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

Alonso Alfaro-Ureña, Isabela Manelici, and Jose Vasquez

Appendices for Online Publication

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

- Online Appendix A includes additional pieces of evidence, some to further motivate our research setup, others bringing more insights on the wide-ranging effects of becoming a supplier to MNCs.

- Online Appendix B contains supplemental robustness checks on the main event-study methodology implemented on the economy-wide (full and restricted) samples of first-time suppliers to MNCs. It also brings evidence that our results are not driven by changes in the third-party reporting behavior of first-time suppliers to MNCs.

- Online Appendix C provides detailed derivations of the main equations and results of the model introduced in Section 5.

- Online Appendix D presents several pieces of evidence assessing the robustness of our baseline model-based findings. First we present additional evidence motivating our IV strategy to estimate δ and the resulting IV estimates. Then, we investigate the sensitivity of our model-based findings to different values of the two main parameters of the model (δ and σ). Last, we discuss the implications of one of the assumptions made to separate intensive and extensive margin effects.

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

- Online Appendix F presents in detail our administrative data and Procomer "Productive Linkages" data and, in particular, the sample construction rules for each data source. The subsection on "Productive Linkages" also provides context on the program itself.

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

Online Appendix A Additional Evidence

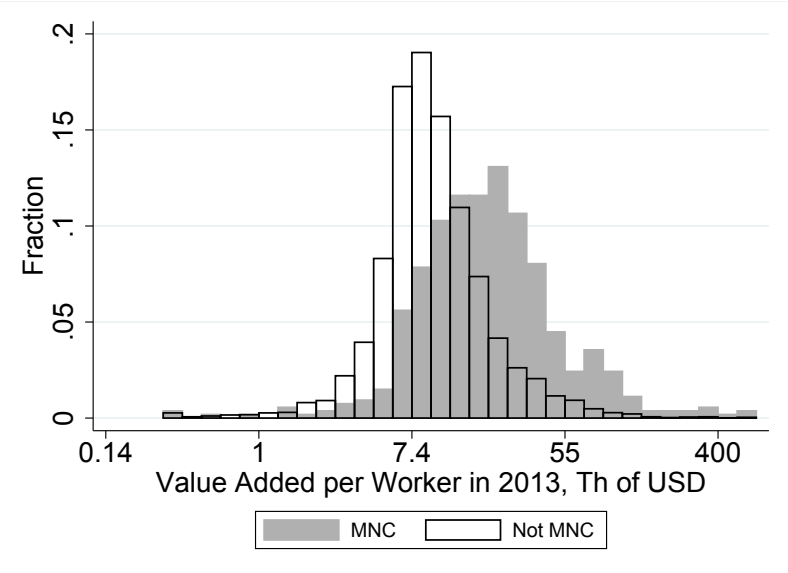


Figure A1: Distributions of Value Adder Per Worker for MNCs vs Non-MNCs in Costa Rica

Notes: Figure A1 plots two histograms of the value added per worker (in 2013, in thousands of U.S. dollars) for two types of firms in Costa Rica: all MNC affiliates and all firms that are not MNC affiliates. Both histograms contain only firms that hire more than 10 workers that year.

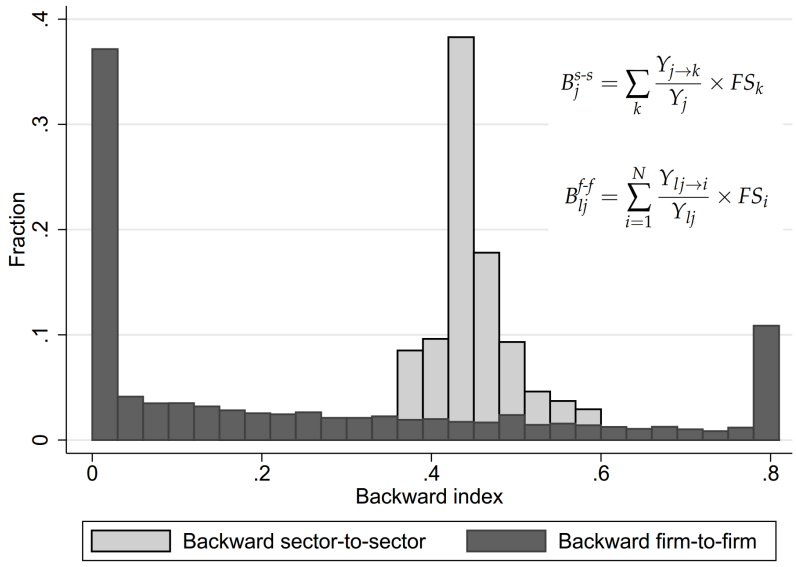


Figure A2: Histograms of Two Firm-level Measures of Backward Linkages

Notes: Figure A2 plots two measures of firm-level backward linkages. Firms are not weighted by their size; histograms are based on firm counts. The "Backward sector-to-sector" measure is the typical one used in the FDI spillovers literature; all firms in a given sector j are assigned the same value of the backward linkage measure, depending on the extent to which the sector j of the firm sells to a given sector k (from I-O table coefficients) and the share of foreign ownership in those sectors, FS_k (overall foreign share of sector k). "Backward firm-to-firm" uses the actual firm-to-firm transaction data, and in particular the exact amounts sold by firm l to buyer firm i and the actual share of foreign ownership of buyer i (FS_i). All linkage values above 0.8 are binned up at 0.8. When we run a regression over the entire sample of firms in Costa Rica of the firm-level "Backward firm-to-firm" measure on their sector-level "Backward sector-to-sector" measure, we obtain an R^2 of less than 1%.

Table A1: Domestic Firms Improve Their Performance after Starting to Supply MNCs

	VA (1)	Profits (2)	VA/L (3)	Profits/L (4)	Sales/L (5)	VA (6)	Profits (7)	VA/L (8)	Profits/L (9)	Sales/L (10)
4 years before event	0.010	-0.088*	0.022	-0.025	0.036*	-0.097	-0.205***	-0.016	0.000	0.033
	(0.038)	(0.052)	(0.024)	(0.042)	(0.020)	(0.066)	(0.071)	(0.040)	(0.062)	(0.027)
3 years before event	-0.001	0.001	0.004	0.037	0.032*	-0.060	-0.070	-0.029	0.054	0.028
	(0.031)	(0.037)	(0.023)	(0.031)	(0.018)	(0.042)	(0.047)	(0.030)	(0.039)	(0.022)
2 years before event	0.021	-0.029	0.016	-0.001	0.021	-0.021	-0.065**	-0.006	0.012	0.016
	(0.022)	(0.021)	(0.020)	(0.022)	(0.015)	(0.031)	(0.027)	(0.026)	(0.029)	(0.015)
Year of event	0.058***	0.058**	0.037**	0.084***	0.096***	0.109***	0.095***	0.061***	0.056**	0.103***
	(0.020)	(0.026)	(0.017)	(0.024)	(0.012)	(0.022)	(0.028)	(0.021)	(0.027)	(0.016)
1 year after event	0.215***	0.216***	0.011	0.096***	0.084***	0.307***	0.299***	0.056**	0.061*	0.091***
	(0.031)	(0.029)	(0.017)	(0.025)	(0.012)	(0.034)	(0.041)	(0.026)	(0.034)	(0.019)
2 years after event	0.261***	0.241***	0.020	0.108***	0.079***	0.365***	0.337***	0.071**	0.047	0.091***
	(0.035)	(0.030)	(0.019)	(0.032)	(0.012)	(0.050)	(0.054)	(0.031)	(0.042)	(0.026)
3 years after event	0.260***	0.230***	0.017	0.105***	0.070***	0.383***	0.355***	0.088**	0.026	0.076**
	(0.045)	(0.038)	(0.025)	(0.030)	(0.013)	(0.064)	(0.073)	(0.038)	(0.048)	(0.033)
4 years after event	0.254***	0.220***	0.025	0.090***	0.078***	0.393***	0.371***	0.110**	-0.011	0.087**
	(0.044)	(0.045)	(0.024)	(0.032)	(0.014)	(0.083)	(0.084)	(0.054)	(0.056)	(0.041)
Mean Dep. Var. (level)	0.18	0.26	0.017	0.024	0.081	0.22	0.45	0.015	0.031	0.10
SD Dep. Var. (level)	0.55	0.77	0.040	0.042	0.18	0.63	1.27	0.043	0.062	0.31
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
Never Suppliers	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Adjusted R^2	0.71	0.71	0.67	0.60	0.78	0.71	0.74	0.52	0.61	0.80
# Observations	110,857	110,857	110,857	110,857	116,683	23,130	23,130	23,130	23,130	23,961
# Fixed Effects	24,591	24,591	24,591	24,591	25,174	7,252	7,252	7,252	7,252	7,366
# Firms	17,552	17,552	17,552	17,552	18,035	3,447	3,447	3,447	3,447	3,482

Notes: Table A1 shows the results of running the event-study specification (1) adapted to five dependent variables: log value added, log profits, log value added per worker, log profits per worker, and log sales per worker. The event is 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. These regressions do not include firm-level time-varying controls, x_{it}, but only firm and 4-digit sector $\times$ province $\times$ calendar year fixed effects. Columns (1)-(5) 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 an MNC during our entire firm-to-firm transaction dataset. Clustering of standard errors is at the 2-digit sector by province level. Columns (6)-(10) focus only on the restricted 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. 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 A2: Domestic Firms (Weakly) Reduce their Mark-ups after Starting to Supply MNCs

Outcome: Mark-up	(1)	(2)
4 years before event	0.007	0.063*
	(0.032)	(0.036)
3 years before event	-0.007	0.027
	(0.017)	(0.026)
2 years before event	0.002	0.022
	(0.009)	(0.015)
Year of event	-0.008	-0.031*
	(0.015)	(0.017)
1 year after event	-0.018	-0.062**
	(0.012)	(0.024)
2 years after event	-0.022	-0.087***
	(0.015)	(0.029)
3 years after event	-0.029	-0.118***
	(0.020)	(0.034)
4 years after event	-0.034*	-0.143***
	(0.017)	(0.043)
Mean Dep. Var. (level)	1.25	1.26
SD Dep. Var. (level)	0.52	0.52
Firm FE	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes
Never Suppliers	Yes	No
Adjusted R^2	0.80	0.78
# Observations	50,062	10,803
# Fixed Effects	12,796	4,020
# Firms	8,658	1,868

Notes: Table A2 shows the results of running the event-study specification (1) using firm-level mark-ups as the dependent variable. Mark-ups are estimated using the methodology of De Loecker and Warzynski (2012) for a value-added Cobb-Douglas production function. The event is 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. Column (1) reports 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 an MNC during our entire firm-to-firm transaction data. Clustering of standard errors is at the 2-digit sector by province level. Column (2) focuses only on the sample of domestic firms becoming first-time suppliers to an MNC after 2010 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.

