
	(0.05)	(0.07)	(0.00)
Located in San Jose province	0.423	0.544	-0.121***
	(0.49)	(0.50)	(0.03)
Total sales (thous. U.S. dollars)	56,283.3	20,296.8	35,986.5***
	(116,338.72)	(34,641.09)	(6,244.62)
Number of workers	481.4	275.4	206.0***
	(1,009.46)	(274.03)	(53.87)
Total sales (thous. U.S. dollars) / worker	147.8	81.42	66.33***
	(228.94)	(81.45)	(12.47)
Number of suppliers	118.4	91.21	27.23**
	(137.38)	(89.26)	(8.28)
Average duration (years)	2.660	2.845	-0.185***
	(0.50)	(0.58)	(0.04)
Share of imports	0.411	0.228	0.183***
	(0.33)	(0.28)	(0.02)
# Buyers	444	373	

Notes: Table E3 presents descriptive statistics for the buyers triggering first-time supplying events to either an MNC (column (1)) or a large domestic firm buyer (column (2)). The number of first MNC buyers is 444, while the number of first large domestic firm buyers is 373. Column (3) reports the differences between the means in column (1) and (2), together with their statistical significance. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E4: Descriptive Statistics of the Buyers of First-Time Suppliers to an MNC vs. a Domestic Exporter

	First MNC Buyers (1)	First Dom Exp Buyers (2)	Diff. (1)-(2)
Agriculture, forestry and fishing	0.0586	0.177	-0.118***
	(0.24)	(0.38)	(0.02)
Manufacturing	0.381	0.353	0.0274
	(0.49)	(0.48)	(0.03)
Water supply, sewerage and waste management	0.00450	0	0.00450
	(0.07)	(0.00)	(0.00)
Construction	0.0113	0	0.0113*
	(0.11)	(0.00)	(0.01)
Wholesale and retail trade	0.140	0.397	-0.258***
	(0.35)	(0.49)	(0.03)
Transportation and storage	0.0428	0.0208	0.0220
	(0.20)	(0.14)	(0.01)
Accommodation and food services	0.0586	0	0.0586***
	(0.24)	(0.00)	(0.01)
Information and communication	0.0676	0.0104	0.0572***
	(0.25)	(0.10)	(0.01)
Real estate	0.0405	0	0.0405***
	(0.20)	(0.00)	(0.01)
Professional, scientific and technical	0.0586	0.0156	0.0430**
	(0.24)	(0.12)	(0.01)
Administrative and support service	0.117	0.0130	0.104***
	(0.32)	(0.11)	(0.02)
Education	0.00901	0	0.00901
	(0.09)	(0.00)	(0.00)
Human health and social work	0.00225	0	0.00225
	(0.05)	(0.00)	(0.00)
Art, entertainment and recreation	0.00450	0	0.00450
	(0.07)	(0.00)	(0.00)
Other services	0.00225	0.00779	-0.00554
	(0.05)	(0.09)	(0.00)
Mining and quarrying	0.00225	0.00519	-0.00294
	(0.05)	(0.07)	(0.00)
Located in San Jose province	0.423	0.475	-0.0519
	(0.49)	(0.50)	(0.03)
Total sales (thous. U.S. dollars)	56,283.3	9,796.2	46,487.1***
	(116,338.72)	(24,422.70)	(6,041.84)
Number of workers	481.4	84.00	397.4***
	(1,009.46)	(136.23)	(51.86)
Total sales (thous. U.S. dollars) / worker	147.8	201.5	-53.78*
	(228.94)	(368.68)	(21.03)
Number of suppliers	118.4	48.41	70.03***
	(137.38)	(71.40)	(7.78)
Average duration (years)	2.660	2.707	-0.0465
	(0.50)	(0.64)	(0.04)
Share of imports	0.411	0.378	0.0326
	(0.33)	(0.33)	(0.02)
# Buyers	444	385	

Notes: Table E4 presents descriptive statistics for the buyers triggering first-time supplying events to either an MNC (column (1)) or a domestic exporter (column (2)). The number of first MNC buyers is 444, while the number of first domestic exporter buyers is 385. Column (3) reports the differences between the means in column (1) and (2), together with their statistical significance. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E5: Descriptive Statistics of First-Time Suppliers to an MNC vs. the Government

	Full sample comparison			Matching comparison		
	First-time MNC Suppliers	First-time Govern. Suppliers	Diff.	First-time MNC Suppliers	First-time Govern. Suppliers	Diff.
Sample	All	All		Matched	All	
	(1)	(2)	(1)-(2)	(4)	(5)	(4)-(5)
Characteristics first-time supplier						
Agriculture, forestry and fishing	0.0728	0.0449	0.0278***	0.0449	0.0449	0
	(0.26)	(0.21)	(0.01)	(0.21)	(0.21)	-
Manufacturing	0.112	0.125	-0.0134	0.125	0.125	0
	(0.32)	(0.33)	(0.01)	(0.33)	(0.33)	-
Wholesale and retail trade	0.318	0.432	-0.114***	0.432	0.432	0
	(0.47)	(0.50)	(0.01)	(0.50)	(0.50)	-
Transportation and storage	0.0928	0.0733	0.0195*	0.0733	0.0733	0
	(0.29)	(0.26)	(0.01)	(0.26)	(0.26)	-
Accommodation and food services	0.0636	0.0442	0.0193**	0.0442	0.0442	0
	(0.24)	(0.21)	(0.01)	(0.21)	(0.21)	-
Information and communication	0.0360	0.0359	0.0000387	0.0359	0.0359	0
	(0.19)	(0.19)	(0.01)	(0.19)	(0.19)	-
Professional, scientific and technical	0.144	0.135	0.00914	0.135	0.135	0
	(0.35)	(0.34)	(0.01)	(0.34)	(0.34)	-
Administrative and support services	0.0968	0.0781	0.0187*	0.0781	0.0781	0
	(0.30)	(0.27)	(0.01)	(0.27)	(0.27)	-
Human health and social work	0.0176	0.0104	0.00722	0.0104	0.0104	0
	(0.13)	(0.10)	(0.00)	(0.10)	(0.10)	-
Art, entertainment and recreation	0.0105	0.00484	0.00571	0.00484	0.00484	0
	(0.10)	(0.07)	(0.00)	(0.07)	(0.07)	-
Other services	0.0335	0.0124	0.0211***	0.0124	0.0124	0
	(0.18)	(0.11)	(0.01)	(0.11)	(0.11)	-
Mining and quarrying	0.00325	0.00415	-0.000901	0.00415	0.00415	0
	(0.06)	(0.06)	(0.00)	(0.06)	(0.06)	-
Located in San Jose province	0.454	0.489	-0.0349*	0.489	0.489	0
	(0.50)	(0.50)	(0.02)	(0.50)	(0.50)	-
Total sales (thous. U.S. dollars)	1,141.0	3,008.3	-1,867.3***	1,781.8	3,008.3	-1,226.6**
	(3,910.10)	(14,396.43)	(258.09)	(3,902.75)	(14,396.43)	(392.12)
# Workers	15.31	32.00	-16.68***	21.00	32.00	-11.00***
	(44.08)	(116.24)	(2.24)	(50.10)	(116.24)	(3.33)
Total sales (thous. U.S. dollars) / worker	110.5	138.6	-28.09**	121.8	138.6	-16.82
	(224.15)	(387.65)	(8.68)	(181.85)	(387.65)	(11.26)
# Buyers	12.56	27.01	-14.45***	20.93	27.01	-6.083*
	(33.13)	(86.56)	(1.67)	(41.57)	(86.56)	(2.52)
Characteristics first relationship						
Duration (years)	2.774	2.942	-0.168**	2.885	2.942	-0.0567
	(1.92)	(2.13)	(0.06)	(2.04)	(2.13)	(0.08)
First amount (thous. U.S. dollars)	62.37	60.06	2.314	51.78	60.06	-8.279*
	(110.25)	(114.49)	(3.46)	(98.48)	(114.49)	(3.97)
First amount as share of sales	0.170	0.119	0.0512***	0.120	0.119	0.00105
	(0.26)	(0.23)	(0.01)	(0.23)	(0.23)	(0.01)
# Events	3,697	1,447		1,447	1,447	
# Buyers	444	98		322	98	

Notes: Table E5 presents descriptive statistics for two samples of first-time suppliers to MNCs (columns (1) and (4)) and the full sample of 1,447 first-time suppliers to the government (columns (2) and (5)). We characterize the broad sector of first-time suppliers, their location, total sales, number of workers, total sales per worker, number of buyers, duration of their first relationship with the buyer, amount of their first transaction with the buyer, and importance of that transaction in their total sales. All monetary values are in the year of the event. Whenever there is more than one buyer that triggers the event, we present the share of sales sold to the largest of those buyers. Column (1) is for the full sample of 3,697 first-time suppliers to MNCs. Column (4) is for a subset of first-time suppliers to MNCs, namely those 1,447 firms that are the best match for the 1,447 first-time suppliers to the government. The matching is based on all the characteristics in this table and done in two steps. First, we restrict the candidates for matching in the sample of first-time suppliers to MNCs to be in the same sector and location as the firm (i.e., the first-time supplier to the government) to be matched. For each leftover variable, we compute a z-score. We then construct a loss function, defined as the equally-weighted sum (across all the leftover variables) of squares of differences between the z-score of the candidate match and that of the firm to be matched. The match for a given first-time supplier to the government is the first-time supplier to MNCs in the same sector and location with the smallest value of the loss function. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E6: Descriptive Statistics of First-Time Suppliers to an MNC vs. Large Domestic Firm

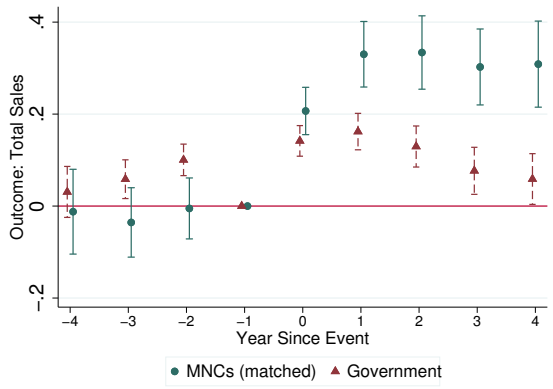
	Full sample comparison			Matching comparison		
	First-time MNC Suppliers	First-time Large Dom Suppliers	Diff.	First-time MNC Suppliers	First-time Large Dom Suppliers	Diff.
Sample	All	All		Matched	All	
	(1)	(2)	(1)-(2)	(4)	(5)	(4)-(5)
Characteristics first-time supplier						
Agriculture, forestry and fishing	0.0728	0.0931	-0.0203**	0.0931	0.0931	0
	(0.26)	(0.29)	(0.01)	(0.29)	(0.29)	-
Manufacturing	0.112	0.133	-0.0215*	0.133	0.133	0
	(0.32)	(0.34)	(0.01)	(0.34)	(0.34)	-
Wholesale and retail trade	0.318	0.368	-0.0508***	0.368	0.368	0
	(0.47)	(0.48)	(0.01)	(0.48)	(0.48)	-
Transportation and storage	0.0928	0.0741	0.0187*	0.0741	0.0741	0
	(0.29)	(0.26)	(0.01)	(0.26)	(0.26)	-
Accommodation and food services	0.0636	0.0514	0.0121	0.0514	0.0514	0
	(0.24)	(0.22)	(0.01)	(0.22)	(0.22)	-
Information and communication	0.0360	0.0293	0.00665	0.0293	0.0293	0
	(0.19)	(0.17)	(0.01)	(0.17)	(0.17)	-
Professional, scientific and technical	0.144	0.120	0.0240*	0.120	0.120	0
	(0.35)	(0.32)	(0.01)	(0.32)	(0.32)	-
Administrative and support services	0.0968	0.0854	0.0114	0.0854	0.0854	0
	(0.30)	(0.28)	(0.01)	(0.28)	(0.28)	-
Human health and social work	0.0176	0.0154	0.00215	0.0154	0.0154	0
	(0.13)	(0.12)	(0.00)	(0.12)	(0.12)	-
Art, entertainment and recreation	0.0105	0.00720	0.00335	0.00720	0.00720	0
	(0.10)	(0.08)	(0.00)	(0.08)	(0.08)	-
Other services	0.0335	0.0175	0.0161***	0.0175	0.0175	0
	(0.18)	(0.13)	(0.00)	(0.13)	(0.13)	-
Mining and quarrying	0.00325	0.00514	-0.00190	0.00514	0.00514	0
	(0.06)	(0.07)	(0.00)	(0.07)	(0.07)	-
Located in San Jose province	0.454	0.501	-0.0466***	0.501	0.501	0
	(0.50)	(0.50)	(0.01)	(0.50)	(0.50)	-
Total sales (thous. U.S. dollars)	1,141.0	1,120.0	20.98	912.4	1,120.0	-207.6**
	(3,910.10)	(2,710.08)	(99.26)	(1,686.87)	(2,710.08)	(72.40)
# Workers	15.31	13.26	2.052*	11.74	13.26	-1.523**
	(44.08)	(16.63)	(1.04)	(14.87)	(16.63)	(0.51)
Total sales (thous. U.S. dollars) / worker	110.5	103.2	7.297	94.77	103.2	-8.432
	(224.15)	(254.94)	(6.59)	(146.33)	(254.94)	(6.67)
# Buyers	12.56	12.18	0.385	11.11	12.18	-1.064
	(33.13)	(24.51)	(0.85)	(21.57)	(24.51)	(0.74)
Characteristics first relationship						
Duration (years)	2.774	2.574	0.200***	2.539	2.574	-0.0345
	(1.92)	(1.92)	(0.05)	(1.88)	(1.92)	(0.06)
First amount (thous. U.S. dollars)	62.37	44.25	18.12***	40.16	44.25	-4.091
	(110.25)	(93.59)	(2.94)	(82.51)	(93.59)	(2.83)
First amount as share of sales	0.170	0.116	0.0538***	0.112	0.116	-0.00466
	(0.26)	(0.25)	(0.01)	(0.21)	(0.25)	(0.01)
# Events	3,697	1,944		1,944	1,944	
# Buyers	444	373		341	373	

Notes: Table E6 presents descriptive statistics for two samples of first-time suppliers to MNCs (columns (1) and (4)) and the full sample of 1,944 first-time suppliers to a large domestic firm (columns (2) and (5)). We characterize the broad sector of first-time suppliers, their location, total sales, number of workers, total sales per worker, number of buyers, duration of their first relationship with the buyer, amount of their first transaction with the buyer, and importance of that transaction in their total sales. All monetary values are in the year of the event. Whenever there is more than one buyer that triggers the event, we present the share of sales sold to the largest of those buyers. Column (1) is for the full sample of 3,697 first-time suppliers to MNCs. Column (4) is for a subset of first-time suppliers to MNCs, namely those 1,944 firms that are the best match for the 1,944 first-time suppliers to a large domestic firm. The matching is based on all the characteristics in this table and done in two steps. First, we restrict the candidates for matching in the sample of first-time suppliers to MNCs to be in the same sector and location as the firm (i.e., the first-time supplier to a large domestic firm) to be matched. For each leftover variable, we compute a z-score. We then construct a loss function, defined as the equally-weighted sum (across all the leftover variables) of squares of differences between the z-score of the candidate match and that of the firm to be matched. The match for a given first-time supplier to a large domestic firm is the first-time supplier to MNCs in the same sector and location with the smallest value of the loss function. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

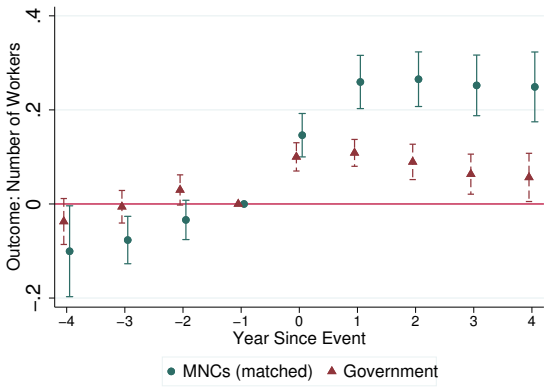
Table E7: Descriptive Statistics of First-Time Suppliers to an MNC vs. Domestic Exporter

	Full sample comparison			Matching comparison		
	First-time MNC Suppliers	First-time Dom Expor Suppliers	Diff.	First-time MNC Suppliers	First-time Dom Expor Suppliers	Diff.
Sample	All	All		Matched	All	
	(1)	(2)	(1)-(2)	(4)	(5)	(4)-(5)
Characteristics first-time supplier						
Agriculture, forestry and fishing	0.0728	0.108	-0.0355***	0.108	0.108	0
	(0.26)	(0.31)	(0.01)	(0.31)	(0.31)	-
Manufacturing	0.112	0.138	-0.0259*	0.138	0.138	0
	(0.32)	(0.34)	(0.01)	(0.34)	(0.34)	-
Wholesale and retail trade	0.318	0.351	-0.0330*	0.351	0.351	0
	(0.47)	(0.48)	(0.01)	(0.48)	(0.48)	-
Transportation and storage	0.0928	0.0670	0.0257**	0.0670	0.0670	0
	(0.29)	(0.25)	(0.01)	(0.25)	(0.25)	-
Accommodation and food services	0.0636	0.0391	0.0245***	0.0391	0.0391	0
	(0.24)	(0.19)	(0.01)	(0.19)	(0.19)	-
Information and communication	0.0360	0.0244	0.0115*	0.0244	0.0244	0
	(0.19)	(0.15)	(0.01)	(0.15)	(0.15)	-
Professional, scientific and technical	0.144	0.142	0.00144	0.142	0.142	0
	(0.35)	(0.35)	(0.01)	(0.35)	(0.35)	-
Administrative and support service	0.0968	0.0901	0.00675	0.0901	0.0901	0
	(0.30)	(0.29)	(0.01)	(0.29)	(0.29)	-
Human health and social work	0.0176	0.0133	0.00431	0.0133	0.0133	0
	(0.13)	(0.11)	(0.00)	(0.11)	(0.11)	-
Art, entertainment and recreation	0.0105	0.00838	0.00217	0.00838	0.00838	0
	(0.10)	(0.09)	(0.00)	(0.09)	(0.09)	-
Other services	0.0335	0.0154	0.0182***	0.0154	0.0154	0
	(0.18)	(0.12)	(0.01)	(0.12)	(0.12)	-
Mining and quarrying	0.00325	0.00349	-0.000246	0.00349	0.00349	0
	(0.06)	(0.06)	(0.00)	(0.06)	(0.06)	-
Located in San Jose province	0.454	0.489	-0.0344*	0.489	0.489	0
	(0.50)	(0.50)	(0.02)	(0.50)	(0.50)	-
Total sales (thous. U.S. dollars)	1,141.0	1,779.0	-638.0***	1,343.3	1,779.0	-435.7**
	(3,910.10)	(4,383.61)	(125.99)	(3,313.84)	(4,383.61)	(145.22)
# Workers	15.31	25.72	-10.40***	21.34	25.72	-4.376
	(44.08)	(71.70)	(1.66)	(58.64)	(71.70)	(2.45)
Total sales (thous. U.S. dollars) / worker	110.5	100.3	10.15	95.52	100.3	-4.824
	(224.15)	(125.90)	(6.28)	(121.23)	(125.90)	(4.62)
# Buyers	12.56	19.66	-7.094***	16.95	19.66	-2.703
	(33.13)	(40.88)	(1.10)	(32.82)	(40.88)	(1.39)
Characteristics first relationship						
Duration (years)	2.774	2.325	0.449***	2.293	2.325	-0.0321
	(1.92)	(1.76)	(0.06)	(1.72)	(1.76)	(0.07)
First amount (thous. U.S. dollars)	62.37	39.50	22.87***	38.53	39.50	-0.968
	(110.25)	(95.05)	(3.31)	(92.06)	(95.05)	(3.50)
First amount as share of sales	0.170	0.0894	0.0809***	0.0918	0.0894	0.00240
	(0.26)	(0.20)	(0.01)	(0.20)	(0.20)	(0.01)
# Events	3,697	1,432		1,432	1,432	
# Buyers	444	385		323	385	

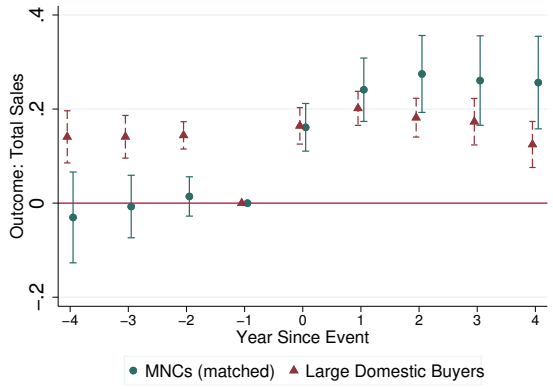
Notes: Table E7 presents descriptive statistics for two samples of first-time suppliers to MNCs (columns (1) and (4)) and the full sample of 1,432 first-time suppliers to a domestic exporter (columns (2) and (5)). We characterize the broad sector of first-time suppliers, their location, total sales, number of workers, total sales per worker, number of buyers, duration of their first relationship with the buyer, amount of their first transaction with the buyer, and importance of that transaction in their total sales. All monetary values are in the year of the event. Whenever there is more than one buyer that triggers the event, we present the share of sales sold to the largest of those buyers. Column (1) is for the full sample of 3,697 first-time suppliers to MNCs. Column (4) is for a subset of first-time suppliers to MNCs, namely those 1,432 firms that are the best match for the 1,432 first-time suppliers to a domestic exporter. The matching is based on all the characteristics in this table and done in two steps. First, we restrict the candidates for matching in the sample of first-time suppliers to MNCs to be in the same sector and location as the firm (i.e., the first-time supplier to a domestic exporter) to be matched. For each leftover variable, we compute a z-score. We then construct a loss function, defined as the equally-weighted sum (across all the leftover variables) of squares of differences between the z-score of the candidate match and that of the firm to be matched. The match for a given first-time supplier to a domestic exporter is the first-time supplier to MNCs in the same sector and location with the smallest value of the loss function. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.



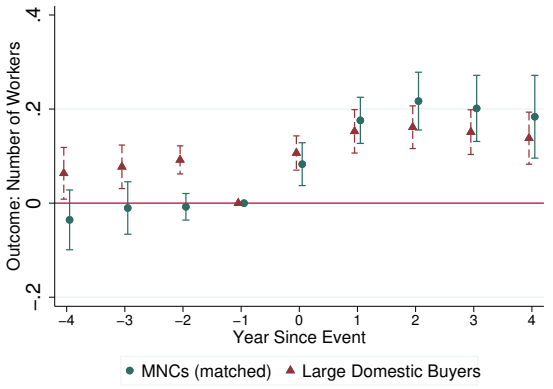
(a) Total Sales, Government



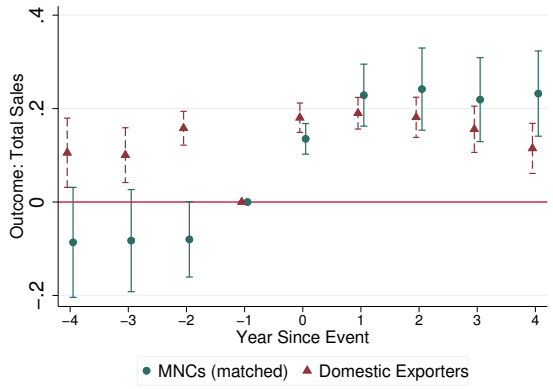
(b) Number of Workers, Government



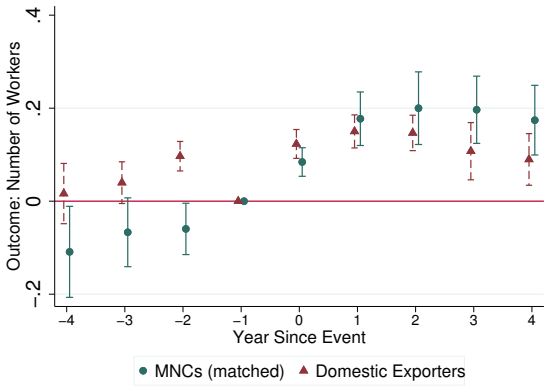
(c) Total Sales, Large Domestic Firm



(d) Number of Workers, Large Domestic Firm



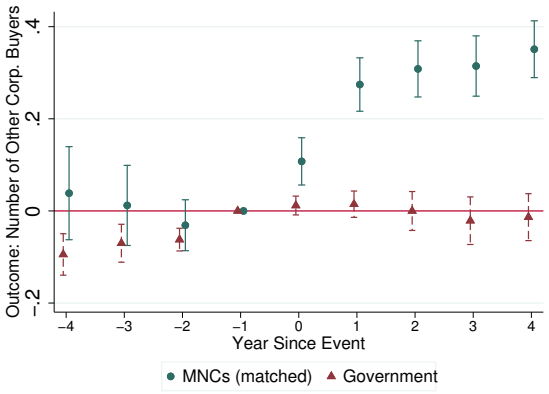
(e) Total Sales, Domestic Exporter



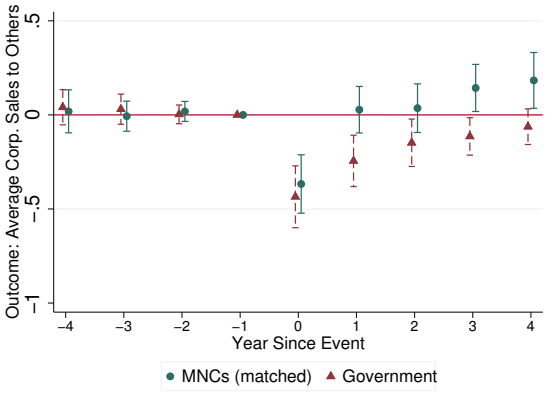
(f) Number of Workers, Domestic Exporter

Figure E1: The Effects of Three Placebo Events on Total Sales and Employment: First-Time Supplying to the Government, a Large Domestic Buyer, or a Domestic Exporter

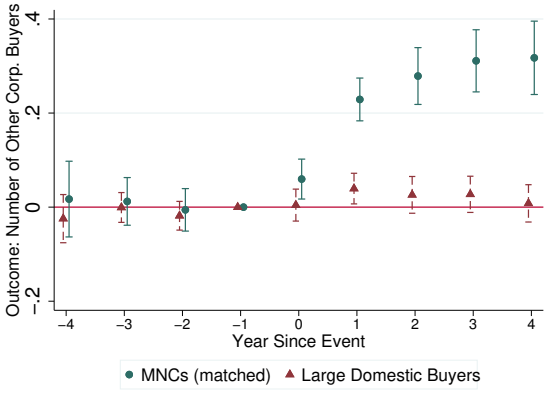
Notes: Figure E1 compares the effects of the event of starting to supply to an MNC with those from three other placebo events, namely starting to supply to (i) the Costa Rican government (panels E1a and E1b); (ii) a large domestic firm (panels E1c and E1d); and (iii) a domestic exporter (panels E1e and E1f). We show these effects for two outcomes variables: log total sales (left-hand side panels) and log number of workers (right-hand side panels). The vertical lines reflect the 95% confidence intervals. For comparability, in each figure, we contrast the effects on the sample of first-time suppliers to the government, large domestic buyer, or domestic exporter to those for a matched subset from the baseline sample of first-time suppliers to MNCs. For example, to construct this subset for the government, we start from the sample of first-time suppliers to the government. Then, for each firm in that sample, we identify the best match in the baseline sample of first-time suppliers to MNCs (where the matching is based on their similarity in supplier characteristics and the demand shock experienced during their corresponding event). For more details on this matching procedure, see Section 5.1 and Tables E5 to E7.



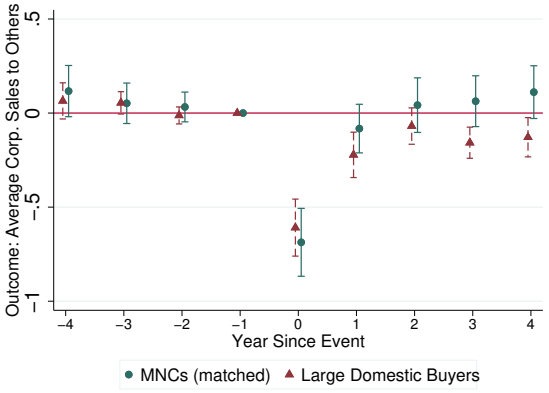
(a) Number Other Buyers, Government



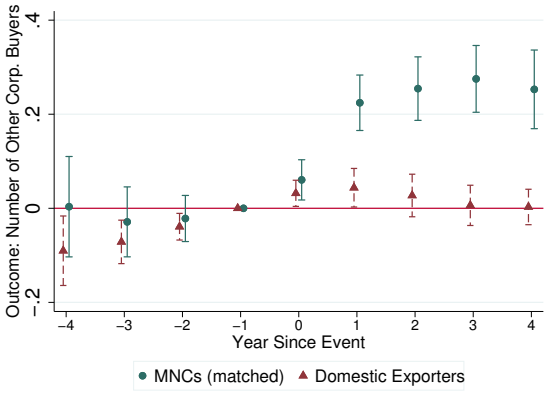
(b) Average Sales Others, Government



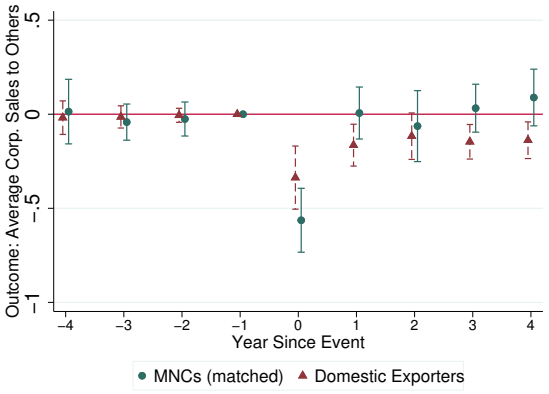
(c) Number Other Buyers, Large Domestic Firm



(d) Average Sales Others, Large Domestic Firm



(e) Number Other Buyers, Domestic Exporter



(f) Average Sales Others, Domestic Exporter

Figure E2: The Effects of Three Placebo Events on the Number of Other Corporate Buyers and Average Sales to Other Corporate Buyers: First-Time Supplying to the Government, Large Domestic Buyer, or Domestic Exporter

Notes: Figure E2 compares the effects of the event of starting to supply to an MNC with those from three other placebo events, namely starting to supply to (i) the Costa Rican government (panels E2a and E2b); (ii) a large domestic firm (panels E2c and E2d); and (iii) a domestic exporter (panels E2e and E2f). We show these effects for two outcomes variables: log number of other corporate buyers (left-hand side panels) and log average sales to other corporate buyers (right-hand side panels). The vertical lines reflect the 95% confidence intervals. For comparability, in each figure, we contrast the effects on the sample of first-time suppliers to the government, large domestic buyer, or domestic exporter to those for a matched subset from the baseline sample of first-time suppliers to MNCs. For example, to construct this subset for the government, we start from the sample of first-time suppliers to the government. Then, for each firm in that sample, we identify the best match in the baseline sample of first-time suppliers to MNCs (where the matching is based on their similarity in supplier characteristics and the demand shock experienced during their corresponding event). For more details on this matching procedure, see Section 5.1 and Tables E5 to E7.

Online Appendix E.3 Model-Based Estimation of the Short and Medium-Run Marginal Cost Elasticity

Online Appendix E.3.1 Total Cost Function Encompasses the Cobb–Douglas and CES Cases

In equation (3) of the paper we assume that the supplier produces a total quantity Q_i with a total cost function given by

$$TC(Q_i) = \kappa_i \left(\frac{Q_i}{\phi_i}\right)^{\gamma+1} \tag{E1}$$

where $\gamma > -1$, ϕ_i refers to physical efficiency, and κ_i is a constant. We show hereafter that when all inputs are flexible, the total cost function in equation (3) encompasses both Cobb–Douglas and general returns to scale CES production functions. Moreover, we also show that whenever all inputs are flexible, $1/(\gamma+1)$ can be interpreted as the returns to scale of the firm. In the remainder of this section, we abstract from the subindex i for simplicity.

Cost function in the Cobb–Douglas case. Define the production function as $Q = \phi L^{\alpha_L} K^{\alpha_K}$ and assume no fixed costs. Let W be the price of L and let R be the price of K. We can then write the total cost function $\text{TC}(Q)$ as:

$$\text{TC}(Q) = \frac{\alpha_L + \alpha_k}{\left(\alpha_L^{\alpha_L} + \alpha_K^{\alpha_K}\right)^{\frac{1}{\alpha_L+\alpha_K}}} W^{\frac{\alpha_L}{\alpha_L+\alpha_K}} R^{\frac{\alpha_K}{\alpha_L+\alpha_K}} \left(\frac{Q}{\phi}\right)^{\frac{1}{\alpha_L+\alpha_K}} = \kappa(W,R)\left(\frac{Q}{\phi}\right)^{\frac{1}{\alpha_L+\alpha_K}} = \kappa(W,R)\left(\frac{Q}{\phi}\right)^{\frac{1}{\xi}},$$

where $\xi = \alpha_L + \alpha_K$ is the returns to scale of the production function, and $\kappa(.,.)$ is a function of the input prices. If we assume that firms are input-price takes, then we can take $\kappa(W,R)$ as a constant κ. Mapping back to equation (3) we notice that $\xi = 1/(\gamma+1)$.

Cost function in the CES case. The general returns CES production function is given by $Q = \phi\left[\alpha_L L^{\rho} + \alpha_K K^{\rho}\right]^{\frac{\xi}{\rho}}$, where ξ is the returns to scale of the production function. Assume again no fixed cost. We can then write the total cost function $\text{TC}(Q)$ as:

$$\text{TC}(Q) = \left[\alpha_L^{\frac{1}{1+\rho}} W^{\frac{\rho}{\rho+1}} + \alpha_K^{\frac{1}{1+\rho}} K^{\frac{\rho}{\rho+1}}\right]^{\frac{1+\rho}{\rho}} \left(\frac{Q}{\phi}\right)^{\frac{1}{\xi}} = \kappa'(W,R)\left(\frac{Q}{\phi}\right)^{\frac{1}{\xi}},$$

where $\kappa'(W,R)$ is again a function of input prices. With the same assumption of input-price-taker behaviour, we can take $\kappa'(W,R)$ to be a constant κ. Mapping back to equation (3) we notice that $\xi = 1/(\gamma+1)$.