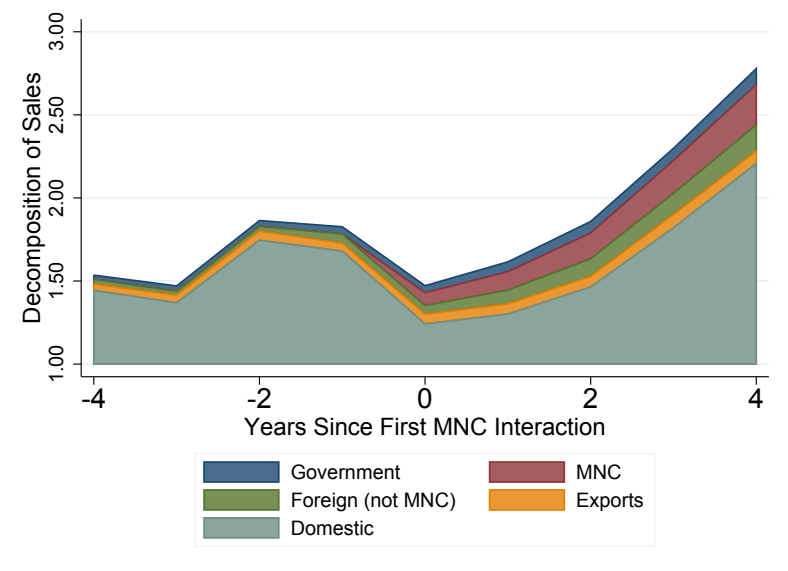


Figure A3: Decomposition of Sales for First-time Suppliers to MNCs

Notes: Figure A3 plots a decomposition of the 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. These averages are not demeaned through any fixed effect.

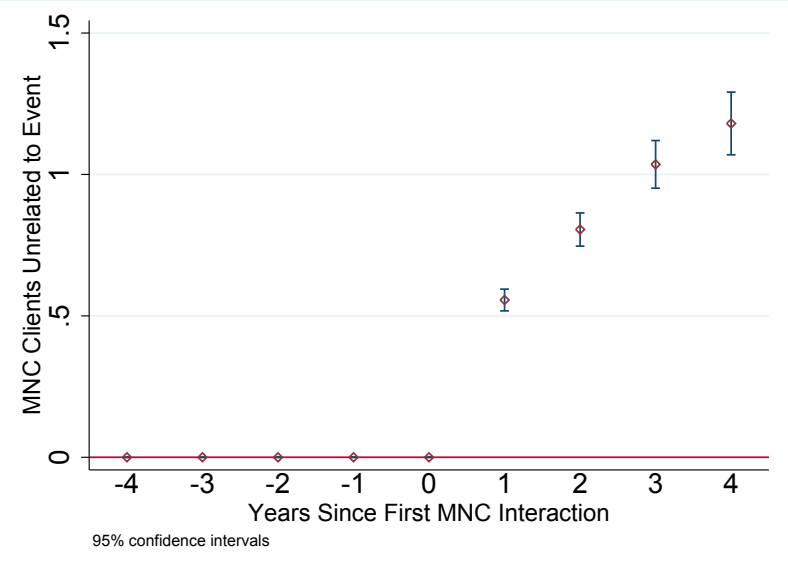


Figure A4: Average Number of MNC Buyers, Other Than First MNC Buyer

Notes: Figure A4 plots the average (across first-time suppliers to MNCs) number of MNC buyers in a given event year that are *different* from the initial MNC buyer triggering the event for each supplier. The horizontal axis refers to event years and the vertical axis to the average number of (other) MNC buyers. The vertical lines reflect the 95% confidence intervals. By construction, all averages for event years *-4* to *0* are zero.

Table A3: After Starting to Supply MNCs, Sales to Non-Corporate Buyers Increase, but Their Share in Overall Sales to Others Falls

	Sales to Others Non-Corp (1)	Sh. of Other Sales Non-Corp (2)	Sales to Others Non-Corp (3)	Sh. of Other Sales Non-Corp (4)
4 years before event	-0.005	-0.015	-0.146	-0.019
	(0.049)	(0.009)	(0.094)	(0.023)
3 years before event	-0.034	-0.020**	-0.065	-0.017
	(0.047)	(0.008)	(0.067)	(0.012)
2 years before event	-0.022	-0.013	-0.035	-0.006
	(0.037)	(0.009)	(0.039)	(0.010)
Year of event	-0.086**	-0.050***	-0.031	-0.051***
	(0.041)	(0.009)	(0.042)	(0.010)
1 year after event	0.129***	-0.073***	0.203***	-0.069***
	(0.039)	(0.012)	(0.056)	(0.013)
2 years after event	0.144***	-0.072***	0.254***	-0.062***
	(0.047)	(0.012)	(0.079)	(0.018)
3 years after event	0.101*	-0.075***	0.211*	-0.061**
	(0.060)	(0.012)	(0.106)	(0.023)
4 years after event	0.164***	-0.071***	0.317**	-0.051*
	(0.045)	(0.011)	(0.130)	(0.028)
Mean Dep. Var. (level)	0.68	0.74	1.01	0.55
SD Dep. Var. (level)	2.17	0.36	3.72	0.36
Firm FE	Yes	Yes	Yes	Yes
Year-4DSect-Prov FE	Yes	Yes	Yes	Yes
Never Suppliers	Yes	Yes	No	No
Adjusted R^2	0.70	0.74	0.71	0.63
# Observations	108,844	116,683	21,448	23,961
# Fixed Effects	24,420	25,174	6,991	7,366
# Firms	17,565	18,035	3,364	3,482

Notes: Table A3 shows the results of running the event-study specification (1) adapted to two dependent variables: log total sales to all non-corporate buyers and the share of sales to non-corporate buyers out of all sales to others. The total sales to all non-corporate buyers are constructed starting from total sales in a given year (from corporate income tax returns data), from which we subtract all sales to (corporate) buyers (including the MNC triggering the event, from firm-to-firm transaction data). Total sales to all non-corporate buyers include all those sales to end consumers (general public) and firms that do not amount to 4,200 U.S. dollars in a given year. The share of non-corporate sales out of all sales to others is meant to capture potential reallocations of sales to others (sales excluding the MNC triggering the event) among buyers of different types. The event is 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. These regressions do not include firm-level time-varying controls, x_{it}, only the fixed effects reported in each column. Robust standard errors in parentheses. Means (in levels) for columns (1) and (3) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A4: Domestic Firms See Their Transactions Increase after Starting to Supply MNCs

Outcome: (log) Value of Transaction	(1)	(2)	(3)	(4)
4 years before event	0.007	0.007	0.003	-0.039*
	(0.018)	(0.015)	(0.015)	(0.020)
3 years before event	-0.003	0.011	0.011	-0.014
	(0.013)	(0.011)	(0.011)	(0.014)
2 years before event	0.002	0.009	0.009	0.004
	(0.009)	(0.007)	(0.007)	(0.010)
Year of event	-0.002	0.016**	0.018***	0.017*
	(0.009)	(0.007)	(0.007)	(0.009)
1 year after event	0.018	0.038***	0.040***	0.051***
	(0.012)	(0.010)	(0.010)	(0.013)
2 years after event	0.022	0.039***	0.039***	0.055***
	(0.015)	(0.013)	(0.013)	(0.017)
3 years after event	0.027	0.044***	0.047***	0.085***
	(0.020)	(0.016)	(0.017)	(0.022)
4 years after event	0.043*	0.046**	0.047**	0.089***
	(0.024)	(0.020)	(0.020)	(0.027)
Mean Dep. Var. (level)	0.031	0.036	0.036	0.035
SD Dep. Var. (level)	0.071	0.078	0.078	0.078
Supplier FE	Yes	No	No	No
Supplier-Buyer FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	No	No
Year-Prov FE	No	No	Yes	No
Year-4DSect-Prov FE	No	No	No	Yes
Adjusted R^2	0.20	0.71	0.71	0.72
# Observations	412,420	305,005	305,005	304,400
# Fixed Effects	3,537	83,338	83,398	88,708
# Suppliers	3,527	3,382	3,382	3,341
# Buyers	99,111	44,951	44,951	44,917

Notes: Table A4 shows the results of running the event-study specification (1) adapted to one dependent variable: log value of the transaction made by a given supplier - buyer pair, in a given year. The unit of observation is at the seller-buyer-year level. The event is 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. All four regressions have the same dependent variable, but differ in which fixed effects we activate (hence the variation that we exploit). To construct the dependent variable we use the firm-to-firm transaction data (from D-151 tax forms). These regressions do not include firm-level time-varying controls, x_{it}, only the fixed effects reported in each column. In years when there is no transaction between a given supplier-buyer pair, that triad is dropped. For brevity, the table only contains domestic firms that become first-time suppliers to an MNC (the restricted economy-wide sample). All 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 A5: Domestic Firms Start Selling to (Buying from) More Sectors After Event

	# 2D-Sect Buyers (1)	# 4D-Sect Buyers (2)	# 2D-Sect Suppliers (3)	# 4D-Sect Suppliers (4)	# 2D-Sect Buyers (5)	# 4D-Sect Buyers (6)	# 2D-Sect Suppliers (7)	# 4D-Sect Suppliers (8)
log total sales	0.169***	0.191***	0.265***	0.308***	0.308***	0.352***	0.322***	0.366***
	(0.012)	(0.015)	(0.004)	(0.005)	(0.008)	(0.008)	(0.007)	(0.009)
4 years before event	-0.018	-0.019	-0.006	-0.010	-0.024	-0.033	0.023	0.010
	(0.014)	(0.016)	(0.020)	(0.022)	(0.038)	(0.037)	(0.026)	(0.027)
3 years before event	-0.007	-0.002	-0.015	-0.015	-0.011	-0.009	0.009	0.003
	(0.011)	(0.013)	(0.013)	(0.013)	(0.022)	(0.022)	(0.018)	(0.019)
2 years before event	-0.018	-0.014	-0.003	-0.007	-0.020	-0.017	0.011	0.003
	(0.014)	(0.014)	(0.010)	(0.011)	(0.016)	(0.016)	(0.013)	(0.013)
Year of event	-0.197***	-0.155***	0.023**	0.024**	-0.229***	-0.187***	0.005	0.004
	(0.014)	(0.013)	(0.010)	(0.010)	(0.017)	(0.019)	(0.009)	(0.009)
1 year after event	0.190***	0.218***	0.037***	0.040***	0.128***	0.157***	0.009	0.010
	(0.016)	(0.017)	(0.011)	(0.012)	(0.026)	(0.026)	(0.013)	(0.015)
2 years after event	0.226***	0.260***	0.052***	0.055***	0.146***	0.183***	0.011	0.015
	(0.018)	(0.019)	(0.014)	(0.014)	(0.032)	(0.032)	(0.017)	(0.020)
3 years after event	0.250***	0.285***	0.051***	0.055***	0.173***	0.213***	0.010	0.015
	(0.017)	(0.020)	(0.012)	(0.013)	(0.046)	(0.043)	(0.022)	(0.026)
4 years after event	0.250***	0.288***	0.063***	0.066***	0.174***	0.220***	0.023	0.030
	(0.020)	(0.023)	(0.015)	(0.016)	(0.052)	(0.052)	(0.027)	(0.032)
Mean Dep. Var. (level)	2.57	3.04	4.26	5.48	4.60	6.00	5.44	5.44
SD Dep. Var. (level)	2.66	3.94	3.43	5.50	4.06	6.45	4.62	4.62
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	No	No	No	No
Adjusted R^2	0.82	0.84	0.81	0.84	0.79	0.82	0.82	0.85
# Observations	115,800	115,800	115,800	115,800	23,092	23,092	23,092	23,092
# Fixed Effects	25,101	25,101	25,101	25,101	7,234	7,234	7,234	7,234
# Firms	17,996	17,996	17,996	17,996	3,442	3,442	3,442	3,442

Notes: Table A5 shows the results of running the event-study specification (1) adapted to four dependent variables: the number of 2-digit sectors of buyers in a given year, the number of 4-digit sectors of buyers in a given year, the number of 2-digit sectors of suppliers (of the supplier) in a given year, and the number of 4-digit sectors of suppliers (of the supplier) in a given year. For a given domestic supplier and regression, there is only one observation per year that is an unweighted count of the number of sectors of its buyers (or suppliers) that event year. To avoid mechanical results, the MNC buyer triggering the event is excluded from the set of buyers described in this table. The event is 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. These regressions control for the contemporaneous log total sales of the domestic firm, in addition to firm and 4-digit sector $\times$ province $\times$ calendar year fixed effects. Columns (1)-(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 an MNC during our entire firm-to-firm transaction dataset. Clustering of standard errors is at the 2-digit sector by province level. Columns (5)-(8) focus only on the restricted 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 A6: Buyer Characteristics Change After Domestic Firms Start Supplying MNCs

	Sh Buyers in HT-sect (1)	Ave Empl of Buyers (2)	Ave Sales of Buyers (3)	Ave Exp Sh of Buyers (4)	Sh Buyers in HT-sect (5)	Ave Empl of Buyers (6)	Ave Sales of Buyers (7)	Ave Exp Sh of Buyers (8)
log total sales	-0.001	0.132***	0.159***	0.002	0.003	0.224***	0.245***	0.005**
	(0.001)	(0.021)	(0.024)	(0.001)	(0.002)	(0.044)	(0.046)	(0.002)
4 years before event	-0.004	-0.003	-0.004	-0.008	-0.002	0.190	0.068	-0.007
	(0.004)	(0.073)	(0.077)	(0.005)	(0.008)	(0.125)	(0.123)	(0.008)
3 years before event	-0.006**	-0.077	-0.122**	-0.005	-0.004	0.023	-0.091	-0.004
	(0.003)	(0.055)	(0.050)	(0.004)	(0.006)	(0.097)	(0.099)	(0.005)
2 years before event	-0.003	-0.034	-0.049	0.001	-0.005	-0.011	-0.053	-0.000
	(0.002)	(0.032)	(0.038)	(0.002)	(0.003)	(0.056)	(0.053)	(0.003)
Year of event	-0.007***	-0.210***	-0.213***	-0.010***	-0.007**	-0.302***	-0.253***	-0.011***
	(0.002)	(0.052)	(0.052)	(0.002)	(0.003)	(0.055)	(0.063)	(0.003)
1 year after event	-0.004**	0.184***	0.224***	0.002	-0.006	0.018	0.161**	0.001
	(0.002)	(0.052)	(0.056)	(0.003)	(0.004)	(0.073)	(0.078)	(0.005)
2 years after event	-0.002	0.328***	0.382***	0.008***	-0.004	0.079	0.275***	0.007
	(0.003)	(0.042)	(0.044)	(0.003)	(0.006)	(0.095)	(0.090)	(0.006)
3 years after event	-0.001	0.374***	0.441***	0.012***	-0.003	0.045	0.294**	0.011
	(0.003)	(0.050)	(0.052)	(0.003)	(0.008)	(0.123)	(0.125)	(0.008)
4 years after event	0.000	0.411***	0.459***	0.011***	-0.001	0.027	0.301*	0.009
	(0.003)	(0.052)	(0.055)	(0.004)	(0.010)	(0.164)	(0.159)	(0.010)
Mean Dep. Var. (level)	0.014	431.5	70.8	0.045	0.018	409.6	61.2	0.048
SD Dep. Var. (level)	0.088	1386.4	263.1	0.14	0.078	1168.0	210.7	0.13
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	No	No	No	No
Adjusted R^2	0.64	0.72	0.73	0.77	0.46	0.62	0.64	0.67
# Observations	54,363	54,363	54,363	54,363	18,830	18,830	18,830	18,830
# Fixed Effects	14,998	14,998	14,998	14,998	6,315	6,315	6,315	6,315
# Firms	9,652	9,652	9,652	9,652	3,086	3,086	3,086	3,086

Notes: Table A6 shows the results of running the event-study specification (1) adapted to three dependent variables: the share of buyers in high-tech sectors, the average number of workers of buyers, the average total sales of buyers, and the share of exports in the total sales of the buyers (averaged across all years for a given buyer). For a given domestic firm and regression, there is only one observation per year that is a weighted average of the characteristics of its buyers that year (weighted by their importance to that supplier). To avoid mechanical results, the MNC buyer triggering the event is excluded from the set of buyers described in this table. The event is 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. These regressions do not include firm-level time-varying controls, x_{it}, but only firm and 4-digit sector $\times$ province $\times$ calendar year fixed effects. Columns (1)-(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 an MNC during our entire firm-to-firm transaction dataset. Clustering of standard errors is at the 2-digit sector by province level. Columns (5)-(8) focus only on the restricted 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.

Online Appendix B Robustness of Event-Study Results

Online Appendix B.1 Robustness to Different Sets of Fixed Effects

We investigate the stability of our economy-wide event-study coefficients to four combinations of fixed-effects (FEs). We start with only ten calendar year FEs to control for year-specific shocks. We then add firm FEs, to also control for firm-specific time-invariant characteristics. Next, we replace the calendar year FEs with 4-digit sector $\times$ calendar year FEs to control for industry-specific time-varying shocks. Our preferred combination of FEs (firm and 4-digit sector $\times$ province $\times$ calendar year FEs) allows for a spatial dimension to shocks. We report the event-study coefficients for three outcome variables: log total sales (Table B1), translog TFP (Table B2), and log sales to others (Table B3).

There are three main patterns that come out of these results. First, the largest jump in R^2 occurs upon including firm FEs, especially when the outcome is a measure of firm size and when we do not include firm-specific time-varying controls.[68] Second, adding firm FEs is most consequential for the full sample, in particular for resolving the differential trends before the event. This highlights the differences in levels between first-time suppliers and never-suppliers. Even without firm FEs, in the restricted sample (including only firms that become first-time suppliers to MNCs) there is clear evidence of the lack of trends before the event and the sharp upward trend after. Third, for any combination of FEs (from the parsimonious ten FEs in regressions (1) and (5), to tens of thousands of FEs in all other regressions) all outcomes take off the year of the event.[69] All in all, we conclude that firm FEs are important to control for differences in levels, but do not drive our results.

[68] In Table B2, we already control for second-order Taylor polynomial terms in K_{it}, L_{it}, and M_{it}. Even without firm FEs, the R^2 of the regressions in columns (1) and (5) are already above 0.90.

[69] Also, notice that allowing for potential spatial disparities in 4-digit sector shocks barely affects the results. We keep the additional interaction with the province of the supplier to (modestly) raise the explanatory power.