Online Appendix E.3.2 Model Derivations

Consider a set of domestic supplier firms indexed by i selling a variety of a good to buyers indexed by j. We assume that supplier i faces an isoelastic demand from buyer j given by $q_{ij} = b_{ij} p_i^{-\sigma}$, where q_{ij} denotes the units of output that buyer j demands from supplier i,

$b_{ij} \equiv \left(b_{ij}^*\right)^{\sigma-1}$ is a demand shifter that depends on the market and buyer j's characteristics, p_i is the price that supplier i charges, and $\sigma > 1$ is the elasticity of demand. The supplier produces a total quantity $Q_i = \sum_j q_{ij}$ with a total cost function given by:

$$TC(Q_i) = \kappa_i \left(\frac{Q_i}{\phi_i^*}\right)^{\gamma+1}$$

where $\gamma > -1$, ϕ_i^* refers to physical efficiency, and κ_i is a constant. The firm charges $p_i = \mu_i MC(Q_i)$, where $\mu_i = \frac{\sigma}{\sigma-1}$ is a constant markup and $MC(Q_i) = \frac{\partial TC(Q_i)}{\partial Q_i}$ is the marginal cost. This means that the price is given by $p_i = \mu_i MC(Q_i) = \mu_i (\gamma+1) \kappa_i Q_i^{\gamma} \left(\phi_i^*\right)^{-(\gamma+1)} = c_{i,0} Q_i^{\gamma} \left(\phi_i^*\right)^{-(\gamma+1)}$, where $c_{i,0} \equiv \mu_i (\gamma+1) \kappa_i$. We can also write total production as:

$$Q_i = \sum_j \left(b_{ij}^*\right)^{\sigma-1} p_i^{-\sigma} = \left[c_{i,0} Q_i^{\gamma} \left(\phi_i^*\right)^{-(\gamma+1)}\right]^{-\sigma} \sum_j \left(b_{ij}^*\right)^{\sigma-1} = Q_i^{-\gamma\sigma} c_{i,0}^{-\sigma} \left(\phi_i^*\right)^{\sigma(\gamma+1)} \left(B_i^*\right)^{\sigma-1},$$

where $B_i^* = \left(\sum_j \left(b_{ij}^*\right)^{\sigma-1}\right)^{\frac{1}{\sigma-1}}$. The previous equation implies:

$$Q_i = c_{i,0}^{\frac{-\sigma}{1+\gamma\sigma}} \left(\phi_i^*\right)^{\frac{\sigma(\gamma+1)}{1+\gamma\sigma}} \left(B_i^*\right)^{\frac{\sigma-1}{1+\gamma\sigma}}. \tag{E2}$$

Denote total revenues as $R_i = p_i Q_i$. We can write R_i as:

$$R_i = c_{i,0} Q_i^{\gamma+1} \left(\phi_i^*\right)^{-(\gamma+1)} = c_{i,0}^{\frac{-(\sigma-1)}{1+\gamma\sigma}} \left(\phi_i^*\right)^{\frac{(\sigma-1)(\gamma+1)}{1+\gamma\sigma}} \left(B_i^*\right)^{\frac{(\sigma-1)(\gamma+1)}{1+\gamma\sigma}}.$$

For future reference note that:

$$B_i^* = c_{i,1} R_i^{\frac{1+\gamma\sigma}{(\sigma-1)(\gamma+1)}} \left(\phi_i^*\right)^{-1}, \tag{E3}$$

where $c_{i,1} \equiv c_{i,0}^{\frac{1}{\gamma+1}}$.

Consider now an event where the supplier i starts selling an amount $R_{i,M} \equiv p_i q_{i,M}$ to a given firm M. Define sales to firms other than M ("sales to others" henceforth) as $\tilde{R}_i \equiv p_i \tilde{Q}_i$, where $\tilde{Q}_i = \sum_{j \neq M} q_{ij}$. Note that under this definition, we have the identity $R_i \equiv \tilde{R}_i + R_{i,M}$. Our objective is to write $\tilde{R}_i$ as a function of R_i, which are two observable variables in our data. To this end, first note that:

$$\tilde{Q}_i = \sum_{j \neq M} q_{ij} = \sum_{j \neq M} \left(b_{ij}^*\right)^{\sigma-1} p_i^{-\sigma} = p_i^{-\sigma} \sum_{j \neq M} \left(b_{ij}^*\right)^{\sigma-1} = Q_i^{-\gamma\sigma} c_{i,0}^{-\sigma} \left(\phi_i^*\right)^{\sigma(\gamma+1)} \left(\tilde{B}_i^*\right)^{\sigma-1},$$

where $\tilde{B}_i^* = \left(\sum_{j \neq M} b_{ij}^{\sigma-1}\right)^{\frac{1}{\sigma-1}}$. The previous equation implies:

$$\tilde{R}_i = p_i \tilde{Q}_i = \left[c_{i,0} Q_i^{\gamma} \left(\phi_i^*\right)^{-(\gamma+1)}\right] \left[Q_i^{-\gamma\sigma} c_{i,0}^{-\sigma} \left(\phi_i^*\right)^{\sigma(\gamma+1)} \left(\tilde{B}_i^*\right)^{\sigma-1}\right]$$

$$= Q_i^{\gamma(1-\sigma)} c_{i,0}^{(1-\sigma)} \left(\phi_i^*\right)^{(\sigma-1)(\gamma+1)} \left(\tilde{B}_i^*\right)^{\sigma-1}.$$

Replacing Q_i from equation (E2), we have:

$$\begin{aligned}\tilde{R}_i &= \left[c_{i,0}^{\frac{-\sigma}{1+\gamma\sigma}} \left(\phi_i^*\right)^{\frac{\sigma(\gamma+1)}{1+\gamma\sigma}} \left(B_i^*\right)^{\frac{\sigma-1}{1+\gamma\sigma}}\right]^{\gamma(1-\sigma)} c_{i,0}^{(1-\sigma)} \left(\phi_i^*\right)^{(\sigma-1)(\gamma+1)} \left(\tilde{B}_i^*\right)^{\sigma-1} \\ &= c_{i,2} \left(\tilde{B}_i^*\right)^{\sigma-1} \left(\phi_i^*\right)^{\frac{(\sigma-1)(\gamma+1)}{1+\gamma\sigma}} \left(B_i^*\right)^{-\frac{(\sigma-1)^2\gamma}{1+\gamma\sigma}},\end{aligned}$$

where $c_{i,2} \equiv c_{i,0}^{\frac{1-\sigma}{1+\gamma\sigma}}$. Replacing B_i^* from equation (E3) we get:

$$\tilde{R}_i = c_{i,2} \left(\tilde{B}_i^*\right)^{\sigma-1} \left(\phi_i^*\right)^{\frac{(\sigma-1)(\gamma+1)}{1+\gamma\sigma}} \left[c_{i,1} R_i^{\frac{1+\gamma\sigma}{(\sigma-1)(\gamma+1)}} \left(\phi_i^*\right)^{-1}\right]^{-\frac{(\sigma-1)^2\gamma}{1+\gamma\sigma}} = c_{i,3} R_i^{-\frac{(\sigma-1)\gamma}{\gamma+1}} \left(\phi_i\right)^{\sigma-1},$$

where $c_{i,3} \equiv c_{i,2} c_{i,1}^{-\frac{(\sigma-1)^2\gamma}{1+\gamma\sigma}} = c_{i,0}^{\frac{1-\sigma}{\gamma+1}}$ and $\phi_i = \tilde{B}_i^* \phi_i^*$. Taking log differences of the optimal sales to others the year before versus τ years after the event, we find:

$$\Delta_\tau \ln(\tilde{R}_i) = \delta \Delta_\tau \ln(\tilde{R}_i + R_{i,M}) + (\sigma - 1)\Delta_\tau \ln(\phi_i), \tag{E4}$$

where $\delta \equiv -\frac{(\sigma-1)\gamma}{\gamma+1}$ and $R_i \equiv \tilde{R}_i + R_{i,M}$. This is equation (4) in the main text (see Section 5.2).

Online Appendix E.3.3 A Brief Discussion on an Extension with Variable Markups

As in the section before, assume that a supplier i sells to buyers indexed by j a quantity q_{ij} such that the total production of supplier i is $Q_i \equiv \sum_j q_{ij}$. Supplier i faces a demand $q_{ij} = D_j(b_{ij}, p_i)$ from each buyer j, where $D_j(.,.)$ is the demand function, b_{ij} is demand shifter (that could be interpreted as an adjustment of the price for the quality or appeal of the good of supplier i, among others) and p_i is the price charged by supplier i. We assume $\frac{\partial log D_j}{\partial log b_{ij}} > 0$.

Profit maximization implies $p_i = \frac{\varepsilon}{1+\varepsilon} MC(Q_i) = \mu(Q_i) mc(Q_i)$, where $\varepsilon \leq 0$ is the elasticity of the aggregate demand that supplier i faces with respect to price p_i, $MC(Q_i)$ is the marginal cost of production, and $\mu(Q_i)$ is a potentially-variable markup.

Denote the sales to buyer j as $R_{ij} = p_i q_{ij}$. Then define $\hat{x} = dlog(x)$ as the percentage change in variable x. The partial equilibrium comparative statics imply that

$$\begin{aligned}\hat{R}_{ij} = \hat{p}_{ij} + \hat{q}_{ij} &= \hat{\mu}(Q_i) + \widehat{MC}(Q_i) + \frac{\partial log D_j}{\partial log p_i} \left(\hat{\mu}\left(Q_i\right) + \widehat{MC}(Q_i)\right) + \frac{\partial log D_j}{\partial log b_{ij}} \hat{b}_{ij} \\ &= \left(1 + \varepsilon_j\right) \hat{\mu}(Q_i) + \left(\left(1 + \varepsilon_j\right) \widehat{MC}(Q_i) + \frac{\partial log D_j}{\partial log b_{ij}} \hat{b}_{ij}\right),\end{aligned} \tag{E5}$$

where $\varepsilon_j \equiv \frac{\partial log D_j}{\partial log p_i}$ is the demand elasticity. $\varepsilon_j < -1$ is empirically supported both in our context (see Online Appendix E.3.4) and in the broader literature (see Head and Mayer, 2014). The argument that follows assumes that $\varepsilon_j < -1$, hence that $\left(1 + \varepsilon_j\right) < 0$.

We are interested under which conditions an increase in sales to other buyers j is at odds with an increase in markups alone. Equation (E5) shows that without a fall in marginal costs and/or an increase in the demand shifter that are large enough to compensate for the rise in markups, a rise in markups alone would lead to a fall in sales to buyer j. As our data does not track prices, quantities, and product characteristics separately, we consider improvements in physical efficiency and quality to be isomorphic.

Online Appendix E.3.4 Inferring σ from DLW (2012)

Table E8: Inferred σ and Returns to Scale Parameter from the Method of DLW (2012)

	Labor	Capital	μ	Returns to scale	σ	Number of obs
	(1)	(2)	(3)	(4)	(5)	(6)
All sectors (pooled)	0.84	0.08	1.25	0.92	5.03	82,094
	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	
Agriculture, forestry and fishing	0.68	0.09	1.12	0.77	9.20	5,229
	(0.01)	(0.01)	(0.02)	(0.01)	(1.38)	
Manufacturing	0.88	0.08	1.19	0.96	6.21	14,922
	(0.02)	(0.00)	(0.03)	(0.02)	(0.83)	
Wholesale and retail trade	0.81	0.08	1.25	0.88	4.98	42,033
	(0.00)	(0.01)	(0.01)	(0.01)	(0.11)	
Transportation and storage	1.00	0.04	1.57	1.03	2.74	1,375
	(0.11)	(0.06)	(0.18)	(0.12)	(1.98)	
Accommodation and food services	0.77	0.07	1.05	0.84	20.88	9,280
	(0.04)	(0.01)	(0.05)	(0.03)	(8.46)	
Information and communication	0.82	0.08	1.21	0.90	5.87	896
	(0.16)	(0.06)	(0.25)	(0.14)	(24.62)	
Professional, scientific and technical	0.88	0.09	1.29	0.98	4.44	3,432
	(0.01)	(0.01)	(0.02)	(0.02)	(0.30)	
Administrative and support services	0.88	0.05	1.21	0.93	5.80	1,998
	(0.03)	(0.02)	(0.04)	(0.03)	(1.51)	
Human health and social work	0.86	0.09	1.36	0.95	3.81	861
	(0.18)	(0.06)	(0.29)	(0.16)	(7.61)	
Other services	0.85	0.02	1.26	0.83	4.92	1,275
	(0.18)	(0.08)	(0.31)	(0.17)	(13.84)	

Notes: Table E8 shows results from the De Loecker and Warzynski (2012) methodology for the economy-wide sample, first pooled across all sectors (see upper panel) and then separately by sector (see lower panel). Column (1) and (2) show the estimated input elasticities for labor and capital (measured as net assets) in a Cobb–Douglas value-added production function. Column (3) shows the markup (μ). Column (4) corresponds to the returns to scale parameter, which is calculated as the sum of columns (1) and (2). Column (5) corresponds to the inferred elasticity of demand (σ). Our assumption of CES demand for buyers implies a constant markup over marginal cost given by $\mu = \frac{\sigma}{\sigma-1}$, which allows us to infer σ from our estimated μ. Finally, column (6) reports the number of observations. Bootstrap standard errors are shown in parenthesis.

We infer the elasticity of demand σ from the markup estimation method of De Loecker and Warzynski (2012) combined with our model. By assuming a Cobb–Douglas production function specification, we first estimate the firm-level markup (μ). Under the assumption of

constant elasticity of demand (σ), we then infer σ from the markup (since the markup is given by $\mu = \frac{\sigma}{\sigma-1}$). Using this approach, we estimate an average markup across sectors of 1.248 (25% over marginal cost). This implies $\sigma = 5.03$. A value of $\sigma = 5$ value is central in the range of estimates used in the international trade literature (see Head and Mayer, 2014).

Online Appendix E.3.5 Additional Estimates of δ and γ

Table E9: Model-Based Estimates of the Marginal Cost Elasticity

	First-time MNC suppliers		First-time Government suppliers		First-time Dom. exp. suppliers		First-time Large dom. suppliers	
	δ	γ	δ	γ	δ	γ	δ	γ
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year of event	-2.702***	2.034	-2.988***	2.867	-1.691***	0.723**	-3.679***	10.473
	(0.550)	(1.255)	(0.919)	(3.411)	(0.419)	(0.308)	(0.588)	(19.210)
1 year after event	-0.654***	0.194***	-1.419***	0.544*	-0.635**	0.187*	-0.906***	0.290**
	(0.158)	(0.056)	(0.534)	(0.316)	(0.296)	(0.103)	(0.322)	(0.133)
2 years after event	-0.435***	0.121***	-1.145*	0.397	-0.493*	0.140	-0.237	0.062
	(0.120)	(0.038)	(0.602)	(0.292)	(0.268)	(0.086)	(0.402)	(0.113)
3 years after event	-0.464***	0.130***	-1.768	0.781	-0.900**	0.287*	-0.753**	0.230*
	(0.156)	(0.049)	(1.493)	(1.176)	(0.387)	(0.159)	(0.365)	(0.137)
4 years after event	-0.433**	0.120**	-1.295	0.473	-1.179*	0.414	-0.966	0.315
	(0.169)	(0.053)	(1.474)	(0.794)	(0.651)	(0.323)	(0.642)	(0.276)
# Observations	116,683	116,683	149,686	149,686	142,161	142,161	130,422	130,422

Notes: Table E9 shows the estimates of δ (the parameter that governs the interdependence between the change in total sales of firm i and its change in sales to others) and the marginal cost elasticity $\gamma = -\delta/(\delta + \sigma - 1)$. Their estimation is based on equation (5). For these estimates, we set $\sigma = 5.03$, which we infer from the average markup in the economy using the methodology of De Loecker and Warzynski (2012). All columns use the total sales and sales to others constructed from the corporate income tax returns. Columns (1) and (2) show our baseline results, where we leverage our event-study specification for the case of first-time suppliers to MNCs (i.e., firm M is the first MNC buyer). These are the same results as those shown in columns (1) and (2) of Table 5. Columns (3) and (4) switch to the event being defined as the first time supplying to the government. Columns (5) and (6) switch to the event being defined as the first time supplying to a domestic exporter. Columns (7) and (8) switch to the event being defined as the first time supplying to a large domestic firm. These events in columns (3) to (8) correspond to the ones described in Section 5.1. In these cases, we further assume that the firm-level productivity does not change after these events. This assumption is in line with our evidence in Figure 3 (left-hand side panels). We obtain standard errors for our estimates of δ using a bootstrap procedure. Since γ is a function of δ, we then apply the delta method to obtain standard errors for our estimates of γ. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix E.4 Ruling Out Changes in Tax Evasion Behavior

Table E10: Similar Compliance in Third Party Reporting After Supplying to an MNC

	Seller-Diff (1)	Buyer-Diff (2)	Mis-Seller (3)	Seller-Diff (4)	Buyer-Diff (5)	Mis-Seller (6)
4 years before event	0.002	0.003	0.002	0.012	0.008	-0.002
	(0.006)	(0.008)	(0.003)	(0.017)	(0.013)	(0.005)
3 years before event	0.002	0.001	0.001	0.010	0.007	-0.004
	(0.007)	(0.007)	(0.002)	(0.013)	(0.010)	(0.004)
2 years before event	-0.002	-0.004	-0.002	0.005	-0.003	-0.000
	(0.004)	(0.005)	(0.003)	(0.009)	(0.007)	(0.003)
Year of event	0.000	0.001	0.000	-0.003	-0.003	0.002
	(0.005)	(0.005)	(0.002)	(0.007)	(0.006)	(0.002)
1 year after event	0.007*	0.006	-0.001	-0.002	-0.004	0.005
	(0.004)	(0.007)	(0.002)	(0.011)	(0.010)	(0.004)
2 years after event	0.008*	0.005	-0.001	-0.006	-0.010	0.006
	(0.005)	(0.006)	(0.002)	(0.015)	(0.015)	(0.006)
3 years after event	0.004	0.000	-0.002	-0.015	-0.018	0.006
	(0.005)	(0.006)	(0.002)	(0.020)	(0.018)	(0.007)
4 years after event	0.014**	0.009	-0.003	-0.012	-0.014	0.008
	(0.006)	(0.006)	(0.003)	(0.024)	(0.023)	(0.009)
Mean Dep. Var. (level)	0.038	0.048	0.012	0.074	0.061	0.013
SD Dep. Var. (level)	0.15	0.15	0.073	0.20	0.17	0.058
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	Yes	No	No	No
Adjusted R^2	0.19	0.12	0.15	0.15	0.10	0.045
# Observations	109,438	109,438	109,438	23,677	23,677	23,677
# Fixed Effects	24,115	24,115	24,115	7,323	7,323	7,323
# Firms	17,129	17,129	17,129	3,472	3,472	3,472