Table B1: Robustness of Baseline Event-Study Results for Total Sales to Different Sets of Fixed Effects

Outcome: (log) Total Sales	(1)	(2)	(3)	(4) Baseline	(5)	(6)	(7)	(8) Baseline
4 years before event	0.414***	0.072***	0.043	0.044	0.067	-0.021	-0.022	-0.022
	(0.069)	(0.027)	(0.027)	(0.028)	(0.077)	(0.059)	(0.043)	(0.053)
3 years before event	0.406***	0.067***	0.038*	0.029	0.104**	0.011	-0.000	0.001
	(0.058)	(0.020)	(0.021)	(0.023)	(0.048)	(0.041)	(0.035)	(0.041)
2 years before event	0.348***	0.045**	0.031*	0.026	0.071**	0.023	0.014	0.007
	(0.060)	(0.019)	(0.018)	(0.018)	(0.035)	(0.030)	(0.024)	(0.023)
Year of event	0.281***	0.158***	0.167***	0.159***	0.132***	0.200***	0.190***	0.191***
	(0.049)	(0.021)	(0.019)	(0.019)	(0.025)	(0.020)	(0.019)	(0.021)
1 year after event	0.476***	0.338***	0.337***	0.325***	0.384***	0.406***	0.375***	0.377***
	(0.040)	(0.029)	(0.027)	(0.028)	(0.041)	(0.033)	(0.027)	(0.035)
2 years after event	0.537***	0.370***	0.361***	0.351***	0.496***	0.457***	0.404***	0.408***
	(0.039)	(0.035)	(0.031)	(0.032)	(0.051)	(0.045)	(0.041)	(0.054)
3 years after event	0.586***	0.365***	0.351***	0.342***	0.561***	0.462***	0.390***	0.389***
	(0.042)	(0.039)	(0.033)	(0.035)	(0.062)	(0.056)	(0.054)	(0.072)
4 years after event	0.648***	0.358***	0.345***	0.334***	0.639***	0.462***	0.382***	0.382***
	(0.043)	(0.040)	(0.035)	(0.037)	(0.075)	(0.066)	(0.064)	(0.089)
Mean Dep. Var. (level)	0.85	0.85	0.85	0.85	1.45	1.45	1.45	1.45
SD Dep. Var. (level)	2.54	2.54	2.54	2.54	4.50	4.50	4.50	4.50
Firm FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
Year-4DSect FE	No	No	Yes	No	No	No	Yes	No
Year-4DSect-Prov FE	No	No	No	Yes	No	No	No	Yes
Never Suppliers	Yes	Yes	Yes	Yes	No	No	No	No
Adjusted R^2	0.037	0.76	0.77	0.77	0.024	0.79	0.80	0.80
# Observations	116,683	116,683	116,683	116,683	23,961	23,961	23,961	23,961
# Fixed Effects	10	18,045	19,942	25,174	10	3,492	4,919	7,366
# Firms	18,035	18,035	18,035	18,035	3,482	3,482	3,482	3,482

Notes: Table B1 shows the results of running four variants of the event-study specification (1) for one dependent variable: log total sales. 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)-(4) correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers), columns (5)-(8) correspond to the restricted economy-wide sample (including only first-time suppliers to MNCs). These regressions do not include firm-level time-varying controls, x_{it}. The only difference between columns (1)-(4) and between columns (5)-(8) comes from the combination of fixed effects used in each column. Columns (4) and (8) use our preferred combination of fixed effects. 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 B2: Robustness of Baseline Event-Study Results for Translog TFP to Different Sets of Fixed Effects

Outcome: TL TFPR	(1)	(2)	(3)	(4) Baseline	(5)	(6)	(7)	(8) Baseline
4 years before event	0.051***	0.019	0.017	0.015	0.023	0.026	0.023	0.017
	(0.018)	(0.013)	(0.013)	(0.013)	(0.021)	(0.025)	(0.024)	(0.018)
3 years before event	0.044***	0.020**	0.018*	0.019**	0.021	0.026	0.019	0.020
	(0.014)	(0.009)	(0.010)	(0.009)	(0.019)	(0.016)	(0.016)	(0.015)
2 years before event	0.033***	0.005	0.004	0.007	0.011	0.013	0.010	0.010
	(0.012)	(0.009)	(0.009)	(0.008)	(0.010)	(0.012)	(0.011)	(0.011)
Year of event	0.091***	0.038***	0.042***	0.044***	0.069***	0.042***	0.043***	0.041***
	(0.013)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)
1 year after event	0.096***	0.050***	0.055***	0.057***	0.075***	0.051***	0.051***	0.051***
	(0.012)	(0.010)	(0.011)	(0.012)	(0.011)	(0.014)	(0.013)	(0.012)
2 years after event	0.100***	0.057***	0.064***	0.067***	0.081***	0.056***	0.059***	0.054***
	(0.013)	(0.011)	(0.012)	(0.012)	(0.016)	(0.018)	(0.017)	(0.017)
3 years after event	0.091***	0.051***	0.062***	0.064***	0.074***	0.048**	0.053**	0.049**
	(0.012)	(0.012)	(0.013)	(0.013)	(0.023)	(0.023)	(0.020)	(0.020)
4 years after event	0.089***	0.050***	0.064***	0.066***	0.072***	0.041	0.049*	0.043*
	(0.011)	(0.013)	(0.015)	(0.015)	(0.025)	(0.030)	(0.026)	(0.025)
Mean Dep. Var. (level)	1.12	1.12	1.12	1.12	2.00	2.00	2.00	2.00
SD Dep. Var. (level)	3.17	3.17	3.17	3.17	5.74	5.74	5.74	5.74
Firm FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
Year-4DSect FE	No	No	Yes	No	No	No	Yes	No
Year-4DSect-Prov FE	No	No	No	Yes	No	No	No	Yes
Never Suppliers	Yes	Yes	Yes	Yes	No	No	No	No
Adjusted R^2	0.90	0.96	0.96	0.97	0.93	0.97	0.97	0.97
# Observations	64,419	64,419	64,419	64,419	13,706	13,706	13,706	13,706
# Fixed Effects	10	10,502	12,079	15,464	10	2,154	3,238	4,774
# Firms	10,492	10,492	10,492	10,492	2,144	2,144	2,144	2,144

Notes: Table B2 shows the results of running four variants of the event-study specification (1) for one dependent variable: a measure of TFP based on a translog production function (OLS regression). 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)-(4) correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers), columns (5)-(8) correspond to the restricted economy-wide sample (including only first-time suppliers to MNCs). The only difference between columns (1)-(4) and between columns (5)-(8) comes from the combination of fixed effects used in each column. Columns (4) and (8) use our preferred combination of fixed effects. 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 B3: Robustness of Baseline Event-Study Results for Sales to Others to Different Sets of Fixed Effects

Outcome: (log) Sales to Others	(1)	(2)	(3)	(4) Baseline	(5)	(6)	(7)	(8) Baseline
4 years before event	0.411***	0.018	-0.014	0.011	0.050	-0.113	-0.033	-0.047
	(0.070)	(0.042)	(0.044)	(0.042)	(0.075)	(0.096)	(0.103)	(0.119)
3 years before event	0.401***	-0.004	-0.029	-0.022	0.082*	-0.087	-0.042	-0.041
	(0.059)	(0.034)	(0.036)	(0.035)	(0.048)	(0.069)	(0.072)	(0.076)
2 years before event	0.343***	-0.021	-0.030	-0.020	0.058	-0.053	-0.026	-0.028
	(0.060)	(0.030)	(0.029)	(0.028)	(0.035)	(0.039)	(0.039)	(0.036)
Year of event	-0.242**	-0.218***	-0.201***	-0.193***	-0.356***	-0.140***	-0.151***	-0.122*
	(0.106)	(0.053)	(0.053)	(0.052)	(0.060)	(0.049)	(0.056)	(0.062)
1 year after event	0.108	0.114**	0.124**	0.118**	0.055	0.217***	0.169**	0.205**
	(0.095)	(0.053)	(0.052)	(0.053)	(0.072)	(0.070)	(0.078)	(0.090)
2 years after event	0.227***	0.203***	0.200***	0.201***	0.251***	0.343***	0.257**	0.320***
	(0.080)	(0.047)	(0.044)	(0.045)	(0.083)	(0.092)	(0.099)	(0.115)
3 years after event	0.292***	0.204***	0.202***	0.196***	0.358***	0.388***	0.268**	0.333**
	(0.082)	(0.051)	(0.045)	(0.046)	(0.108)	(0.111)	(0.126)	(0.147)
4 years after event	0.406***	0.193***	0.196***	0.203***	0.507***	0.401***	0.275*	0.380**
	(0.082)	(0.058)	(0.050)	(0.049)	(0.111)	(0.139)	(0.146)	(0.171)
Mean Dep. Var. (level)	0.84	0.84	0.84	0.84	1.42	1.42	1.42	1.42
SD Dep. Var. (level)	2.54	2.54	2.54	2.54	4.51	4.51	4.51	4.51
Firm FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
Year-4DSect FE	No	No	Yes	No	No	No	Yes	No
Year-4DSect-Prov FE	No	No	No	Yes	No	No	No	Yes
Never Suppliers	Yes	Yes	Yes	Yes	No	No	No	No
Adjusted R^2	0.012	0.69	0.69	0.70	0.016	0.64	0.64	0.64
# Observations	116,536	116,536	116,536	116,536	23,801	23,801	23,801	23,801
# Fixed Effects	10	18,034	19,931	25,156	10	3,478	4,903	7,328
# Firms	18,024	18,024	18,024	18,024	3,468	3,468	3,468	3,468

Notes: Table B3 shows the results of running four variants of the event-study specification (1) for one dependent variable: log total sales except those to first MNC buyer. 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)-(4) correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers), columns (5)-(8) correspond to the restricted economy-wide sample (including only first-time suppliers to MNCs). These regressions do not include firm-level time-varying controls, x_{it}. The only difference between columns (1)-(4) and between columns (5)-(8) comes from the combination of fixed effects used in each column. Columns (4) and (8) use our preferred combination of fixed effects. 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 B.2 Robustness to Excluding First-time Suppliers Hiring New Managers

Table B4: Robustness of Baseline Event-Study Results for Total Sales to Excluding First-time Suppliers Hiring New Managers