Notes: Table E10 shows the results of running specification (1) adapted to three measures of quality in third-party reporting. For this exercise, we use the raw version of D-151, as opposed to the clean version used in the baseline analysis (see Online Appendix A.1.2). "Seller-diff" is a weighted average of the percentage difference in values reported, across all transactions in a year for which a firm is the seller. The percentage difference is computed as the (maximum value reported-minimum value reported)/(minimum value reported). "Seller-diff" uses as weights the importance of the transaction in that year for the seller. "Buyer-diff" is analogously constructed, this time keeping only transactions for which a firm is the buyer. "Mis-Seller" is defined as (the total number of buyers that reported a given firm as a seller and that are not reported back by the seller)/(the total number of buyers of the seller that are reported by either side). The event is defined as a first time sale to an MNC. Columns (1) to (3) report event study estimates for the sample including both domestic firms that become first-time suppliers to an MNC after 2010 and domestic firms never observed as supplying to an MNC during our entire firm-to-firm transaction data. Clustering of standard errors is at the two-digit sector by province level. Columns (4) to (6) focus only on the sample of domestic firms becoming first-time suppliers to an MNC between 2010 and 2015 and use standard error clustering at event by province level. Robust standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E11: No Changes After the Event in the Share of New Hires in Year t Who Were Either Nonemployed or Informal Workers (or Newly-Arrived Foreign Workers) in Year $(t-1)$

Excludes foreign workers	No (1)	Yes (2)	No (3)	Yes (4)
4 years before event	0.007	0.002	0.010	-0.000
	(0.018)	(0.018)	(0.025)	(0.022)
3 years before event	-0.007	-0.014	-0.012	-0.022
	(0.012)	(0.010)	(0.018)	(0.017)
2 years before event	-0.019**	-0.014	-0.017	-0.017
	(0.008)	(0.009)	(0.010)	(0.011)
Year of event	-0.001	0.000	0.004	0.006
	(0.008)	(0.009)	(0.010)	(0.009)
1 year after event	0.001	-0.003	0.004	0.004
	(0.008)	(0.007)	(0.014)	(0.017)
2 years after event	0.005	0.000	0.014	0.013
	(0.009)	(0.007)	(0.016)	(0.019)
3 years after event	-0.001	-0.003	0.006	0.009
	(0.010)	(0.010)	(0.022)	(0.025)
4 years after event	0.019*	0.014	0.027	0.028
	(0.010)	(0.009)	(0.024)	(0.028)
Mean Dep. Var. (level)	0.0026	0.0025	0.0026	0.0025
SD Dep. Var. (level)	0.0011	0.0010	0.0010	0.0010
Never Suppliers	Yes	Yes	No	No
Adjusted R^2	0.093	0.079	0.087	0.071
# Observations	116,683	116,683	23,961	23,961
# Fixed Effects	25,174	25,174	7,366	7,366
# Firms	18035	18035	3482	3482

Notes: Table E11 shows the effects of starting to supply to an MNC on the share of new workers hired by firm i in year t who could not be found in year $(t-1)$ in the matched employer-employee data (MEED) from CR's Social Security Fund (because they were either nonemployed, informal workers, or coming from abroad in year $(t-1)$). Columns (1) and (2) use the full sample (with both domestic firms that become first-time suppliers to an MNC between 2010 and 2015 and domestic firms never observed as supplying to an MNC), while columns (3) and (4) use the restricted sample (with only the firms that eventually become first-time suppliers to MNCs). The difference between column (1) vs. (2) and columns (3) vs. (4) is that columns (2) and (4) exclude foreign workers. Columns (1) and (3) present a conservative analysis as they already include foreign workers as potential "outsiders" to the MEED. To avoid capturing workers coming directly from the university, we restrict the MEED sample to workers born in 1978 or before (to be at least age 30 in 2008). We also drop workers older than 60 at any point. When we aggregate the data at an annual level, we define a worker's employer in t as the firm where the worker made most of her yearly earnings in t. A "new hire" of firm i in year t is a worker who works at firm i in t but did not work at firm i in $(t-1)$. Given the restrictions described above, if a worker is not observed in the MEED in year $(t-1)$, then the worker was either nonemployed that year or had an informal employer who did not make social security contributions on her behalf (or is a foreign worker who has just entered the Costa Rican labor market, in the case of columns (1) and (3)). A firm that formalizes in year t its already incumbent workers should display a larger share of "new hires" whose employment status in year $(t-1)$ was either nonemployment or informality. Note that this is not a sufficient condition. Firms might be legitimately expanding their workforce by hiring workers who were either nonemployed or informal prior (but without any attachment to their new employer). We use the same firm and four-digit sector $\times$ province $\times$ calendar year fixed effects as in the baseline exercises and the same clustering (two-digit sector $\times$ province in the full sample and province $\times$ event year in the restricted one). ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix F Surveys

Online Appendix F.1 Survey Design and Implementation

We targeted with surveys the domestic firms in three groups. First, we targeted a 20% random sample of the 3,813 domestic firms experiencing an event in the economy-wide sample (3,813 firms that experienced a first-time supplying event with an MNC between 2010 to 2015),[xx] that is, 762 domestic firms. Second, we targeted *all* the winning firms in the "Productive Linkages" Procomer sample (31 firms). Finally, we targeted *all other* domestic firms that started supplying to MNCs through Procomer (385-31=354 firms). It was essential to include the first sample, as it is the one generating our baseline results. The second sample is the basis of one of our main robustness checks. Most of the firms in the last sample are experienced suppliers and can bring a long-term perspective on their relationships to MNCs. In addition to the domestic firms in these three groups, we also targeted *all* the MNCs that served as first MNC buyers to these domestic firms (471, 53, and 163 respectively).[xxi]

Surveys had two core objectives: inquire on specific threats to identification and shed light on features of linkages between MNCs and their new suppliers that are unobservable in administrative data. We designed four surveys: two for domestic firms and two for MNCs. For each type of firm (domestic or MNC), we wrote a short and a long version of the survey. The *short version* of the survey focuses only on the core topics. The *long version* requests more details on the core topics, in addition to more information useful for context.

The co-authors of this project designed the survey instruments. BCCR, Procomer, and CINDE provided feedback that improved the initial drafts.[xxii] We first wrote the questionnaires in English. Once we refined the order, structure, and wording of questions, a native Spanish speaker translated the questionnaires. We only conducted one round of surveys, all of which took place between June and September of 2018.

Long version. Long surveys were conducted in person and lasted 45 minutes to an hour. Procomer or CINDE established the first contact with firms by email. The email contained an official letter from BCCR describing the study and guaranteeing a fully-secured treatment of the data collected. Once a firm agreed to participate, our team would be granted permission

[xx] There are 3,813 domestic firms that became first-time suppliers to 471 MNCs. However, in the main event-study regression (1) studying the impact on total sales, only 3,697 of these domestic firms are used in the estimation, with the rest being dropped due to the fine set of fixed effects used.

[xxi] These three sets of MNCs are overlapping as the same MNC can trigger events of the three types: economy-wide (unmediated), mediated by Procomer after 2009 and in our sample of analysis, or mediated by Procomer in any year and not part of our sample of analysis. Note also that some MNCs trigger events for more than one supplier; that explains why the number of MNCs triggering events can be smaller than the number of domestic firms experiencing the events. That said, it can also be that some suppliers sell to more than one MNC in the first year in which they sell to at least one MNC (the year of the event); that explains why the number of MNCs triggering events can also be larger than the number of domestic firms experiencing the events.

[xxii] All three entities frequently survey firms in CR.

to contact the firm directly in order to set up the survey meeting.[xxiii]

We decided to apply the long version of the survey to the firms involved in the "Productive Linkages" design, that is to the 31 domestic suppliers experiencing the eligible Procomer events and the MNC buyers that triggered those events. This choice has two advantages. First, these are firms for which we had more reliable contacts (from either Procomer or CINDE); this improved the chance of a positive response to our request. Second, all of these firms had other deals (with domestic suppliers/MNCs) that were not mediated by Procomer. Applying the long version of the survey to these firms allowed us to inquire whether deals mediated by Procomer were different or not from unmediated deals.

The first in-person surveys served as the pilot, allowing the team to test not only the questionnaire, but also the survey protocols and logistics. For this reason, at least one of the co-authors joined these first meetings. Once this piloting phase ended, a team of two enumerators split the remaining in-person surveys among themselves. In the summer of 2018, both enumerators were in their final year of undergraduate studies in economics at the main national university. Enumerators went unaccompanied to their meetings, to avoid any risk of answers being influenced by either a Government official or our team.

The team agreed with BCCR, CINDE, and Procomer to share only the aggregated findings of the surveys. Enumerators made sure that firms knew that their specific answers were not to be shared with these public entities. This measure was meant to create an environment of trust and elicit truthful responses. Also, as almost all questions did not refer to the "Productive Linkages" program but focused on MNC-supplier relationships more broadly, enumerators clarified that surveys were not meant for program evaluation.

Figure F1 is a collage of four photographs taken by the authors during survey visits to four domestic suppliers to MNCs. All four firms have responded to the in-person long survey. The collage showcases the diversity of the surveyed domestic firms.

Short version. Short surveys were designed to be filled in online through a Google Form and take 15 to 20 minutes. The person filling in the survey would do so in the absence of any Government official or team member. In the invitation email, we included an official phone number and email address, in case the firm had any inquiries. We received few inquiries - of those, most were concerned whether the survey was legitimate or an imposture.

The invitation to participate in the online survey was sent to the firms that we targeted from the economy-wide sample of events (762 domestic firms and 471 MNCs) and to the firms involved in Procomer events that are not part of our sample of analysis (354 domestic firms and 163 MNCs).[xxiv]

Depending on the firm, the invitation was sent by Procomer, CINDE, or BCCR. Procomer and CINDE had readily-available email addresses of specific key employees in each firm. As

[xxiii] Procomer contacted domestic suppliers and MNCs as part of their "Productive Linkages" database. CINDE contacted MNCs under the Free Trade Zone regime. Unless a firm agreed to participate in the survey, the email address of their contact was not revealed to our team.

[xxiv] Again, note that while the sets of domestic firms in these different samples are disjoint, the sets of MNCs triggering the events are not.

Procomer and CINDE contacted firms in their portfolio, this also reassured firms on the intention of the survey. Both factors significantly increased the likelihood of an answer.

BCCR contacted firms in the economy-wide restricted sample. Our team had to search for appropriate contacts from scratch. This step was the most challenging in the implementation of the surveys. Whenever firms could be found online with more than a phone number and a physical address, the most direct contact available was either a general email address (e.g., info@firm.cr) or a contact form on the website. To increase the likelihood of an answer, the two enumerators made calls to all firms with a phone number, describing the survey and requesting a direct email address of the person most qualified to answer the survey. Despite calls being made from an official BCCR number, many firms distrusted the calls and refused to share a personal email address.

We made up to six attempts to contact each firm. Depending on the available/preferred mode of contact, these attempts were either callbacks or email reminders. An unexpected challenge for the short survey came from the fact that certain corporate anti-virus software directed our email to the spam folder of the recipient, as it contained the link to the survey. Recipients were also advised against clicking on the link, to avoid phishing or malware downloads. Receiving the email from an official email address was not sufficient reassurance for some firms. One goal behind our persistent attempts was to bring reassurance on the safety of participating in the survey.

It is important to emphasize that surveys to both MNCs and domestic suppliers required specific knowledge about relationships between MNCs and domestic suppliers. Our ideal respondent was the employee whose job attributes and tenure with the firm allowed him/her to provide the most accurate answers. Questions to MNCs did not require the respondent to witness the first linkage to a specific domestic supplier. However the respondent had to be well-informed on the local procurement practices of the MNC. For this reason, we aimed to survey the supply chain (procurement, operations) manager of each MNC.

For domestic suppliers, part of the questions was retrospective. This required from the respondent to have worked at the firm before and during the first deals with MNCs. Given this constraint and the fact that most firms are small family-owned businesses, the ideal respondent was the founder of the firm (who is typically the general manager as well). The retrospective nature of the survey to domestic suppliers is unlikely to have jeopardized answer quality for two reasons. First, most questions did not ask for specific details on the first deal with an MNC, details which might otherwise be affected by the time lag. Second, survey answers show that the first deals with MNCs were transformative for the domestic firm. Thus, it is unlikely for the firm founder to misremember the circumstances of those deals.

We went to great lengths to identify the most suitable respondent inside each firm and make sure this person actually answered the survey. The supply chain manager of the MNC and the owner of the domestic firm are typically busy and inaccessible. Most firms do not even publicize the names of people in these positions, as to avoid their being pursued with unsolicited business proposals. It took considerable effort to ensure that our survey was known to

and answered by the right person within each firm.

Figure F1: Four Examples of Domestic Suppliers to MNCs

Notes: Figure F1 is a collage of four photographs taken by the authors during survey visits to four domestic suppliers to MNCs. All four firms have responded to the in-person long survey. Firms in the top row supply automotive mechanic services (left-hand side firm), and retail and maintenance of precision cutting tools (right-hand side firm). These firms have under five full-time employees, their facilities are modest and space-constrained. Their deals with MNC buyers are discontinuous, occurring mostly when MNCs have an emergency. Firms in the bottom row specialize in tailored precision machining (left-hand side firm), and tailored industrial supplies (right-hand side firm). These firms employ between 10 and 20 full-time employees, the layout of their plant is more spacious and organized, and they display more capital and standardization in processes. Their relationships with MNCs are longer-lasting and involve products or services that relate to the core activity of the MNC.

Online Appendix F.2 Survey Response Rate and Representativeness

In Table F1 we report the number of firm responses to our four surveys: the two versions of the survey to domestic firms (the long and the short) and the two versions of the survey to MNCs (again, the long and the short).

Response rate for MNCs. These 58 MNCs have triggered a total of 645 (distinct) events out of our economy-wide sample of 3,813 events (or 17%). These 58 MNCs include 51 of the 471

Table F1: Number of Firm Responses

Number of responses	Long survey	Short survey	Total
Domestic	15	91	106
MNCs	23	35	58
Total	38	126	**164**

Notes: This table summarizes the number of survey responses by survey version (long or short) and target (domestic supplier or MNC). Out of a total of 164 completed surveys, 38 were completed in person and 126 online. Out of the same total of 164 completed surveys, domestic suppliers filled in 106 and MNCs filled in 58.

MNCs triggering these 3,813 events (or 11%). For the Procomer sample of analysis, these 58 MNCs cover 21 of the 31 events of interest (or 68%) and include 21 of the 53 MNCs triggering these 31 events (or 40%). When we focus on Procomer events other than those in the sample of analysis, 32 of these 58 MNCs trigger 122 events of a total of 354 (other) Procomer events (or 34%). As a percentage of the number of MNCs having (other) deals mediated by Procomer, these 32 MNCs represent 20% (of a total of 163 MNCs).

The same MNC can trigger events in all three samples. The 58 responses from MNCs trigger 788 (788=645+21+122) events or 19% of the 4,198 events targeted (4,198=3,813+31+354) and 11% of the 527 distinct MNCs targeted (the union of 471, 53, and 163 MNCs).

Response rate for domestic firms. Of the 106 domestic firms answering the survey, 34 are part of the economy-wide sample, 12 are part of the Procomer sample of analysis, and the remaining 60 are part of the Procomer sample of suppliers not kept for analysis.

Out of the 762 targeted domestic firms and their associated economy-wide events, we have a response rate of 4%.[xxv] If we refer to the overall sample of 3,813 domestic firms and their associated economy-wide events, we have a response rate of 1%. Note, however that only 762 of these 3,813 firms were actually contacted. Of the targeted 31 domestic firms and their associated winning events in the Procomer sample of analysis, our 12 responses cover 39%. When we focus on Procomer suppliers other than those in the sample of analysis, the 60 surveyed suppliers represent 17% of the total of 354 targeted suppliers (or events).

Overall, the 106 responses from domestic firms cover 9% of the total of 1,147 domestic firms (events) targeted (1,147=762+31+354).

Combined response rate. The combined response rate is defined as the percentage of events on which we have a survey response from either the domestic firm experiencing the event or the MNC triggering that event.

Of the 3,813 events that create our economy-wide sample, we have information on 650 events, or 17%. Of the 31 events in the Procomer sample of analysis, we have responses from either the supplier or the MNC buyer for 24 events, that is, 77% of events. Of the 354 events mediated by Procomer but not in the sample of analysis, we have responses from either the supplier or the MNC buyer for 160 events, that is, for 45% of events.

Of the 4,198 the events (4,198=3,813+31+354) of interest, we have information from either

[xxv] When it comes to domestic firms, percentages out of number of domestic firms or events are identical as each domestic firm is mapped one-to-one to an event.

the supplier or the MNC for 834 (834=650+24+160) events, that is, for 20% of events.