Outcome: (log) Total Sales	Baseline	No ΔT1 Event	No ΔT2 Event	No ΔT1 Event-1	No ΔT2 Event-1	Baseline	No ΔT1 Event	No ΔT2 Event	No ΔT1 Event-1	No ΔT2 Event-1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
4 years before event	0.044	0.032	0.018	0.060**	0.047	-0.022	-0.053	-0.023	-0.008	-0.009
	(0.028)	(0.029)	(0.031)	(0.027)	(0.031)	(0.053)	(0.056)	(0.057)	(0.055)	(0.052)
3 years before event	0.029	0.021	0.014	0.053**	0.043*	0.001	-0.014	0.017	0.029	0.015
	(0.023)	(0.025)	(0.026)	(0.025)	(0.022)	(0.041)	(0.044)	(0.041)	(0.045)	(0.043)
2 years before event	0.026	0.012	0.014	0.057***	0.044**	0.007	-0.007	0.008	0.042*	0.029
	(0.018)	(0.019)	(0.019)	(0.017)	(0.017)	(0.023)	(0.022)	(0.023)	(0.023)	(0.024)
Year of event	0.159***	0.118***	0.123***	0.143***	0.130***	0.191***	0.158***	0.142***	0.181***	0.160***
	(0.019)	(0.016)	(0.021)	(0.019)	(0.018)	(0.021)	(0.025)	(0.024)	(0.022)	(0.020)
1 year after event	0.325***	0.278***	0.274***	0.312***	0.303***	0.377***	0.345***	0.301***	0.374***	0.356***
	(0.028)	(0.023)	(0.025)	(0.027)	(0.028)	(0.035)	(0.040)	(0.042)	(0.036)	(0.035)
2 years after event	0.351***	0.300***	0.283***	0.339***	0.325***	0.408***	0.374***	0.303***	0.411***	0.385***
	(0.032)	(0.027)	(0.028)	(0.033)	(0.032)	(0.054)	(0.063)	(0.061)	(0.055)	(0.053)
3 years after event	0.342***	0.284***	0.279***	0.331***	0.320***	0.389***	0.360***	0.281***	0.402***	0.373***
	(0.035)	(0.029)	(0.031)	(0.035)	(0.033)	(0.072)	(0.086)	(0.083)	(0.075)	(0.070)
4 years after event	0.334***	0.280***	0.272***	0.325***	0.315***	0.382***	0.362***	0.267**	0.402***	0.371***
	(0.037)	(0.034)	(0.034)	(0.037)	(0.036)	(0.089)	(0.108)	(0.100)	(0.094)	(0.087)
Mean Dep. Var. (level)	0.85	0.84	0.84	0.85	0.85	1.45	1.44	1.46	1.45	1.46
SD Dep. Var. (level)	2.54	2.47	2.35	2.50	2.44	4.50	4.28	4.01	4.33	4.20
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
Never Suppliers	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Adjusted R^2	0.77	0.77	0.77	0.77	0.77	0.80	0.81	0.81	0.81	0.80
# Observations	116,683	114,541	113,172	115,045	114,381	23,961	21,793	20,482	22,305	21,698
# Fixed Effects	25,174	24,769	24,488	24,895	24,761	7,366	6,816	6,507	6,948	6,832
# Firms	18,035	17,681	17,443	17,807	17,699	3,482	3,118	2,902	3,253	3,154

Notes: Table B4 shows the results of running the event-study specification (1) for one dependent variable: log total sales. 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)-(5) correspond to the full economy-wide sample (including first-time suppliers to MNCs and never-suppliers), columns (6)-(10) correspond to the restricted economy-wide sample (including only first-time suppliers to MNCs). Columns (1) and (6) report our baseline results from Columns (1) and (5) in Table 1. Columns (2)-(5) differ from Column (1) (columns (7)-(10) differ from Column (6)) in their excluding first-time suppliers who have hired new managers either in the event year ("Event") or in the year prior to the event ("Event-1"). In this exercise, we identify managers as the top earners that year. In columns (2), (4), (7), and (9) we only drop first-time suppliers that hire a new worker that becomes the top earner in the firm (presumably the top manager or "T1"), whereas in columns (3), (5), (8), and (10) we also drop first-time suppliers that hire a new worker that becomes the top 2 earner in the firm (presumably the top 2 manager or "T2"). Means (in levels) are reported in millions of U.S. dollars (CPI-deflated to 2013 dollars). ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix B.3 Robustness to Balancing the Sample in Event Time

In Table B5, we replicate the main economy-wide event-study analysis on a version of the restricted sample balanced in event time from *-1* to *+1*. This new sample allow 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 B5: Robustness of Baseline Event-Study Results to Using a Balanced Sample in Event Time

	CD *K,L,M* (1)	TL *K,L,M* (2)	CD Index (3)	Y (4)	L (5)	K (6)	VA (7)	Sales to Others (8)	Total Trans (9)	Trans w/ Others (10)	Number Buyers (11)
4 years before event	0.01	0.03	-0.01	0.05	0.00	-0.08	-0.02	-0.01	0.04	0.03	0.02
	(0.03)	(0.03)	(0.04)	(0.07)	(0.06)	(0.10)	(0.08)	(0.10)	(0.11)	(0.18)	(0.05)
3 years before event	0.01	0.03	-0.01	0.05	0.01	-0.05	-0.02	-0.02	0.04	0.03	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	-0.00	0.03	0.01	-0.00	0.00	-0.03	0.04	0.06	0.01
	(0.01)	(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***	0.04**	0.29***	0.24***	0.20***	0.21***	0.05	0.38***	-0.42***	0.08***
	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)	(0.04)	(0.03)	(0.05)	(0.04)	(0.14)	(0.03)
1 year after event	0.07***	0.04**	0.07***	0.30***	0.24***	0.21***	0.22***	0.14*	0.40***	0.18	0.19***
	(0.02)	(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*	0.08***	0.29***	0.23***	0.28***	0.24***	0.18*	0.39***	0.31*	0.22***
	(0.03)	(0.02)	(0.03)	(0.07)	(0.05)	(0.07)	(0.06)	(0.10)	(0.10)	(0.18)	(0.05)
3 years after event	0.08**	0.04	0.10**	0.24***	0.21***	0.30***	0.25***	0.16	0.39***	0.45**	0.21***
	(0.04)	(0.03)	(0.04)	(0.09)	(0.07)	(0.10)	(0.08)	(0.12)	(0.12)	(0.23)	(0.06)
4 years after event	0.07	0.03	0.09*	0.22**	0.16*	0.31**	0.23**	0.18	0.36**	0.41	0.20**
	(0.05)	(0.04)	(0.05)	(0.11)	(0.09)	(0.12)	(0.09)	(0.14)	(0.15)	(0.28)	(0.08)
Mean Dep. Var. (level)	2.20	2.20	0.86	1.64	21.7	1.07	0.25	1.61	0.62	0.60	17.3
SD Dep. Var. (level)	5.99	5.99	0.49	4.84	50.4	3.27	0.66	4.85	1.92	1.93	50.8
Firm FE	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
Never Suppliers	No	No	No	No	No	No	No	No	No	No	No
Balanced Only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.97	0.98	0.75	0.81	0.80	0.82	0.74	0.67	0.75	0.57	0.84
# Observations	10,295	10,295	10,295	17,203	17,203	17,203	17,203	17,203	17,203	17,203	17,203
# Fixed Effects	3,655	3,655	3,655	5,437	5,437	5,437	5,437	5,437	5,437	5,437	5,437
# Firms	1,416	1,416	1,416	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145

Notes: Table B5 shows the results of running the event-study specification (1) adapted to eleven 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 employment 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 B.4 Robustness to the Definition of the Event Year

One pattern that is potentially puzzling is the onset of treatment effects from event year *0*. While increases in firm size might to some degree be mechanical (if firms do not shed domestic buyers when becoming suppliers to an MNC), increases in performance may be expected with delay. To shed light on this pattern, one would ideally observe both the moment when the domestic firm starts its collaboration with its first MNC buyer and the moment when the first payment is made. Unfortunately, in the firm-to-firm transaction dataset, we cannot observe the starting date for the collaboration. What this dataset can offer is the *year of the first transaction* of a domestic firm with an MNC, which we label as event year *0*. This dataset also does not record when during a year transactions occur, only the cumulative value transacted in a year between two firms.

To make progress, we use the data from Procomer described in Online Appendix F.2. We first find that in the full sample of 1,985 deals mediated by Procomer between 2001 and 2016, the dates when deals are agreed upon are evenly distributed across months. While the dates recorded by Procomer as the dates of the agreement are not necessarily those when the transaction is made, we assume there is no reason for transactions to be more concentrated in certain months of the year. Second, from the email archive shared with us, we found that around 65% of deals go from first contact to agreeing on the deal in the same calendar year. Another 27% of deals have the date of the first contact and the sealing of the deal one calendar year apart. In our surveys to domestic firms we asked a slightly different question: "How quickly did your firm find a first MNC buyer after deciding that it wanted to have such buyers?" 55% of firms responded that it took less than a year, 9% between 1 and 2 years, and 8.5% over 2 years (see Online Appendix G). Jointly, these findings suggest that most transactions are likely to occur within a year of the first contact.

Given the information available in firm-to-firm transaction data, one cannot disentangle the following two scenarios (or combinations thereof). In one scenario, effects in event year *0* reflect adjustment and learning in the new role as a supplier to an MNC. These processes may be onset as soon as the collaboration starts, most likely in the preceding months to the transaction. In the other scenario, the smaller year *0* effects are simply "partial year effects" (Bernard, Boler, Massari, Reyes, and Taglioni, 2017). If the lag between the first contact and the first transaction is short, this would suggest fast learning in the new role of supplier to MNCs. As we cannot distinguish between these scenarios, we recommend caution on the interpretation of year *0* effects. That said, a potentially-imprecise measure of the exact year *0* does not affect the causal interpretation of our results or their general pattern of growth.

As a robustness check, instead of defining the event year as the first year when we observe domestic firm i having a transaction with an MNC buyer, we define it as the year *prior* to that of the first transaction. With this definition of the event year, we are focusing on what is likely to be the year of the first contact with an MNC (for contacts that materialize in a transaction a year later). Table B6 shows that, with this new definition of the event year, results are almost mechanically delayed by a year, with the first gains in TFP manifesting themselves a

year after the presumable first contact. While our preferred definition of the event year is the year when they first transact with an MNC, we are reassured that results are only changed in their timing as we shift the event year one year backwards.

Table B6: Robustness of Baseline Event-Study Results to Different Definition of Event Year

	Prod Index (1)	CD *K,L,M* (2)	TL *K,L,M* (3)	Prod Index (4)	CD *K,L,M* (5)	TL *K,L,M* (6)
4 years before "event"	-0.008	0.001	-0.002	-0.064**	-0.057*	-0.051*
	(0.019)	(0.017)	(0.014)	(0.029)	(0.030)	(0.025)
3 years before "event"	0.019	0.001	0.007	-0.023	-0.039*	-0.025
	(0.024)	(0.017)	(0.016)	(0.023)	(0.021)	(0.016)
2 years before "event"	0.019	0.005	0.011	-0.012	-0.025	-0.009
	(0.013)	(0.012)	(0.010)	(0.014)	(0.015)	(0.012)
Year of "event"	-0.006	-0.015	-0.008	0.013	-0.001	0.007
	(0.011)	(0.010)	(0.009)	(0.011)	(0.012)	(0.010)
1 year after "event"	0.030**	0.043***	0.036***	0.060***	0.062***	0.062***
	(0.014)	(0.012)	(0.010)	(0.020)	(0.022)	(0.014)
2 years after "event"	0.053***	0.067***	0.049***	0.103***	0.099***	0.088***
	(0.014)	(0.014)	(0.012)	(0.021)	(0.025)	(0.016)
3 years after "event"	0.053***	0.073***	0.060***	0.125***	0.118***	0.112***
	(0.016)	(0.014)	(0.013)	(0.024)	(0.028)	(0.020)
4 years after "event"	0.055**	0.073***	0.057***	0.148***	0.140***	0.130***
	(0.022)	(0.017)	(0.016)	(0.031)	(0.034)	(0.025)
Mean Dep. Var. (level)	0.93	559.5	559.5	0.86	1100.8	1100.8
SD Dep. Var. (level)	0.56	1584.7	1584.7	0.49	2994.4	2994.4
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	0.72	0.95	0.97	0.75	0.97	0.98
# Observations	64,419	64,419	64,419	10,295	10,295	10,295
# Fixed Effects	15,464	15,464	15,464	3,655	3,655	3,655
# Firms	10,492	10,492	10,492	1,416	1,416	1,416

Notes: Table B6 shows the results of running specification (1) adapted to the same three measures of TFP defined for Table 4. There is only one difference with respect to specification (1): in this table, instead of defining the event year as the first year when we observe domestic firm i having a transaction with an MNC buyer, we define the event year as the year *prior* to that of the first transaction. With this definition of the event year, we are focusing on what may be the year of the first contact with an MNC (for contacts that materialize in a transaction a year later). Results for *4 years before "event"* are particularly noisy as they use data only for firms we observe 5 years before their first year transacting with an MNC. Columns (1)-(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 an MNC during our entire firm-to-firm transaction data. Clustering of standard errors is at the 2-digit sector by province level. Columns (4)-(6) focus only on the sample of domestic firms becoming first-time suppliers to an MNC after 2010 and use standard error clustering at event by province level. 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 B.5 No Evidence of Changes in Third-Party Reporting

Table B7: Similar Compliance in Third Party Reporting After Supplying 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 B7 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 main analysis (see Online Appendix F.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)-(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 an MNC during our entire firm-to-firm transaction data. Clustering of standard errors is at the 2-digit sector by province level. Columns (4)-(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.

In addition to the discussion in Section 4.2.3 (based on the results in Table B7), note that we find marked increases in measures of firm performance that either do not have a direct link to firms' tax liability or imply an opposite behavior to that predicted by a mere reduction in tax-evasive behaviors (see Section 4.1). For instance, had costs been artificially high prior to a first deal with an MNC, a higher scrutiny on firms dealing with MNCs would imply a lowering of their previously-inflated costs. The marked boost in input costs (see columns (4) and (8) of Table 1) suggests a legitimate expansion in operations. Moreover, persistent boosts in proxies of TFP (e.g., sales/worker, OLS production function estimation) are implausible behavioral responses to what may be a heightened scrutiny on one's tax compliance. It is therefore unlikely that tax compliance effects can reproduce our baseline results.

Online Appendix C Additional Model Derivations

In this section we present the derivations of the main results of the model. In the environment introduced in Section 5, we have that (i) $Q = Bp^{-\sigma}$ (demand equation) and (ii) $p = c_0 Q^{\frac{1}{\gamma}-1}\phi^{\frac{-1}{\gamma}}$ (price equal constant mark-up times marginal cost), where $Q = \sum_i q_i$ and $B \equiv \sum_i n_i b_i$.

Online Appendix C.1 Derivation of Equation (3)

Combining (i) and (ii) from above we have that $Q = B\left(c_0 Q^{\frac{1}{\gamma}-1}\phi^{\frac{-1}{\gamma}}\right)^{-\sigma}$, which implies:

$$Q = \left(c_0^{-\sigma\gamma} B^{\gamma}\phi^{\sigma}\right)^{\frac{1}{\gamma+\sigma-\sigma\gamma}}. \tag{C1}$$

$$\begin{aligned} \Rightarrow pQ &= c_0 Q^{\frac{1}{\gamma}-1}\phi^{\frac{-1}{\gamma}}\left(Bc_0^{-\sigma\gamma}\phi^{\sigma}\right)^{\frac{1}{\gamma+\sigma-\sigma\gamma}} \\ &= c_1 B^{\frac{1}{\gamma+\sigma-\sigma\gamma}}\phi^{\frac{\sigma-1}{\gamma+\sigma-\sigma\gamma}}, \end{aligned} \tag{C2}$$

where $c_1 = c_0^{\frac{\gamma+\sigma-2\sigma\gamma}{\gamma+\sigma-\sigma\gamma}}$. Equation (C2) is useful because it allows us to write B (which is not observable) as a function of total sales (which we observe), the constant c_1, and ϕ (the most relevant variable in our context). Let us invert equation (C2) as follows (the usefulness of this will become clear soon):

$$B^{\frac{1}{\gamma+\sigma-\sigma\gamma}} = c_1^{-1}(pQ)\phi^{-\frac{(\sigma-1)}{\gamma+\sigma-\sigma\gamma}}. \tag{C3}$$

Define the quantity sold to others as $\widetilde{Q} = \sum_{i\neq MNC_0} q_i = \tilde{B}p^{-\sigma}$. We can write total sales to others as:

$$\begin{aligned} p\tilde{Q} = p\tilde{B}p^{-\sigma} = \tilde{B}\left(c_0 Q^{\frac{1}{\gamma}-1}\phi^{\frac{-1}{\gamma}}\right)^{1-\sigma} &= \tilde{B}c_0^{1-\sigma}\phi^{\frac{\sigma-1}{\gamma}}Q^{\frac{(\gamma-1)(\sigma-1)}{\gamma}} \\ = \tilde{B}c_0^{1-\sigma}\phi^{\frac{\sigma-1}{\gamma}}\left(c_0^{-\frac{\sigma\gamma}{\gamma+\sigma-\sigma\gamma}} B^{\frac{\gamma}{\gamma+\sigma-\sigma\gamma}}\phi^{\frac{\sigma}{\gamma+\sigma-\sigma\gamma}}\right)^{\frac{(\gamma-1)(\sigma-1)}{\gamma}} \end{aligned}$$

$$= c_2 \tilde{B} \phi^{\frac{\sigma-1}{\gamma+\sigma-\sigma\gamma}} \left[B^{\frac{1}{\gamma+\sigma-\sigma\gamma}} \right]^{(\gamma-1)(\sigma-1)}, \tag{C4}$$

where we use equation (C1) to go from the second to the third line and $c_2 = c_0^{\frac{\gamma(1-\sigma)}{\gamma+\sigma-\sigma\gamma}}$.

When $\gamma \neq 1$ (the supplier does not have constant returns to scale), the equilibrium sales to others depend not only on the demand shifter of those other buyers ($\tilde{B}$), but also on the aggregate demand shifter (B) that includes the first MNC buyer, MNC_0. This happens because the demand from MNC_0 may affect the scale of the firm and thus its price, even if $\tilde{B}$ and ϕ remain constant. When $\gamma = 1$, equation (C4) collapses to an analogous of equation (C2). We now make use of equation (C3). Substituting equation (C3) into (C4) gives us:

$$\begin{aligned} p\tilde{Q} &= c_2 \tilde{B} \phi^{\frac{\sigma-1}{\gamma+\sigma-\sigma\gamma}} \left[c_1^{-1} (pQ) \phi^{-\frac{(\sigma-1)}{\gamma+\sigma-\sigma\gamma}} \right]^{(\gamma-1)(\sigma-1)} \\ &= c_2 c_1^{-(\gamma-1)(\sigma-1)} \tilde{B} \phi^{\sigma-1} (pQ)^{(\gamma-1)(\sigma-1)}. \end{aligned}$$

Defining $\delta \equiv \delta(\gamma, \sigma) = (\gamma - 1)(\sigma - 1)$ and substituting in the previous equation we find:

$$p\tilde{Q} = c_3 \tilde{B} \phi^{(\sigma-1)} (pQ)^{\delta}, \tag{C5}$$

where $c_3 = c_2 c_1^{-(\gamma-1)(\sigma-1)}$. Using $1 - \frac{1}{\gamma} < \frac{1}{\sigma}$ from the second order condition for profit maximization we get $0 < \gamma + \sigma - \sigma\gamma = -(\gamma - 1)(\sigma - 1) + 1 = -\delta + 1$, and conclude that $\delta < 1$. Since $\gamma > 0$ then $\gamma - 1 > -1$. Finally, $\delta > -(\sigma - 1)$. Thus $\delta \in (1 - \sigma, 1)$. Taking logs of both sides of equation (C5) and defining $\kappa' = \ln(c_3)$ we arrive to equation (3) in the paper.