Table F2: Summary of Firm Response Rates

Sample	(1) Economy-Wide	(2) Procomer Sample	(3) Procomer Other	(4) All Samples
Version	Online	Face-to-face	Online	
Domestic (% targeted firms)	4%	39%	17%	9%
Domestic (% targeted events)	4%	39%	17%	9%
MNCs (% all firms)	11%	40%	20%	11%
MNCs (% all events)	17%	68%	34%	19%
Combined (% all events)	17%	77%	45%	20%

Notes: This table summarizes the survey response rates by firm type (domestic supplier or MNC), as a percentage of either the relevant number of firms or events, and with respect to three firms/events samples (firms/events targeted and contacted of all the economy-wide sample, all firms/events in the economy-wide sample – targeted or not –, all firms/events in the Procomer sample of analysis, all other firms/events in the Procomer set of deals, not part of the sample of analysis). Note that all MNCs from the economy-wide sample and all firms/events in the Procomer set of deals were targeted and contacted. The only firms for which only a 20% sample was targeted and contacted were the domestic firms experiencing economy-wide events.

Table F2 summarizes the statistics just discussed. Three patterns stand out. First, comparing column (1) to columns (2) and (3) one notices the higher response rates achieved for firms in the Procomer database, relative to the firms in the economy-wide sample whose contacts we searched for ourselves online. This is due to the higher quality of the contacts in the Procomer database. Second, we have achieved significantly higher response rates for face-to-face surveys than for online surveys. This is due to a certain distrust of survey invitations sent by email and to be filled in by clicking on a link (that the receiver fears to be a virus). Third, when one allows for an event to be described by either the domestic supplier experiencing the event or by the MNC triggering it, we reach a higher overall coverage of events.

While the response rate might appear low (particularly for the online surveys to domestic firms in the economy-wide sample), one should consider the following factors. Business surveys are often challenged with low response rates. Whenever businesses are not mandated to take part in a survey, they often refuse to disclose proprietary information. The type of firms targeted by our surveys are either MNCs (hence firms with strict confidentiality rules) or domestic firms (of which, many preoccupied about revealing their trade secrets or suspicious over being contacted by email). Our survey was also not incentivized. Given the type of firms we targeted, it was unfeasible to provide a financially-meaningful incentive. Finally, it was essential to the success of our survey for it to be filled in by the appropriate person within

each firm. This factor was an important constraint to us, as it was generally difficult to reach these firms and particularly so, to reach key employees.

Representativeness of domestic firm respondents. In Table F3 we compare the 106 domestic firms that have participated in our survey to the 4,092 domestic firms of interest who have not participated. Recall that most of these 4,092 non-respondents have not been actually contacted, as we have only contacted a 20% random sample of the 3,813 domestic firms experiencing economy-wide events. We pool across firms coming from the three samples (economy-wide events, Procomer events in the sample of analysis, and Procomer events not in the sample), but the same patterns apply to comparisons of surveyed vs. not surveyed firms in the same sample. It is only for brevity that we show the pooled comparison alone.

Table F3: Comparison Between Surveyed and Not Surveyed Domestic Firms in Terms of Firm Size and Firm Performance

	Surveyed	Not surveyed	Difference
Number of Workers	23.28	23.58	-0.304
	(26.48)	(54.75)	(6.67)
Total Sales	2.241	1.773	0.467
	(3.86)	(4.57)	(0.56)
Value Added Per Worker	13.08	13.28	-0.200
	(11.11)	(62.36)	(7.57)

Notes: Table F3 compares the domestic firms that have participated in our survey to the domestic firms that have not in terms of their number of workers and total sales in 2009. The total sales are in millions of CPI-deflated 2013 U.S. dollars. The value added per worker is in thousands of CPI-deflated 2013 U.S. dollars. Standard deviations in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

From Table F3 we learn that the differences in firm size and firm performance between surveyed and non-surveyed domestic firms are not statistically significant. It is reasonable to expect that the answers of the responding domestic firms are representative for the overall samples of interest.

Representativeness of MNC respondents. In Table F4 we compare the 58 responding MNCs (who have accepted our survey invitation) to the remaining 469 MNCs who we have invited to participate in our survey, but who have either declined or have not replied to our request (typically because the email address was incorrect or because it was a generic email address). We pool surveyed vs. not surveyed MNCs across the three samples (economy-wide events, Procomer events in the sample of analysis, and Procomer events not in the sample), but the same patterns apply to comparisons of surveyed vs. non-surveyed MNCs in the same sample. It is for brevity that we report the pooled comparison alone. Pooling is particularly inconsequential for MNCs as the same MNC can be part of all three samples (i.e., triggering events for domestic firms in the three samples).

Table F4: Comparison Between Surveyed and Not Surveyed MNCs in Terms of Size, Performance, and Free Trade Zone Status

	Surveyed	Not surveyed	Difference
Number of Workers	620.5	427.8	192.8
	(939.24)	(1051.06)	(165.90)
Total Sales	144.0	47.36	96.64***
	(431.90)	(81.31)	(25.49)
Value Added Per Worker	69.15	56.13	13.02
	(152.69)	(283.64)	(43.53)
Free Trade Zone	0.523	0.332	0.190*
	(0.51)	(0.47)	(0.08)

Notes: Table F4 compares the MNCs who have participated in our survey to the MNCs who have not in terms of their number of workers, total sales, value added per worker, and Free Trade Zone status (1 if the MNC is part of the Free Trade Zone regime), all averaged across all years of activity in CR. The total sales are in millions of CPI-deflated 2013 U.S. dollars. The value added per worker is in thousands of CPI-deflated 2013 U.S. dollars. Standard deviations in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table F4 shows that surveyed MNCs have, on average, higher total sales than non-surveyed MNCs and are more likely to be part of Free Trade Zones (FTZs). These differences reflect the fact that our most reliable contacts of MNCs came from CINDE and Procomer, who work closely with MNCs in FTZs. MNCs in FTZs tend to be larger and more productive. Given our topics of interest, it is unclear how this affects the representativeness of their answers. Finally, by comparing Tables B1 and F13 we notice that the countries of global ultimate ownership of the MNCs are similar between those of all the MNCs triggering events economy-wide and the surveyed MNCs.

Online Appendix F.3 Survey Questions and Answers

Two features of our survey structure deserve mentioning. First, for a given type of survey (to domestic suppliers or to MNCs), questions in the long version are a strict superset of questions in the short version. The overlapped questions are identical between the two versions (no change in wording, no change in the order of proposed answers). This allows us to pool answers from the long and short versions. Second, across the two survey types, some key questions are mirrored. For instance, both domestic suppliers and MNC are asked about the potential help provided by MNCs to first-time suppliers. This allows to learn about the same topic from both perspectives.

Before analyzing the answers, we had to standardize the responses to open ended questions and perform some minimal quality checks on answers provided. One example of a quality check relates to the compatibility between a given question asked and the answer provided.

E.g., one question asks MNCs about what they believe to be the most important benefit to domestic firms upon becoming their suppliers. Two MNCs provided answers that refer to the most important benefit *to the MNC* when having more domestic suppliers and had to be discarded. Another quality check makes sure that answer provided in the "Other: _____" option was not actually already covered by existing options that were not selected.

In what follows, we pool answers across sample sources. We do so because answers did not differ substantively among domestic firms/MNCs coming from different samples.

Online Appendix F.3.1 Survey Answers from Domestic Firms

Table F5: Summary of Job Titles for Respondents to the Survey to Domestic Firms

Position	Frequency	Percent
CEO/President/Founder	58	54.7
Sales/Marketing/Client Outreach Manager	15	14.2
Other Unit Manager	11	10.4
Operations/Supply Chain Manager	9	8.5
Professional/Analyst	5	4.7
Assistant to CEO/President/Founder	4	3.8
Senior Partner	4	3.8
Total	N=106	100.0

Notes: This table summarizes the job titles (positions) of respondents to the survey to domestic firms. We have grouped job titles under seven categories. Under "CEO/President/Founder," one can find job titles such as Owner ("Dueño"), President ("Presidente"), or General Manager ("Gerente General"). Under "Sales/Marketing/Client Outreach Manager," one can find job titles such as Commercial Director/Manager ("Gerente/Director Comercial") or ("Gerente Mercadeo y Ventas"). Under "Other Unit Manager," one can find job titles such as Finance Director ("Directora Financiera"), R&D Manager ("Gerente de Investigación y Desarrollo"), or Accounting Supervisor ("Supervisor de Contabilidad"). Under "Operations/Supply Chain Manager," one can find job titles such as Operations Director ('Directora de Operaciones'") or Logistics Manager ("Jefe de Logistica"). Under "Professional/Analyst," one can find job titles such as Technical Advisor ("Asesor Técnico") or Business and Operations Analyst ("Analista de Negocios y Operaciones"). Under "Assistant to CEO/President/Founder," one can find job titles such as Assistant to General Manager ("Asistente de Gerencia/Asistente de Gerencia General"). Under "Senior Partner," one can find job titles such as Partner ("Socio") or Managing Partner ("Socio Director").

Question 1: "Your position in the firm." Question type: open-ended. Survey versions: long and short (N=106). Responses are summarized in Table F5.

Question 2: "Did your firm expect multinational buyers to be different from domestic buyers?" Question type: Dichotomous. Survey version: only long (N=15). 100% of answers were positive ("Yes, our firm expected the contracts with multinational buyers to be markedly different from those with domestic buyers.") Please note that we emphasized that the question referred to expectations of the firm *before* the first contract with an MNC.

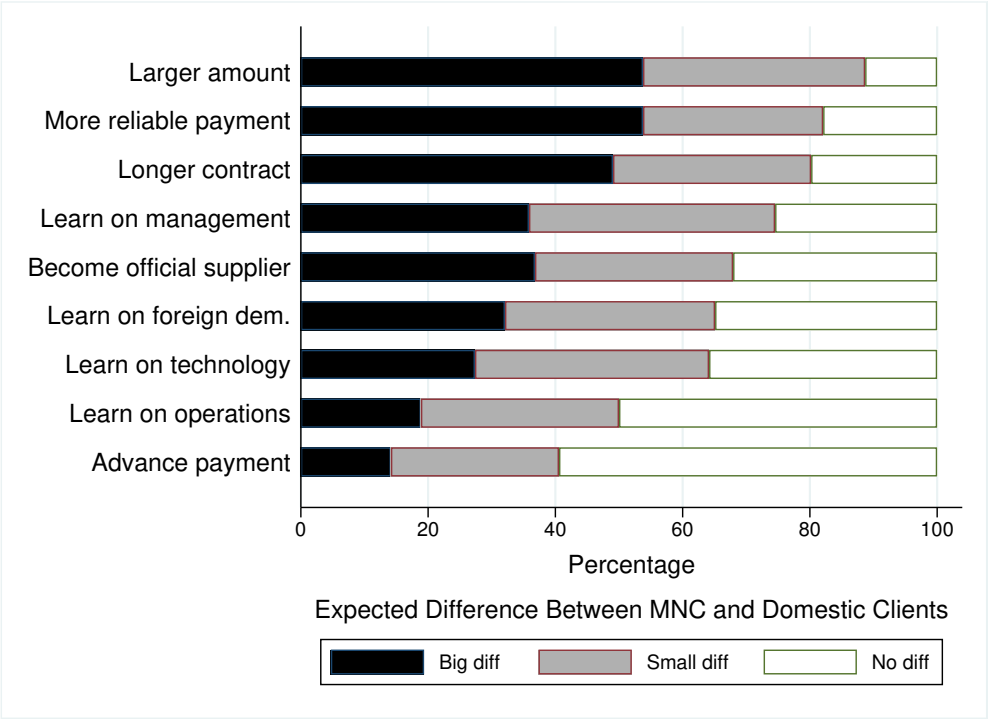


Figure F2: Question 3: Before the first contract with an MNC, how did your firm expect MNC buyers to be different from domestic buyers?

Notes: This graph summarizes the answers of 106 domestic firms to the survey question "Before the first contract with an MNC, how did your firm expect MNC buyers to be different from domestic buyers?" Percentages do not need to sum up to 100 across options, as each firm had to rate the extent to which each proposed option applied to the firm. Percentages only need to sum up to 100 for each option.

Question 3: "Before the first contract with a multinational firm, how did your firm expect multinational buyers to be different from domestic buyers? Complete all the options, selecting whether you agree with the proposed difference. "Our firm expected contracts with multinationals...." Question type: Likert-type scale. Survey versions: long and short (N=106).

For each proposed difference, the respondent had to choose one of three options of answer: "No, this difference was not expected," "Yes, this was a **small** expected difference," "Yes, this was a **large** expected difference." We proposed nine potential differences (in order):"...would be more reliable in terms of payment," "... would help us with financing in advance," "... would order larger amounts," "... would have longer-term contracts," "... would help us improve management practices," "...would help us improve our technological knowledge," "...would help us improve our logistics and inventories," "... would help us learn about foreign demand, which would help improve our export performance," "... would allow us to become an official supplier not only for the affiliate in CR, but also for affiliates in other countries." Figure F2 summarizes the answers to Question 3.

Question 4: "Before the first contact with a multinational in CR: Did the firm plan and make special arrangements to establish a relationship with this type of firm? Please, choose a SINGLE answer." Question type: Dichotomous. Options (in order): "Yes, our firm planned and adopted special measures in advance to start supplying to the multinationals" or "No, our

firm did not take special measures to start supplying to the multinationals." Survey section: "On special preparations before establishing a relationship with multinationals in CR." Survey versions: long and short (N=106). 47 domestic firms chose the negative answer (44%) and 59 domestic firms chose the positive answer (56%).

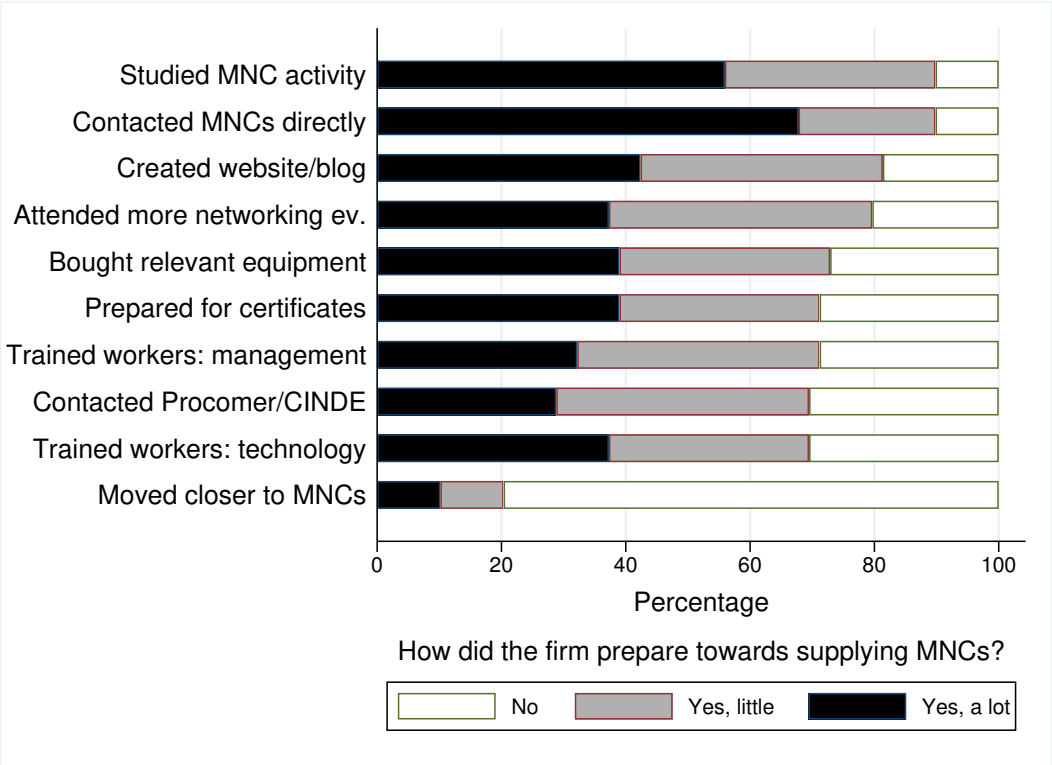


Figure F3: Question 5: How did your firm prepare to supply to multinationals?

Notes: This graph summarizes the answers of 59 domestic firms to the survey question "How did your firm prepare to supply to multinationals (before establishing the first contact)?" The other 47 domestic firms had answered that they had not taken any special measures towards starting to supply to an MNC. Percentages do not need to sum up to 100 across options, as each firm had to rate the extent to which each proposed option applied to the firm. Percentages only need to sum up to 100 for each option.

Question 5: "How did your firm prepare to supply to multinationals? (before establishing the first contact). Complete all the options, choosing an answer that best describes whether a given measure was taken by your firms "Before the first contact with a multinational, our firm ..." This question was a follow-up to Question 4. If a firm answered negatively to Question 4, this question would be automatically skipped.

For each proposed measure, the respondent had to choose one of three options of answer: "No, our firm did not do this," "Yes, our firm did this but very little," or "Yes, our firm was very involved in this change." We proposed ten measures that the firm might have undertaken in preparation of approaching MNC buyers (in order): "... studied the activity of the multinational to adapt and offer its product to them," "... trained its workers on technologies relevant to supplying to multinationals," "... trained its workers on administrative or management practices relevant to supplying to multinationals," "...began preparing for certifications that were relevant to supplying to multinationals," "... bought machinery that potentially necessary to supplying to multinationals," "... changed its location to be closer to multinationals," "... started participating in more business events to try to find multinational buyers,"

"... started contacting multinationals directly, trying to present its products / services," "... created a website / blog / social networking page to be easier to find by multinationals," "... approached Procomer / CINDE / MEIC to request assistance in the search for multinational buyers." Figure F3 summarizes the answers to Question 5.