Online Appendix C.2 Derivation of Result 1

We start from the equilibrium relation in equation (3) and take the total derivative of both sides of the equation. We then rearrange terms such that the left-hand side depends only on variables that are observable in firm-to-firm transaction data and δ. Last, we take expectations over all domestic firms that experience an event and find:

$$\begin{aligned} \mathbb{E}\left[\mathrm{dln}(p\widetilde{Q})\right] - \delta \mathbb{E}\left[\mathrm{dln}(pQ)\right] &= \mathbb{E}\left[\mathrm{dln}(\widetilde{B})\right] + (\sigma - 1)\varepsilon_\phi \\ \Rightarrow \mathbb{E}\left[\mathrm{dln}\left(\frac{p\widetilde{Q}}{(pQ)^{\delta}}\right)\right] &= \mathbb{E}\left[\mathrm{dln}(\widetilde{B})\right] + (\sigma - 1)\varepsilon_\phi, \end{aligned} \tag{C6}$$

where $\varepsilon_\phi = \mathbb{E}\left[\mathrm{dln}(\phi)\right]$.

Let us focus on the term $\mathbb{E}\left[\mathrm{dln}(\widetilde{B})\right]$. Recall that $\widetilde{B}$ depends on $n_i(\phi, r) \forall i \neq MNC_0$. A change in firm TFP ($\phi$) or reputation ($r$) triggered by the event induces a new demand shock (a change in $\widetilde{B}$) coming from an increase in the probability to sell to new buyers. The total derivative of $\ln(\widetilde{B})$ can thus be split into a part that accounts for changes in probabilities (n_i)

for a constant demand shifter (b_i) and one that accounts for changes in b_i for a constant n_i.

$$\begin{aligned}
\mathbb{E}\left[\mathrm{dln}(\widetilde{B})\right] =& \mathbb{E}\left[\frac{1}{\widetilde{B}}\mathrm{d}\widetilde{B}\right] = \mathbb{E}\left[\frac{1}{\widetilde{B}}\sum_{i\neq MNC_0}^{N} b_i\mathrm{d}(n_i) + n_i\mathrm{d}(b_i)\right] = \mathbb{E}\left[\frac{1}{\widetilde{B}}\sum_{i\neq MNC_0}^{N} n_i b_i\mathrm{dln}(n_i) + n_i b_i\mathrm{dln}(b_i)\right] \\
=& \mathbb{E}\left[\sum_{i\neq MNC_0}^{N} \mathrm{dln}(n_i)\frac{n_i b_i}{\sum_{k\neq MNC_0}^{N} n_k b_k} + \mathrm{dln}(b_i)\frac{n_i b_i}{\sum_{k\neq MNC_0}^{N} n_k b_k}\right] \\
=& \mathbb{E}\left[\sum_{i\neq MNC_0}^{N} \mathrm{dln}(n_i)\frac{n_i b_i}{\sum_{k\neq MNC_0}^{N} n_k b_k}\right] + \mathbb{E}\left[\sum_{i\neq MNC_0}^{N} \mathrm{dln}(b_i)\frac{n_i b_i}{\sum_{k\neq MNC_0}^{N} n_k b_k}\right] \\
=& \varepsilon_{\widetilde{n}} + \varepsilon_{\widetilde{b}}, \qquad \text{(C7)}
\end{aligned}$$

where $\varepsilon_{\widetilde{n}}$ and $\varepsilon_{\widetilde{b}}$ are expectations of weighted averages of $\mathrm{dln}(n_i)$ and $\mathrm{dln}(b_i)$, respectively, $\forall i \neq MNC_0$. The weights are equal to $\frac{n_i b_i}{\sum_{k\neq MNC_0}^{N} n_k b_k}$. Note that these weights sum up to one.

We assume that the demand shifters ($b_i = y_i/P_i^{1-\sigma}$) of other buyers do not change systematically as a consequence of the event. This assumption (which implies $\varepsilon_{\widetilde{b}} = 0$) in combination with our result in equation (C7) allow us to simplify equation (C6) to:

$$\mathbb{E}\left[\mathrm{dln}\left(\frac{p\widetilde{Q}}{(pQ)^{\delta}}\right)\right] = (\sigma-1)\varepsilon_{\phi} + \varepsilon_{\widetilde{n}}. \qquad \text{(C8)}$$

Note that through the lens of our model, the left-hand side of equation (C8) informs us about changes in either ϕ or n_i (owed to changes in either ϕ, r, or both). Equation (C8) is the same as equation (4) in the paper. The interpretation of this equation leads to Result 1.

Online Appendix C.3 Derivation of Result 2

To estimate the change in TFP alone (ε_{ϕ}), we rely on two additional assumptions: (a.i) there is a large number of potential buyers in the country and (a.ii) for any changes in ϕ and/or r, all buyers i equally adjust their probability to source from the supplier, i.e., $\mathrm{dln}(n_i) = \mathrm{dln}(n)$, $\forall i \neq MNC_0$. We discuss assumption (a.ii) in detail in Online Appendix D.5.

Under assumption (a.i), the total number of other buyers of the supplier ($\widetilde{N}$) is given by the sum of the probabilities of buying from the supplier: $\widetilde{N} = \sum_{i\neq MNC_0}^{N} n_i$. This allows us to exploit the change in the number of buyers after the event. Assumption (a.ii) in combination with our definition of $\varepsilon_{\widetilde{n}}$ (see equation (C7)) implies that $\varepsilon_{\widetilde{n}} = \mathbb{E}\left[\mathrm{dln}(n)\right]$.

We can then write the expected derivative of the log number of other buyers as:

$$\mathbb{E}\left[\mathrm{dln}(\widetilde{N})\right] = \mathbb{E}\left[\frac{1}{\widetilde{N}}\mathrm{d}\widetilde{N}\right] = \mathbb{E}\left[\frac{1}{\widetilde{N}}\sum_{i\neq MNC_0}^{N} \mathrm{d}(n_i)\right] = \mathbb{E}\left[\sum_{i\neq MNC_0}^{N} \frac{\mathrm{d}(n_i)}{n_i}\frac{n_i}{\widetilde{N}}\right]$$

$$= \mathbb{E}\left[\sum_{i \neq MNC_0}^{N} \text{dln}(n_i) \frac{n_i}{\sum_{k \neq MNC_0}^{N} n_k}\right] = \mathbb{E}\left[\text{dln}(n) \sum_{i \neq MNC_0}^{N} \frac{n_i}{\sum_{k \neq MNC_0}^{N} n_k}\right]$$
$$= \mathbb{E}\left[\text{dln}(n)\right] = \varepsilon_{\tilde{n}}.$$

We can then write equation (C8) as:

$$\mathbb{E}\left[\text{dln}\left(\frac{p\widetilde{Q}}{(pQ)^{\delta}}\right)\right] = (\sigma - 1)\varepsilon_{\phi} + \mathbb{E}\left[\text{dln}(\widetilde{N})\right]$$
$$\Rightarrow \mathbb{E}\left[\text{dln}\left(\frac{p\widetilde{Q}/\left(pQ\right)^{\delta}}{\widetilde{N}}\right)\right] = (\sigma - 1)\varepsilon_{\phi}, \tag{C9}$$

where we refer to the left-hand side of the equation as the *average adjusted sales to others*. Finally, dividing both sides of this equation by $(\sigma - 1)$ leads to Result 2.

Online Appendix D Additional Model-Relevant Evidence

Online Appendix D.1 Motivating the Use of Public Demand Shocks

MNC buyers may differ from domestic buyers not only in their potential for knowledge transfers (that may help improve the efficiency, quality, or product mix of suppliers), but also in features of their contracts that are themselves attractive to domestic suppliers. According to our survey answers (see Question 2 in Online Appendix G.3), reliable payment, the potential for future scaling of the collaboration, transparent decision-making are attractive features of supplying MNC. An indirect way to check whether these features are the main drivers of our results is to study the effects of other types of demand shocks that share these relevant features with demand shocks from MNCs. For this reason, we study the effects of starting to procure the government on the performance of domestic firms.

Government procurement accounted for approximately 15% of the 2014 Costa Rican GDP (excluding oil revenues) (OECD, 2015). Typically, over 90% of government purchases are carried out by five autonomous institutions: the Costa Rican Electricity Institute (*Instituto Costarricense de Electricidad*), the National Road Council, the Costa Rican Department of Social Security (*Caja Costarricense de Seguro Social*), the Costa Rican Oil Refinery (*Refinadora Costarricense de Petróleo*) and the National Bank of Costa Rica (OECD, 2015). Hence, government purchases share with MNC purchases features of reliability and scale.[i] Once a firm is already pre-registered and pre–qualified, future contracts with the government are also more likely to occur. Surprinsingly, when we go to the data and study the features of first-time sales to the government, we find to be very similar to those of first-time sales to an MNC. The average

[i]The same argument is made in Ferraz, Finan, and Szerman (2016): the government is a more reliable payer than most private parties. This reliability gives vendors security that the terms of the contract will be respected, which encourages them to make the investments necessary to fulfill the contract.

(median) first transaction with the government is of 59,8K U.S. dollars (17.7K), whereas the average (median) first transaction with an MNC is of 56,7K U.S. dollars (11.9K). The lengths of these relationships are also very similar.