Question 6: "Was there any notable change within your firm just before the first contract with a multinational that resulted in your firm starting to supply to that multinational? If the answer is YES, provide details about the unexpected event. If the answer is NO, skip to the next question." Question type: open-ended. Survey versions: long and short (N=106). 100 domestic firms (94%) answered negatively (variations of "N/A," "No," "No change"). Six domestic firms (6%) answered positively, offering details on the said change. Here is an example of one of these positive answers: "Yes, we started advertising our products on a new website and placed ads of the firm in the main search engines." The described changes do not challenge the interpretation of our estimates as capturing the treatment effect of becoming a supplier to MNCs.

Question 7: "To your knowledge, did your firm face difficulties in establishing the first contracts with multinational buyers? Please choose ONE option only." Question type: Dichotomous. Options (in order): "NO, it was relatively easy to start supplying to multinational buyers" or "YES, we faced difficulties in trying to start supplying to multinational buyers." Survey section: "Possible difficulties when trying to establish the first contracts with multinationals." Survey versions: long and short (N=106). 63 domestic firms (59%) provided a negative answer, 43 domestic firms (41%) provided a positive answer.

Question 8: This question was a follow-up to Question 7. If a firm answered negatively to Question 7, this question would be automatically skipped. Question: "Why was it difficult to get a first contract with a multinational? Consider all the potential answers, indicating how important a given explanation was for this difficulty." Question type: Likert-type scale. Survey versions: long and short (N=106 surveys, but 43 answers in practice).

For each proposed measure, the respondent had to choose one of four options: "Very important/Crucial," "Important," "Perhaps a bit important, not central," or "Irrelevant." We proposed eight potential reasons (in order): Multinationals "were difficult to contact," "were not interested in sourcing locally," "did not know the firm and did not trust the product / service offered," "expected types of products or services that the firm did not offer," "expected a quality of products or services that the firm could not offer at that time," "required products or services produced faster than the firm could commit," "expected lower prices than those that this firm could offer," "required products or services for which the firm had to make large investments (for example, buy a machine, expand the scale of production)." Figure F4 summarizes the findings from Question 8.

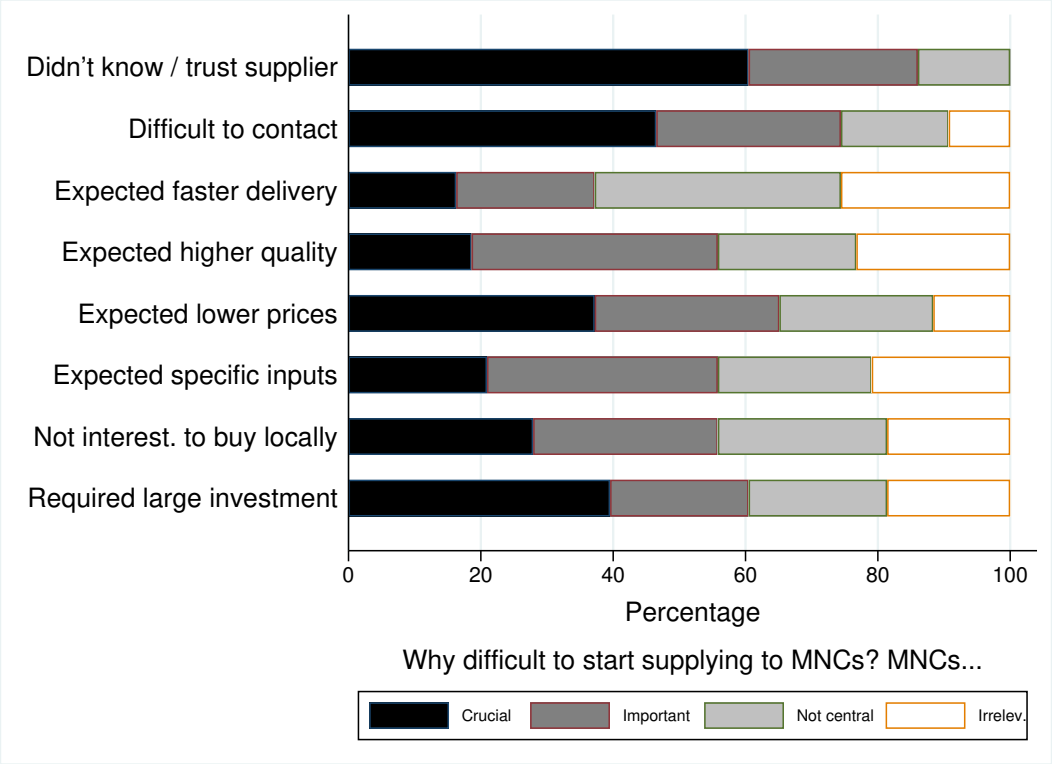


Figure F4: Question 8: Why was it difficult to get a first contract with a multinational?

Notes: This graph summarizes the answers of 43 domestic firms to the survey question "Why was it difficult to get a first contract with a multinational?" The other 63 domestic firms had answered that it was not particularly difficult to establish a contract with a multinational. Percentages do not need to sum up to 100 across options, as each firm had to rate the extent to which each proposed option applied to the firm. Percentages only need to sum up to 100 for each option.

Question 9: "What were the changes that the firm experienced when becoming a supplier to its first multinational buyers? Select all the answers that are TRUE." Question type: Multiple-choice. Survey section: "During and immediately after the first contracts with multinational buyers." Survey versions: long and short (N=106).

The question allowed for multiple answers among ten options (in order): "The multinational firm required specific products or services, so we expanded our portfolio of products or services that we offered," "We completely replaced the products or services that we previously offered, with those demanded by multinationals," "We continued to offer the same products or services, but the quality and / or the price changed," "We decided to expand our productive capacity in order to meet the larger orders from multinationals," "We hired more highly qualified workers to help us better serve multinational buyers," "Our workers had to work harder and longer hours, because the expectations of the multinational were higher than they were used to," "We changed our sourcing strategy (for example, we sourced differently locally, imported more)," "We learned from the multinational about management practices or organization," "We learned from the multinational about technology relevant for our products or services." Figure F5 summarizes the answers to Question 9.

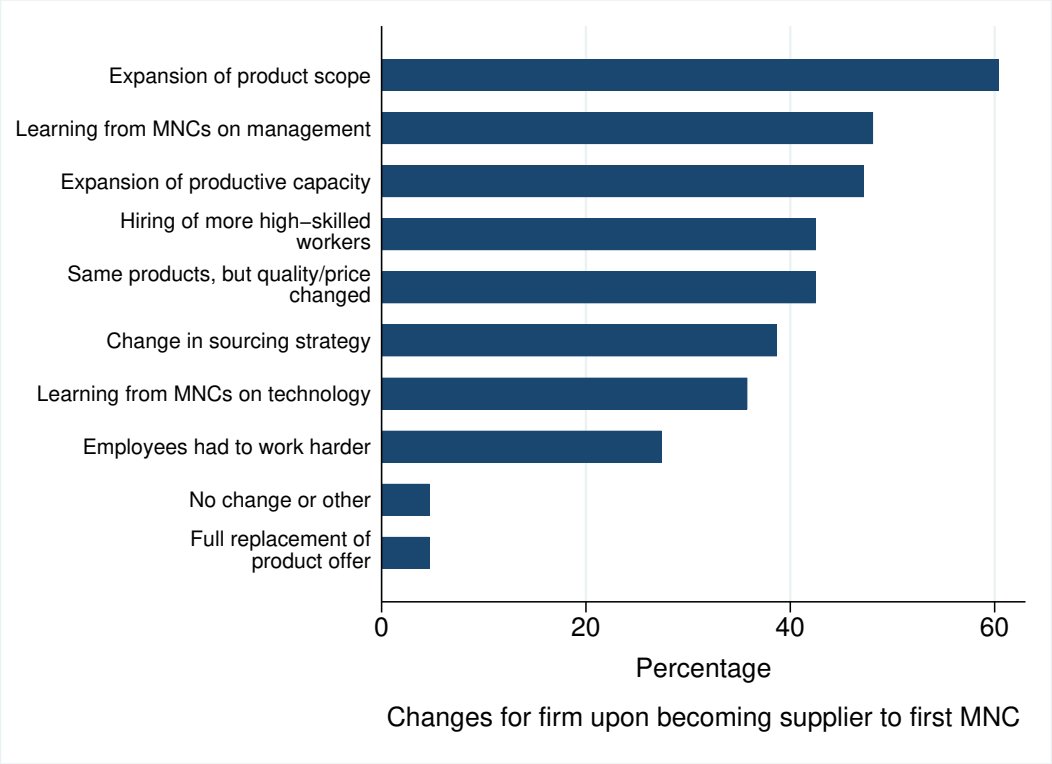


Figure F5: Question 9: What were the changes that the firm experienced when becoming a supplier to its first MNC buyers? Select all the answers that are TRUE.

Notes: This graph summarizes the answers of 106 domestic firms to the survey question: "What were the changes that the firm experienced when becoming a supplier to its first multinational buyers? Select all the answers that are TRUE." Note that percentages do not need to sum up to 100 across options, as each firm could select all options that applied.

Question 10: "Please provide more details about the most important change that the firm experienced upon becoming a supplier to multinationals." Question type: Open-ended. Survey section: "During and immediately after the first contracts with multinational buyers." Survey versions: long and short (N=106). Answers to this question were unguided, hence in order to be summarized had to be analyzed and grouped by main topic. Table F6 summarizes the most frequent changes.

Question 11: "How did the first multinational buyers help the firm to undergo these changes? Mark all the answers that are TRUE." Question type: Multiple-choice. Survey section: "Possible help from the multinational." Survey versions: long and short (N=106).

The question allowed for multiple answers among nine options (in order): "The multinational did not participate directly, did not provide any explicit help, we dealt with the changes on our own," "The multinational provided a model ("blueprint") of the desired product or service or some other relevant documentation," "Employees of the multinational visited our firm and helped us with advice in the adjustment process (for example, the multinational conducted audits of the firm and guided it on ways to improve)," "Our employees made visits to the multinational to observe parts of their production that were relevant to the input we were supplying to the multinational," "The multinational had standardized training programs that

Table F6: Question 10: What was the most important change experienced upon becoming a supplier to MNCs?

Most Important Change	Frequency	Percent	Cum.
Improved management/organizational practices	24	22.64	22.64
Improved product/service quality, established quality management system	16	15.09	37.74
Increased productive capacity / expansion abroad	13	12.26	50.00
No important change	9	8.49	58.49
Other	9	8.49	66.98
Improved efficiency / delivery times	8	7.55	74.53
Improved sourcing / supply chain strategy	8	7.55	82.08
Expanded product / service scope	7	6.60	88.68
Had to improve firm financing ability	4	3.77	92.45
Acquired new machinery / equipment	3	2.83	95.28
Improved job security / worker safety	3	2.83	98.11
Worked longer hours	2	1.89	100.00
Total	N=106	100	

Notes: This table summarizes the answers of 106 domestic firms to the survey question: "Please provide more details about the most important change that the firm experienced upon becoming a supplier to multinationals." As this question was open, the team had to organize answers by topic.

they offered to our employees," "The multinational put us in contact with another firm that supplies similar products or services to the multinational in other locations, to advise us on best practices," "The multinational has lent us money or paid us in advance so that we can make the necessary investments," "The multinational is the one that bought the specific machinery necessary to supply the good / service and they have lent / rented the machinery to us," "Other: _____." Figure F6 summarizes the answers to this question.

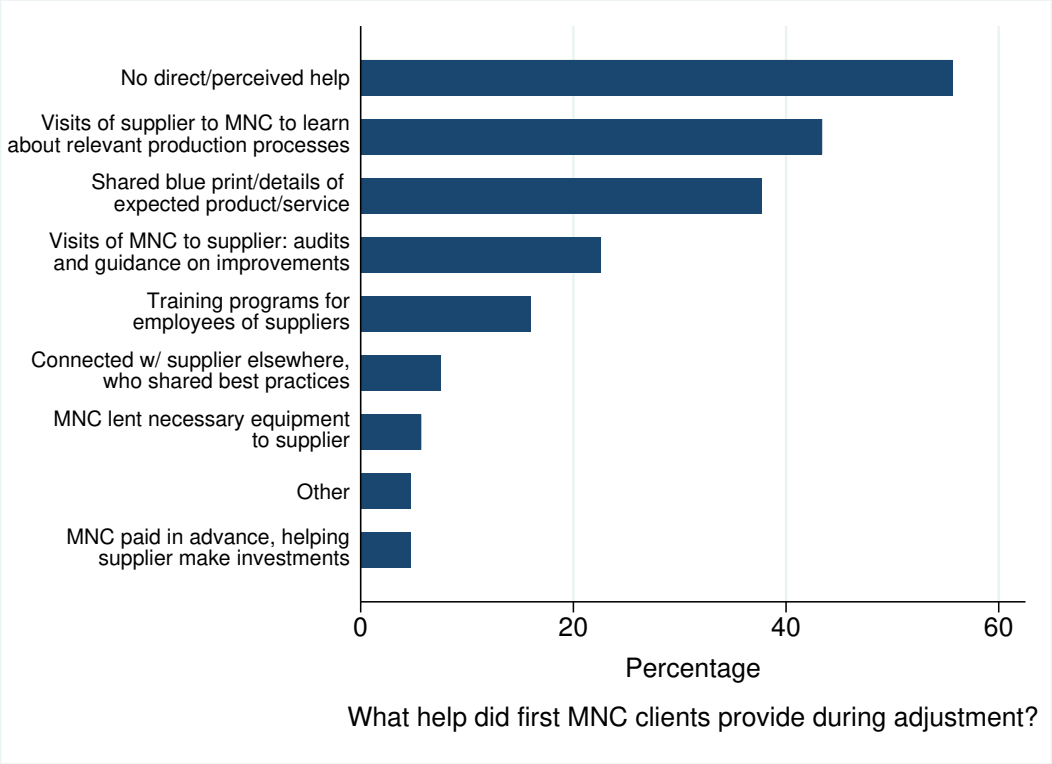


Figure F6: Question 11: How did the first MNC buyers help the firm to undergo these changes?

Notes: This graph summarizes the answers of 106 domestic firms to the survey question "How did the first multinational buyers help the firm to undergo these changes? Mark all the answers that are TRUE." Note that percentages do not need to sum up to 100 across options.

Question 12: "From the previous answers, please provide more details about the most important assistance provided by the first multinational buyers." Question type: Open-ended. Survey section: "Possible help from the multinational." Survey versions: long and short (N=106).

In the open-ended field, suppliers explained the nature of their interactions with their first MNC buyers and the extent to which these interactions are perceived as help or as integral to their deal. The main takeaway from these answers is that the adjustment period was exacting for most local suppliers. While interactions with MNCs were instrumental in understanding MNCs' expectations from both the supplier overall and the product/service provided in particular, these interactions were not always perceived as supportive/helpful. Our interpretation is that during these interactions MNCs placed high demands on their new suppliers and, while the MNC was constructive in proposing ways to improve, implementing those suggestions was still in the responsibility of the supplier. For example, the answer of one domestic form captures the subtle distinction between direct and indirect help:

> The most important help received from MNCs came in the form of audits to our plant. Another important and related support from MNCs was to give us time to address the [quality] complaints they made during these audits so that we could develop a business model incorporating their quality standards.

Question 13: "If the multinational provided direct/explicit help, how was your firm supposed to reward the multinational for this help? Please choose ONE option only." The question allowed for a single answer among seven options (in order): "The multinational did not offer any (direct/explicit) help in our adjustment to supply it, so this question does not apply," "The help offered was NOT to be rewarded, it was part of the Corporate Social Responsibility strategy of the multinational, there were no specific expectations from the multinational in exchange of that help," "The help provided was to be rewarded through lower prices than those we could offer before the collaboration with the multinational, for the same product or service (same quality)," "The help provided was to be rewarded through higher-quality products / services, at prices that did not change much," "The help provided was to be rewarded through higher-quality products / services AND ALSO through prices falling," "The help provided was to be rewarded through an exclusive contract between our firm and the multinational, we had to become its exclusive suppliers," and "Other: _____." Survey versions: long and short (N=106). Table F7 summarizes the answers to Question 13.

Table F7: Question 13: If the multinational provided direct/explicit help, how was your firm supposed to reward the multinational for this help? Please choose ONE option only

Most Important Change	Frequency	Percent
No direct/explicit help	57	53.77
Better quality of product/service, same prices	18	16.98
Better quality of product/service, falling prices	12	11.32
No need for compensation, part of MNC CSR	11	10.38
Lower prices for same product/service quality	4	3.77
Other	4	3.77
Total	N=106	100

Notes: This table summarizes the answers of 106 domestic firms to the survey question: "If the multinational provided direct/explicit help, how was your firm supposed to reward the multinational for this help? Please choose ONE option only"

Question 14: "If your firm has incurred losses from deals with MNC buyers, why does your firm have such deals with MNCs, despite this risk of losses? If your firm has never incurred losses with MNCs, you can skip the question." Question type: Open-ended. Survey section: "Possible help from the multinational." Survey version: long only (N=15). 11 of 15 respondents have provided examples of situations when they have incurred losses from deals with MNCs and their reasons behind tolerating such losses. In general, the answers reflect the stronger bargaining power of MNCs and the longer-term vision of the supplier, who is willing to accept short-term losses with the expectation that the MNC would be satisfied with its service and continue purchasing its service in the future. The supplier would learn from its initial mistakes and reduce the probability of future losses. Hereafter, we present two examples.

> When we started supplying to MNCs, at the very beginning, there was a certain margin of loss. We were expected to be very fast. In the workshop we had to make a lot of efforts. We decided

to produce more than what was initially ordered by the MNC, to have a margin in case the MNC ordered more. The extra quantities produced and not ordered became losses.

An example from another supplier:

> There is uncertainty not in the costs of a given product, but in whether the product will correspond to the expectations [of the MNC buyer]. Given the business of our firm, there is no standardized product. Hence some products might end up costing us more if more iterations are needed. The final product might look very different from what we initially thought. If we make mistakes and do not design the right product from the beginning, this can lead us to a loss. However, we see this as a learning opportunity. Sometimes one has to incur losses to learn.

Question 15: "For a purchase order of the same product, quantity and quality, is there a difference in the price charged to a national buyer with respect to a multinational buyer? Please choose ONE option from the following." The question allowed for a single answer among five options (in order): "Almost always a higher price for the multinational buyer," "More often a higher price for the multinational buyer," "In most cases, the same price for both types of buyers," "More frequently, a lower price for the multinational buyer," and "Almost always a lower price for the multinational buyer."

Survey version: only short (N=91.) There was an almost identical question in the long survey as well. However, that question was amended to specify that the order was for the same *quantity*. Suppliers explained during the interviews that for the same product and quality, MNCs are more likely to be offered lower prices as they typically place larger orders. Table F8 summarizes the choices made by the 91 domestic firms to Question 15.

Table F8: Question 15: For a purchase order of the same product, quantity and quality, is there a difference in the price charged to a national buyer with respect to a multinational buyer?

Answer	Frequency	Percent
Usually same price	53	58.24
More frequently a lower price for MNC	14	15.38
More frequently a higher price for MNC	10	10.99
Almost always a higher price for MNC	9	9.89
Almost always a lower price for MNC	5	5.49
Total	N=91	100

Notes: This table summarizes the answers of 91 domestic firms to the survey question: "For a purchase order of the same product, quantity and quality, is there a difference in the price charged to a national buyer with respect to a multinational buyer? Please choose ONE option from the following."

Table F9: Question 16: Has becoming a supplier of MNCs changed your firm's business with domestic buyers?

Choices	Freq.	Percent	Details on main reason	Freq.	Percent
No. No Impact	59	55.66			
Yes. Sold More	31	29.25			
			Better quality, same prices	15	48.39
			Higher visibility	9	29.03
			Same quality, lower prices	4	12.90
			Attractive new offer	2	6.45
			Better quality, even if higher prices	1	3.23
			Total	**N=31**	100
Yes. Sold Less	16	15.09			
			Own decision to focus on MNCs	9	56.25
			Attractive new offer, higher prices	4	25.00
			New offer not attractive, similar prices	3	18.75
			Total	**N=16**	100
Total	**N=106**	100			

Notes: This table summarizes the answers of 106 domestic firms to the survey question: "Has becoming a supplier of a multinational changed your firm's business with domestic buyers? Please choose ONE option only from the options below that best describes this impact."

Question 16: "Has becoming a supplier of a multinational changed your firm's business with domestic buyers? Please choose ONE option only from the options below that best describes this impact." The question allowed for a single answer among ten options (in order): "No. There was no impact on our domestic business, we continued to sell the same products, at the same prices, without changes in the demand of domestic buyers," "Yes, in general we DECIDED to sell LESS to domestic buyers, since we decided to focus only on multinational buyers," "Yes, in general we started selling LESS to domestic buyers, because we started producing goods or services that were not attractive to domestic buyers, despite similar prices," "Yes, in general we started selling LESS to domestic firms because, despite producing attractive goods or services, these goods or services were too expensive for domestic buyers," "Yes, in general we started selling MORE to domestic buyers, because we were selling better quality products / services, at the same price as before," "Yes, in general, we started selling MORE to domestic buyers, because we were selling products / services of the same quality, but at lower prices than before," "Yes, in general we started selling MORE to domestic buyers, because we

were selling better quality products / services EVEN IF at higher prices than before," "Yes, in general we started selling MORE to domestic buyers, because we were selling new products or services than those we offered before," "Yes, in general we started selling MORE to domestic buyers, because selling to multinationals made us more visible in the market. However, the products and prices had not really changed," and "Other: _____." Survey versions: long and short (N=106). Section: "Relationships with other types of buyers."

Table F9 reports the findings from this question. First, we group choices in three broad categories: "No. No Impact" (option 1), "Yes. Sold Less" (options two to four), and "Yes. Sold More" (options five to nine). While five firms had originally chosen the "Other: _____" option, their answers fell into an already existing option among the previous nine. These broad groups are reported in decreasing order of frequency. We then provide details on the actual choices of firms falling into either the "Yes. Sold More" or "Yes. Sold Less" categories.

Question 17: "Did becoming a supplier to a first multinational improve the ability of your firm to obtain more multinational buyers? Please choose ONE option only." Question type: Dichotomous. Options in order: "NO. Finding each new multinational buyer is as difficult as finding the first multinational buyer" or "YES. Becoming a supplier to a first multinational improved the capacity of our firm to obtain more multinational buyers." Survey versions: long and short (N=106). Section: "Relationships with other types of buyers." 83 domestic firms chose the "YES" answer (78%) and 23 domestic firms chose the "NO" answer (22%).

Table F10: Question 18: Why was it easier to find more multinational buyers after having your first (multinational) buyer? Please choose all the options that are TRUE.

Answer	Frequency	Percentage
Easier to gain MNCs' trust	71	85.5
Learned about MNCs' needs	60	72.3
Improved managerial practices	52	62.7
Expanded product/service offer	43	51.8
Improved quality without price rise	37	44.6
Improved quality with price rise	25	30.1
Lowered prices on prior products/services	5	6
Other	2	2.4

Notes: This table summarizes the answers of 83 domestic firms to the survey question: "Why was it easier to find more multinational buyers after having your first (multinational) buyer? Please choose all the options that are TRUE." Note that the frequency of answers does not need to sum up to 83 or the percentage to 100, as each firm could select all options that applied.

Question 18: "Why was it easier to find more multinational buyers after having your first (multinational) buyer? Please choose all the options that are TRUE." Question type: Multiple-

choice. Survey section: "About the multinational buyers that followed." Survey versions: long and short (N=106 surveys, but 83 answers in practice). This question was a follow-up to Question 17. If a firm selected the negative answer in Question 17, it would automatically skip this question. Hence, the following findings pertain to the 83 domestic firms choosing "YES" in Question 17. Table F10 summarizes the answers to Question 18.

Question 19: "How many of the deals of your firm with multinational buyers in CR occur through Procomer? Please choose ONE option only." The question allowed for a single answer among five options (in order): "(Almost) all deals are mediated through Procomer," "More than half of the deals are mediated by Procomer, but not all," "Less than half of the deals are mediated through Procomer, but there are still many," "Very few (or almost none) of these deals are mediated through Procomer." Survey version: long only (N=15). Survey section: "On the intermediation of deals with multinationals by Procomer." Table F11 summarizes the answers to Question 19.

Table F11: Question 19: How many of the deals of your firm with multinational buyers in CR occur through Procomer? Please choose ONE option only.

Answer	Frequency	Percentage
Very few to almost none	12	80.00
Less than half, but some	2	13.33
(Almost) all	1	6.67
Total	N=15	100

Notes: This table summarizes the answers of 15 domestic firms to the survey question: "How many of the deals of your firm with multinational buyers in CR occur through Procomer? Please choose ONE option only."

Question 20: "What are the main reasons why your firm wants to make such deals through Procomer? Please, choose (at most) the two most relevant options." The question allowed for at most two answers out of six options (in order): "Procomer deals are not different from the deals we get for ourselves, but allow us to have multiple sources of deals," "Procomer has better access to multinational buyers or the specific type of deals our firm wishes to have (for example, larger amounts, longer contracts, more high-tech buyers, etc.)," "Procomer gives us credibility in front of multinational buyers," "Procomer prepares us before each specific deal with a multinational buyer, so we feel better prepared to start deals mediated by Procomer," "Procomer accompanies our deals with multinational buyers, provides us with services even after the deal was made and is in progress," and "Other: _____." Survey version: long only (N=15). Survey section: "On the intermediation of deals with multinationals by Procomer." Table F12 summarizes the answers to Question 20.

Question 21: "Please share with us the most negative surprise or the biggest disappointment for your firm after becoming a supplier to MNCs." Question type: Open-ended. Survey

Table F12: Question 20: What are the main reasons why your firm wants to make such deals through Procomer? Please, choose (at most) the two most relevant options.

Answer	Frequency	Percentage
Procomer has better access to MNCs	9	60.0
Deals not different, just another source of deals	8	53.3
Procomer offers credibility in front of MNCs	6	40.0
Procomer helps prepare the firm before the deals	0	0.0
Procomer accompanies the firm during the deals	0	0.0
Other	2	13.3

Notes: This table summarizes the answers of 15 domestic firms to the survey question: "What are the main reasons why your firm wants to make such deals through Procomer? Please, choose (at most) the two most relevant options."

section: "Questions to wrap up." Survey version: only long (N=15).

The general message is that domestic suppliers often find themselves in asymmetric relationships with MNCs, where they feel that their efforts to make the relationship successful are not reciprocated. There is also a significant imbalance of power, size, and financial robustness between MNCs and domestic suppliers to which MNCs do not seem to be sensitive. Hereafter, we include the answers of two different suppliers that are representative of the other answers.

> One negative surprise is that MNCs do not seem to understand how impactful some of their mistakes are for their small suppliers. For instance, MNCs do not seem to be aware of how costly it is for us, as a small firm, to prepare a bid. Therefore they invite us to bid, despite having already chosen the winner. Or, sometimes, bills are misplaced, and our payment is made with delay. Even officially, MNCs have gone from 15 days of trade credit to up to 120 days. MNCs use the entire trade credit length agreed upon initially (say 120 days). Once a bill gets to accounting, it will be paid automatically 120 days after. It is true that the payment is most of the time reliable. But small suppliers like us are bearing a lot of the risks and providing financing to MNCs, as opposed to the other way around. This is surprising given how small our bills are compared to the overall turnover of these MNCs.

> We were very hopeful of positive outcomes before the first contracts. However, we had to lower prices massively to be granted those contracts. MNCs were aggressive in negotiating the reduction of prices. We still have to offer very low rates to maintain these contracts. Also, we started the deals with MNCs with one month of trade credit. Now, MNCs expect 3.5 months of credit on average. Finally, we feel that MNCs are not very interested in developing local suppliers, that they act as if they are entitled to receive high-quality goods or services at meager prices.

Question 22: "Please share with us the most positive surprise or the biggest unexpected benefit for your firm after becoming a supplier to MNCs." Question type: Open-ended. Survey section: "Questions to wrap up." Survey version: only long (N=15).

The main takeaway from these answers is that these domestic firms are now enjoying the

fruits of their initial hardships experienced upon becoming suppliers to MNCs. The following is a representative quote from one of the respondents.

> The beginnings [of relationships with MNCs] were very tough because we had to lower prices a lot. Once we adapted to the new ways of doing business, we started growing. We started buying new machines or renovating older machines, having more employees. The hardship at the beginning allowed us to rise afterward. Year after year, the contracts get renewed, so we need to continue learning and maintaining competitive prices. Whenever the costs of inputs increase, we have to improve on some other dimension to keep our prices low [better-trained machine operators, faster machines, etc.]. Also, now the MNCs have become more involved. Sometimes staff from MNCs ask: "What is slowing you down? Let us help you with that."

Online Appendix F.3.2 Survey Answers from Multinational Firms (MNCs)

Question 1: "Country where the headquarters of the multinational is." Question type: open-ended. Survey versions: long and short (N=58). Responses are summarized in Table F13.

Table F13: Question 1: MNC's Headquarters Country

HQ country	Frequency	Percentage
United States	24	41.38
Great Britain	4	6.90
Costa Rica	3	5.17
Germany	3	5.17
Netherlands	3	5.17
Panama	3	5.17
Spain	2	3.45
France	2	3.45
Japan	2	3.45
Venezuela	2	3.45
Belgium	1	1.72
Canada	1	1.72
Switzerland	1	1.72
Colombia	1	1.72
Guatemala	1	1.72
Ireland	1	1.72
Cayman Islands	1	1.72
Mexico	1	1.72
Peru	1	1.72
El Salvador	1	1.72
Total	N=58	100

Notes: This table summarizes the answers of 58 multinationals to the survey question: "Country where the headquarters of the multinational is."

Question 2: "Your position (job title) in the multinational." Question type: open-ended. Survey versions: long and short (N=58). Responses are summarized in Table F14.

Table F14: Summary of Job Titles for Respondents to the Survey to Multinationals

Position (Standardized)	Frequency	Percentage
Supply Chain/Procurement/Operations Manager	22	37.93
General Manager CR Operation / Country Manager	18	31.03
Other Unit Manager	14	24.14
Supply Chain/Procurement Specialist	4	6.90
Total	N=58	100

Notes: This table summarizes the answers of 58 respondents (to the survey to multinationals) to the survey question: "Your position (job title) in the multinational." We have grouped job titles under four categories. Under "Supply Chain/Procurement/Operations Manager," one can find job titles such as Purchasing Manager ("Gerente de Compras"), Global Operations Manager ("Gerente Global de Operaciones"), or Purchasing and Logistics Manager ("Gerente de Compras y Logistica"). Under "General Manager CR Operation / Country Manager," one can find job titles such as Plant Manager ("Gerente de Planta"), Manager of XX Costa Rica ("Gerente de XX Costa Rica") or Site Supervisor. Under "Other Unit Manager," one can find job titles such as Manager of Public Relations ("Gerente Asuntos Públicos"), Manager of Government Affairs ("Gerente de Asuntos Gubernamentales"), or Finance Manager ("Gerente Financiero"). Under "Supply Chain/Procurement Specialist," one can find job titles such as Buyer ("Encargado de Compras") or Import/Export Analyst ("Analista Import / Export").

Question 3: "To your knowledge, how important were the following factors in the decision of the multinational to locate itself in CR? Complete all the options, choosing how important you think each criterion was. Note: There is a separate question about the decision to stay and / or expand in CR." Question type: Likert-type scale. Survey versions: long and short (N=58). Section: "General questions about the multinational's incentives to invest in CR."

For each proposed factor, the respondent had to choose one of four options: "Very important/Crucial," "Important," "An advantage, but not that important," or "Not important, does not apply." We proposed eight potential reasons (in order): "The distance between CR and the HQ country," "The distance between CR and your target markets," "The Costa Rican market itself," "The level of education of the labor force," "Relatively low wages for the type of employees needed by the multinational," "Tax conditions such as the Free Zone regime," "The availability of suppliers at the prices and / or quality that the multinational needs," "The natural resources (for example, minerals) of CR, necessary for the production of the multinational." Figure F7 summarizes the findings from Question 3.

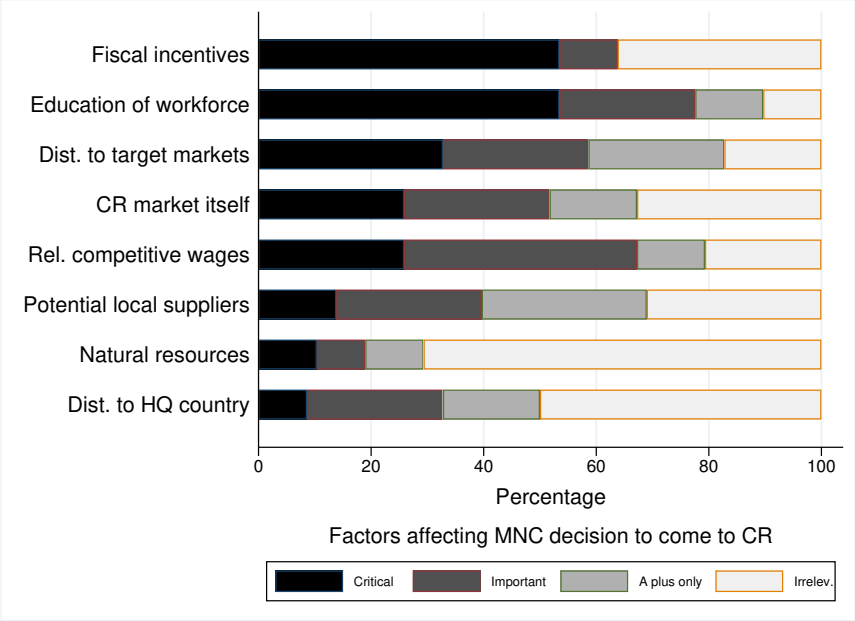


Figure F7: Question 3: How Important Were the Following Factors in the Decision of the Multinational to Locate Itself in CR?

Notes: This graph summarizes the answers of 58 multinationals to the survey question "To your knowledge, how important were the following factors in the decision of the multinational to locate itself in CR? Complete all the options, choosing how important you think each criterion was." Percentages do not need to sum up to 100 across options, as each respondent had to rate the extent to which each criterion had been relevant to the MNC. Percentages only need to sum up to 100 for each criterion.

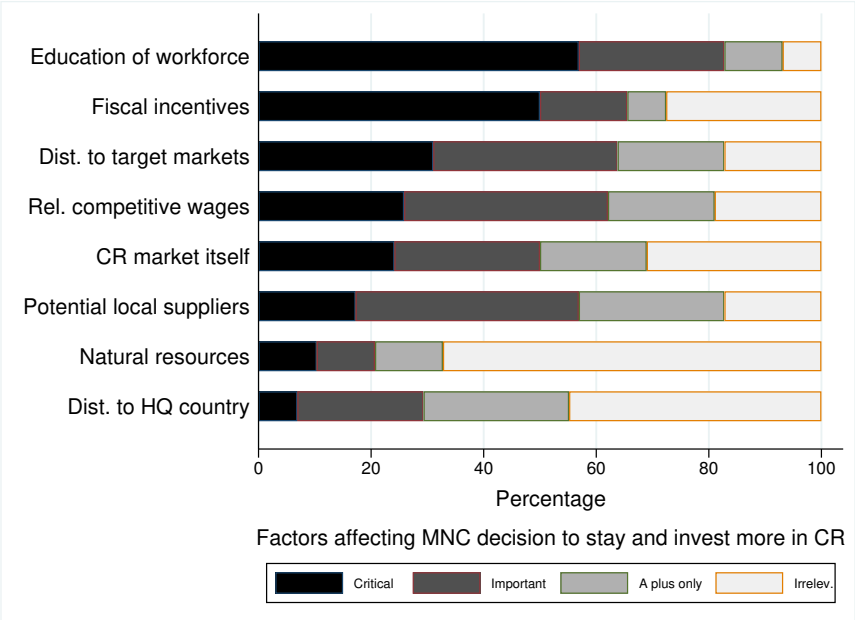


Figure F8: Question 4: To your knowledge, how important were the following factors in the decision of the multinational to STAY or EXPAND in CR?

Notes: This graph summarizes the answers of 58 multinationals to the survey question "To your knowledge, how important were the following factors in the decision of the multinational to STAY or EXPAND in CR? Complete all the options and choose how important you think each criterion was." Percentages do not need to sum up to 100 across options, as each respondent had to rate the extent to which each criterion had been relevant to the MNC. Percentages only need to sum up to 100 for each criterion.

Question 4: "To your knowledge, how important were the following factors in the decision of the multinational to STAY or EXPAND in CR? Complete all the options and choose how important you think each criterion was." Question type: Likert-type scale. Survey versions: long and short (N=58). Section: "General questions about the multinational's incentives to invest in CR." The scale and the options were the same as those proposed for Question 3. Figure F8 summarizes the findings from Question 4.

Table F15: Question 5: In general, how important are the following criteria when choosing a new supplier in CR (Costa Rican or not)?

Criterion	Critical	V. Important	Important	Only useful	Irrelevant
Quality of products/services	74.1	17.2	6.9	0.0	1.7
Will or ability to adapt to MNCs	58.6	27.6	10.3	1.7	1.7
Price of products/services	43.1	32.8	15.5	6.9	1.7
Reliability, traceability etc.	32.8	36.2	19.0	6.9	5.2
ISO certificates	22.4	48.3	15.5	5.2	8.6
Productive capacity	13.8	29.3	34.5	10.3	12.1
Will or ability to invest	10.3	32.8	25.9	13.8	17.2
Distance supplier-MNC	6.9	25.9	20.7	25.9	20.7
Prior experience exporting	6.9	19.0	15.5	25.9	32.8
Foreign language	5.2	20.7	17.2	19	37.9
Prior experience w/ MNCs	3.4	36.2	25.9	19	15.5
Same HQ country	3.4	1.7	5.2	19.0	70.7
Be part of a FTZ	3.4	3.4	13.8	22.4	56.9
Will to move closer	1.7	19.0	19.0	36.2	24.1
Being foreign-owned	0.0	0.0	1.7	15.5	82.8

Notes: This table summarizes the answers of 58 multinationals to the survey question "In general, how important are the following criteria when choosing a new supplier in CR (Costa Rican or not)? Complete all the options, selecting the importance that you think each criterion has." Percentages do not need to sum up to 100 across criteria, as each respondent had to rate the extent to which each criterion is relevant to the MNC. Percentages only need to sum up to 100 for each criterion.

Question 5: "In general, how important are the following criteria when choosing a new supplier in CR (Costa Rican or not)? Complete all the options, selecting the importance that you think each criterion has." Section: "Relations with local suppliers (located in CR). From this moment, our questions will focus on the relationship between the multinational and its local suppliers."

For each proposed factor, the respondent had to choose one of five options: "Of critical importance," "Very important," "Important," "Useful, but not a decisive factor," or "Without importance, irrelevant, does not apply." We proposed fifteen potential reasons (in order): "The physical distance between the supplier and the multinational," "The willingness of the supplier to move closer to the multinational," "Having previous experience with multinationals," "Having previous experience exporting," "Being from the same country as the multinational," "Being foreign-owned, even if not from the same country as the multinational," "Being under

the Free Trade Zone regime," "The price of goods or services already on offer," "The quality of goods or services already on offer," "Willingness or ability to adapt and supply the exact product or service needed by the multinational," "Having a manager (or employee) who speaks the main language of the multinational," "Reliability / inventory management / input traceability / other characteristics of the organization," "Having standardized quality certificates, relevant to the business (for example, ISO-13485 in the medical device sector)," "The size of the supplier, that is, that already has sufficient productive capacity," "The willingness or ability to make large investments to supply to the multinational." Table F15 summarizes the answers to Question 5.

Question 6: "Does the multinational provide any particular support or guidance to a new supplier to improve its ability to supply to the multinational?" Question type: Dichotomous. Survey version: both short and long (N=15). Question type: Dichotomous. The two options available were "NO, the multinational does not provide any explicit support" and "YES, the multinational carries out specific actions to help the new supplier adapt to their relationship."

40 multinationals answered "YES" (69%) and 18 multinationals answered "NO" (31%).

Table F16: Question 7: Which of the following options describe the way(s) in which the multinational provides support to the new supplier to adapt to their new relationship?

Support	Frequency	Percentage
Share blueprint/details of expected product/service	33	82.5
Visits of supplier to MNC, learn about relevant production process	33	82.5
Visits of MNC to supplier, audits and guidance on improvements	32	80.0
Training programs for suppliers' workers	13	32.5
Connect w/ supplier elsewhere, who shares best practices	9	22.5
MNC pays in advance, helping supplier make investments	6	15.0
MNC lends necessary equipment to supplier	2	5.0
Other	5	12.5

Notes: This table summarizes the answers of 40 respondents (to the survey to multinationals) to the survey question: "Which of the following options describe the way(s) in which the multinational provides support to the new supplier to adapt to their new relationship? Mark all the answers that are TRUE." Note that the 18 multinationals that responded "NO" to Question 6 skipped this question.

Question 7: "Which of the following options describe the way(s) in which the multinational provides support to the new supplier to adapt to their new relationship? Mark all the answers that are TRUE." Question type: Multiple-choice. Survey section: "More details on the support provided by the multinational to suppliers." Survey versions: long and short (N=40).

We proposed eight potential options (in order): "The multinational provides an instruction manual ("blueprint") of the desired product or service or other relevant documentation," "Employees of the multinational visit the supplier and help it with advice in the adjustment

process (for example, the multinational performs supplier audits and guides the supplier on ways to improve)," "Employees of the supplier are invited to visit the multinational to observe parts of its production that are relevant to the inputs they will supply to the multinational," "The multinational has standardized training programs that the multinational offers to employees of local suppliers," "The multinational puts the supplier in contact with another supplier that sells similar products or services to the multinational in other places, to advise the new supplier on best practices," "The multinational lends money or pays the firm in advance so that the firm can make the necessary investments," "The multinational is the one that buys the specific machinery necessary to provide the good / service and lends / rents it to the local supplier," or "Other: _____." Table F16 summarizes the answers of 40 multinationals to Question 7.

Question 8: "If possible, please provide more details on the most important way in which the multinational assists the supplier to adjust to its new relationship with the multinational. For example, the duration of the assistance provided, the frequency of the assistance, the number of trained employees, the size of the loan offered and the conditions, etc." Question type: Open-ended. Survey section: "More details on the support provided by the multinational to suppliers." Survey version: long and short (N=40). This question was a follow-up to Question 7, for those having chosen "YES" in Question 6.

Each MNC responding positively to Question 6 provided details on its most important form of support extended to its new suppliers. The main takeaway is that there is great variety in the breadth and depth of the support provided by MNCs to their new suppliers. The lighter forms of assistance include sharing of detailed descriptions of the good or service expected (without additional guidance on how to actually produce it) or sharing of an instruction manual on the general practices that MNCs expect their suppliers to follow. The following quote pertains to one of the MNCs whose support seemed more substantial.

> The most important help that we offer comes in the form of standardized training programs. Given that our industry has very high standards of quality, we need to make sure that our suppliers can live up to the same standards as we do. For that reason, our local experts provide tailored training to suppliers, share corporate best practices with them. This leads to a win-win: it benefits us as it turns the supplier into an ally, it benefits the supplier as it is improving its [business and technical] practices. Whether the training is offered only to the manager of the supplier or whether it includes other employees as well depends on the nature of the training, how deep it goes into the processes of the supplier, how large is the gap between where the supplier is and where it needs to get.

Question 9: "How is the supplier expected to compensate the multinational for the support received? Please choose ONE option only." Survey section: "More details on the support provided by the multinational to suppliers." Survey version: long and short (N=40).

The question allowed for a single answer among seven options (in order): "The support provided is NOT intended to be reciprocated. For example, this support is part of the Corporate Social Responsibility strategy of the multinational," "The support must be corresponded through lower prices in the SHORT-TERM than the prices that the firm could offer before the collaboration with the multinational, for the same product or service," "The support must be

corresponded through a trend of GRADUALLY decreasing prices compared to the prices that the firm could offer before the collaboration with the multinational, but for the same product or service," "The support must be corresponded through ensuring a higher quality of the product / service, BUT with prices that do not change much," "The support must be corresponded through ensuring a greater quality of the product / service AND with prices also falling," "The support must be reciprocated through an exclusivity contract between the firm and the multinational, the firm must become an exclusive supplier," or "Other: _____."

Table F17 summarizes the answers of 40 multinationals to Question 9.

Table F17: Question 9: How is the supplier expected to compensate the multinational for the support received? Please choose ONE option only.

Compensation	Frequency	Percentage
Increasing quality, prices not changing much	15	37.5
Increasing quality, falling prices	12	30.0
Not to be compensated, part of CSR	8	20.0
Other	3	7.5
Exclusivity contract b/n MNC and supplier	1	2.5
Quickly falling prices, same product/service	1	2.5
Total	N=40	100

Notes: This table summarizes the answers of 40 respondents (to the survey to multinationals) to the survey question:"How is the supplier expected to compensate the multinational for the support received? Please choose ONE option only." Note that the 18 multinationals that responded "NO" to Question 6 skipped this question.

Question 10: "Please, if possible, provide more details about the previous answer." This question is a follow-up to the question above. Survey section: "More details on the support provided by the multinational to suppliers." Survey version: long only (N=23).

By and large, MNC staff describe the support provided to the suppliers of the MNC as meant to establish a win-win collaboration. The following answer from the Supply Chain Manager of one MNC is representative for all other 22 answers.

> While there is no formal commitment during the period of support, we expect that the supplier is willing to educate itself, to learn how to improve the quality and service offered. Moreover, we help the supplier improve its processes, its management practices. Hence there is the expectation that cost reductions would be shared between the supplier and us, that the help we provided led to a win-win situation. For instance, we excel in lean manufacturing and invite suppliers to see how we manage our operation, so that they can apply the same principles to their operation. Suppliers are under constant control of their quality and service. If we put suppliers under probation and if their quality/service does not improve within a couple of months, they lose the contract with us.

Questions 11, 12, and 13: We summarize here the answers to three consecutive and related questions: "From your point of view, what are the three most probable prof-

its/benefits/advantages that Costa Rican firms experience when they become suppliers of MNCs? Provide details to your answers." All three answers were open-ended. Survey version: long only (N=23). In Table F18 we categorized the answers provided by the 23 respondents into four categories, which we created based on the common themes emerging across answers.

Table F18: Questions 11, 12, and 13: Top three most important benefits to becoming a supplier to MNCs, according to MNCs

Most important benefit		Second most important benefit		Third most important benefit	
9	Stability and predictability	11	Learning opportunities	12	Learning opportunities
7	Learning opportunities	7	Stability and predictability	5	Scale and global opportunities
6	Scale and global opportunities	4	Scale and global opportunities	2	Stability and predictability
1	Reputation	1	Reputation	1	Reputation
0	None	0	None	3	None
N=23		N=23		N=20	

Hereafter, we provide an example of an answer for each of the four categories. Each answer comes from a different respondent.

Example for "stability and predictability":

> The first most important gain/benefit /advantage for Costa Rican firms is the contract length. The type of business they establish is a win-win relationship, where it is possible for suppliers to project themselves into the future and begin to be part of a stable supply chain.

Example for "learning opportunities":

> The third largest gain/benefit/advantage derived from becoming a supplier to MNCs has to do with the improvements and the strengthening of the management model of the supplier, both concerning production and service provision. The modus operandi a supplier learns during the collaboration with MNCs is helpful in several ways. If the supplier manages to standardize processes and apply the same principles for other clients, the supplier will always win because it is better prepared. This gain is particularly significant for SMEs.

Example for "scale and global opportunities":

> Once a firm joins our list of approved suppliers for a given commodity, opportunities are global for that supplier within the organization. [They] are in the system and visible globally. That supplier becomes available to anyone at any site. As long as the pricing is correct and the business proposition is the right one, then they can supply elsewhere as well.

Example for "reputation":

> The second largest gain goes to the reputation of the supplier. Once one MNC uses a supplier, given the high expectations of MNCs, if that initial deal goes well, the news spreads to other MNCs that have similar requirements.

Questions 14, 15, and 16: We summarize here the answers to three consecutive and related questions: "From your point of view, what are the three losses/risks/disadvantages

that Costa Rican companies experience when they become suppliers of MNCs? Provide details to your answers." All three answers were open-ended. Survey version: long only (N=23).

In Table F19 we categorized the answers provided by the 23 respondents into six categories, which we created based on the common themes emerging across answers.

Table F19: Questions 14, 15, and 16: Top three most important risks to becoming a supplier to MNCs, according to MNCs

Most important risk		Second most important risk		Third most important risk	
11	Financial or legal risk	7	None	18	None
7	Demanding changes	5	Demanding changes	2	Financial or legal risk
3	None	4	Financial or legal risk	1	Bad reputation
1	Bad reputation	4	Bad reputation	1	Demanding changes
1	Specificity	2	Other	1	Other
0	Other	1	Specificity	0	Specificity
N=23		N=23		N=23	

Hereafter, we provide an example of an answer for the categories "financial or legal risk," "demanding changes," "bad reputation," and "specificity." Each answer comes from a different respondent.

Example for "financial or legal risk":

> A first considerable risk comes from the volumes ordered by MNCs. The supplier might need to invest a lot to live up to its large orders. However, if the supplier is unable to deliver the expected level of quality and service, it might lose the contract and get in trouble because of the investment made. It is not the policy of the multinational to sign long-term contracts with a supplier because they cannot commit to continuing a contract with a supplier that does not deliver what it is supposed to deliver time and again.

Example for "demanding changes":

> The most significant disadvantage/risk has to do with the level of pressure that a firm is put under when becoming a supplier to an MNC. Supplying to an MNC comes with many requirements, many specifications, high standards. MNCs are very demanding. This can be very stressful for a small Costa Rican firm. Sometimes some misunderstandings come up due to misaligned expectations.

Example for "bad reputation":

> The second most important risk is reputational. MNCs participate at seminars, at fora. They exchange on their experience with local suppliers. If a given relationship with an MNC goes sour, then this will become quickly known to other MNCs as well. For this reason, every commercial relationship matters for the reputation of a supplier, not to gain a reputation of being a bad supplier, from which it is hard to recover.

Example for "specificity":

Given the market in which the MNC is, suppliers of direct inputs might feel too narrowly specialized.

Questions 17 and 18: We bundle together these two questions. Question 17 asked about the procurement decision process on key inputs, Question 18 about the decision process on secondary inputs. "WHICH AFFILIATE decides on the procurement of KEY (or SECONDARY) INPUTS for the affiliate in CR and HOW? Please choose ONE option only. Note: Key inputs are those inputs that affect the quality and final characteristics of the core product. An example of a good / service that may **not** be key (may be secondary) is packaging or spare parts for the machinery used in production."

The question allowed for a single answer among six options (in order): "Most decisions about key (secondary) inputs are made by the headquarters (or another affiliate other than the affiliate in CR), with little to no feedback on Costa Rican suppliers from the Costa Rican affiliate," "Most of the decisions on key (secondary) inputs are made by the headquarters (or another affiliate other than the affiliate in CR), but with comments on Costa Rican suppliers from the Costa Rican affiliate," "Decisions on key (secondary) inputs are made jointly between the headquarters (or another affiliate other than the affiliate in CR) and the Costa Rican subsidiary," "Most decisions on key (secondary) inputs are made by the Costa Rican affiliate, but with comments from the headquarters (or another affiliate other than the affiliate in CR)," "Most decisions on key (secondary) inputs are made by the Costa Rican affiliate, with little to no feedback from the headquarters (or any affiliate other than the affiliate in CR)," or "Other: _____." Table F20 summarizes the answers from both Questions 17 and 18.

Table F20: Questions 17 and 18: WHICH AFFILIATE decides on the procurement of KEY (SECONDARY) INPUTS for the affiliate in CR and HOW? Please choose ONE option only.

	Core inputs		**Secondary inputs**	
	Frequency	Percent	Frequency	Percent
HQ, little local feedback	7	12.1	0	0.0
HQ, with local feedback	12	20.7	3	5.2
Joint decision	15	25.9	10	17.2
Local, with HQ feedback	8	13.8	14	24.1
Local, little HQ feedback	12	20.7	28	48.3
Other	4	6.9	3	5.2
Total	N=58	100	N=58	100

Notes: This table summarizes the answers of 58 respondents (to the survey to multinationals) to the survey questions: "WHICH AFFILIATE decides on the procurement of KEY (SECONDARY) INPUTS for the affiliate in CR and HOW? Please choose ONE option only."

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