Table D1: TFP Estimation After Starting to Supply the Government

	Prod Index (1)	CD *K,L,M* (2)	TL *K,L,M* (3)	Prod Index (4)	CD *K,L,M* (5)	TL *K,L,M* (6)
4 years before event	-0.011	0.002	-0.016	-0.084*	-0.061*	-0.063*
	(0.024)	(0.020)	(0.019)	(0.049)	(0.035)	(0.032)
3 years before event	0.012	0.022	0.013	-0.018	-0.018	-0.023
	(0.022)	(0.016)	(0.014)	(0.038)	(0.023)	(0.025)
2 years before event	0.004	0.030***	0.012	-0.019	-0.007	-0.012
	(0.013)	(0.010)	(0.009)	(0.024)	(0.015)	(0.015)
Year of event	-0.020	0.024**	0.013	-0.002	-0.001	0.009
	(0.013)	(0.012)	(0.009)	(0.024)	(0.012)	(0.012)
1 year after event	-0.021	0.028**	0.021**	0.017	0.006	0.027
	(0.015)	(0.013)	(0.009)	(0.042)	(0.019)	(0.018)
2 years after event	-0.018	0.026**	0.015	0.038	0.021	0.045*
	(0.017)	(0.013)	(0.011)	(0.049)	(0.026)	(0.024)
3 years after event	-0.026	0.011	0.002	0.045	0.018	0.043
	(0.018)	(0.012)	(0.010)	(0.059)	(0.031)	(0.029)
4 years after event	-0.017	0.007	0.012	0.065	0.015	0.065
	(0.022)	(0.018)	(0.014)	(0.076)	(0.037)	(0.041)
Mean Dep. Var. (level)	0.92	1.66	1.66	0.86	4.26	4.26
SD Dep. Var. (level)	0.56	6.47	6.47	0.52	17.7	17.7
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	0.70	0.96	0.97	0.62	0.97	0.98
# Observations	86,232	86,232	86,232	7,122	7,122	7,122
# Fixed Effects	19,377	19,377	19,377	2,353	2,353	2,353
# Firms	13,304	13,304	13,304	895	895	895

Notes: Table D1 shows the results of running specification of equation (1) adapted to the same three measures of TFP defined for Table 4. The event is defined as a first time sale to the government. Columns (1)-(4) report event study estimates for the sample including both domestic firms that become first-time suppliers to the government after 2010 and domestic firms never observed as supplying the government during our entire firm-to-firm transaction data. Clustering of standard errors is at the 2-digit sector by province level. Columns (5)-(8) focus only on the sample of domestic firms becoming first-time suppliers to an MNC after 2010 and use standard error clustering at event by province level. Means (in levels) of sales (residualized in columns (1) and (4)) are reported in millions of U.S. dollars (CPI-deflated to 2013 U.S. dollars). Clustered standard errors in parentheses. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

In terms of process, government entities generally acquire their goods and services through public tenders, which are advertised in the official legal bulletin, *La Gaceta*, and other major newspapers. In 2010, the Costa Rican government created an electronic platform for

public procurement called Mer-Link.[ii] Mer-Link allows for a transparent search of both open and closed public tenders, with a detailed description of the product or service procured. All firms are evaluated in their ability to fulfill a given contract, with the details of the evaluation available for public consultation. This evaluation process has similar learning benefits to the evaluations carried out by Procomer in its "Productive Linkages" program and to audits carried out independently by MNCs prior to contracting a new supplier.

We propose here a new event-study, with the event defined as a first sale to the government. As before, data constraints require such a sale to occur between 2010 and 2015. To avoid overlapping treatments, we only preserve domestic firms that never supply an MNC. We continue to use the event-study design described in Section 3, altered only in the event of interest. We repeat for the restricted set of first-time suppliers to the government all regressions conducted for the restricted sample of first-time suppliers to an MNC. Those exercises using the full sample of first-time suppliers and never-suppliers to an MNC are replicated with the full sample of first-time suppliers and never-suppliers to the government.

Table D1 is analogous to Table 4, with the event and samples adapted to the current exercise. The new table exhibits significantly smaller and shorter-lived improvements in measures of TFP, which are not robust across samples and definitions of the dependent variable. These event-study findings motivate our exclusion restriction in the IV exercise described in Section 5.3, useful to estimate δ. See Section 5.2 for more details.

Online Appendix D.2 Instrumental Variable Strategy to Estimate δ

Table D2: Instrumental Variable Strategy for Estimation of δ

	(1) δ / (SE)	(2) First-Stage F	(3) # Observations
Full Sample	-0.217*	49.52	78,603
	(0.126)	–	–
Restricted Sample	-0.080	109.60	10,483
	(0.087)	–	–

Notes: Table D2 shows the results of the instrumental variable strategy described in Section 5.3. We estimate equation (5) by instrumenting the change in log total sales of supplier i at time t with a dummy variable indicating whether supplier i is awarded a procurement contract at time $t-1$ or not. We estimate this equation over two samples that both exclude suppliers to MNCs, in order to isolate the effect of starting to sell to the government. The "Restricted Sample" focuses on firms that start supplying the government in the period of our sample. The "Full Sample" also includes firms that never sell to the government over this period. Both regressions include firm fixed effects, as well as 4-digit sector×province×year fixed effects. Robust standard errors are clustered at the 2-digit sector×province level. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

[ii] To access the Mer-Link website, see here. Mer-Link coexists with another purchasing system, called CompraRed, but Mer-Link has grown into the dominating platform.

Table D3: Robustness of the Empirical Application of Result 1 to Different Values of δ

	$\delta=-0.22$ (1)	$\delta=-0.22$ (2)	$\delta=-1.2$ (3)	$\delta=-0.9$ (4)	$\delta=-0.6$ (5)	$\delta=-0.3$ (6)	$\delta=0$ (7)	$\delta=0.3$ (8)	$\delta=-1.2$ (9)	$\delta=-0.9$ (10)	$\delta=-0.6$ (11)	$\delta=-0.3$ (12)	$\delta=0$ (13)	$\delta=0.3$ (14)
4 years before event	0.004	-0.010	0.013	0.010	0.007	0.005	0.002	-0.000	-0.015	-0.014	-0.012	-0.011	-0.009	-0.008
	(0.009)	(0.025)	(0.014)	(0.013)	(0.011)	(0.010)	(0.008)	(0.007)	(0.032)	(0.029)	(0.027)	(0.025)	(0.024)	(0.023)
3 years before event	-0.003	-0.008	0.003	0.001	-0.001	-0.003	-0.004	-0.006	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
	(0.008)	(0.016)	(0.012)	(0.011)	(0.009)	(0.008)	(0.007)	(0.006)	(0.022)	(0.020)	(0.018)	(0.016)	(0.015)	(0.014)
2 years before event	-0.003	-0.005	0.002	0.001	-0.001	-0.002	-0.004	-0.006	-0.004	-0.004	-0.005	-0.005	-0.006	-0.006
	(0.006)	(0.008)	(0.009)	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)	(0.010)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)
Year of event	-0.031***	-0.016	0.001	-0.009	-0.019*	-0.029***	-0.039***	-0.048***	0.022	0.011	-0.001	-0.013	-0.024*	-0.036***
	(0.010)	(0.013)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.016)	(0.015)	(0.014)	(0.013)	(0.012)	(0.012)
1 year after event	0.038***	0.058***	0.101***	0.082***	0.062***	0.043***	0.024**	0.004	0.131***	0.108***	0.086***	0.063***	0.041**	0.019
	(0.011)	(0.019)	(0.014)	(0.013)	(0.012)	(0.011)	(0.011)	(0.010)	(0.024)	(0.022)	(0.021)	(0.019)	(0.018)	(0.017)
2 years after event	0.056***	0.082***	0.124***	0.103***	0.082***	0.061***	0.040***	0.019**	0.161***	0.137***	0.113***	0.088***	0.064***	0.040*
	(0.010)	(0.024)	(0.015)	(0.013)	(0.011)	(0.010)	(0.009)	(0.008)	(0.032)	(0.029)	(0.027)	(0.025)	(0.023)	(0.022)
3 years after event	0.054***	0.084**	0.121***	0.101***	0.080***	0.060***	0.039***	0.019**	0.159***	0.136***	0.113***	0.090***	0.067**	0.044
	(0.010)	(0.031)	(0.016)	(0.014)	(0.012)	(0.011)	(0.009)	(0.008)	(0.041)	(0.038)	(0.035)	(0.032)	(0.029)	(0.027)
4 years after event	0.055***	0.093**	0.120***	0.101***	0.081***	0.061***	0.041***	0.021**	0.167***	0.144***	0.122***	0.099**	0.076**	0.053
	(0.011)	(0.036)	(0.017)	(0.015)	(0.013)	(0.011)	(0.010)	(0.009)	(0.047)	(0.043)	(0.040)	(0.037)	(0.034)	(0.032)
Firm FE	Yes	Yes	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	Yes	Yes
Never Suppliers	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
# Observations	116,536	23,801	116,536	116,536	116,536	116,536	116,536	116,536	23,801	23,801	23,801	23,801	23,801	23,801

Notes: Table D3 shows the results of running specification (1) with the measure of *adjusted sales to others* as the dependent variable. For this table, total sales and sales to others use total sales values from corporate income tax returns data. For sales to others, we subtract from total sales those sales made to the first MNC buyer. Each column implements Result 1 for a different value of δ, as indicated above the column number. Columns (1) and (2) show our baseline findings for $\delta=-0.217$ and for the two samples (full and restricted) - this estimate of δ comes from the instrumental variable strategy described in Section 5.3 and implemented in Table D2. The rest of the columns show the robustness of our baseline findings to values of $\delta\in[-1.2,0.3]$. For $\sigma=6$, the corresponding values of $\gamma\in[0.76,1.06]$. Columns (3)-(8) report event-study estimates for the full sample including both domestic firms that become first-time suppliers to an MNC and never-suppliers. Clustering of standard errors is at the 2-digit sector by province level. Columns (9)-(14) focus only on the restricted sample of domestic firms that become first-time suppliers to an MNC and use standard error clustering at event by province level. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D4: Robustness of the Empirical Application of Result 1 to Different Values of δ - Transaction Data Only

	$\delta=-0.22$ (1)	$\delta=-0.22$ (2)	$\delta=-1.2$ (3)	$\delta=-0.9$ (4)	$\delta=-0.6$ (5)	$\delta=-0.3$ (6)	$\delta=0$ (7)	$\delta=0.3$ (8)	$\delta=-1.2$ (9)	$\delta=-0.9$ (10)	$\delta=-0.6$ (11)	$\delta=-0.3$ (12)	$\delta=0$ (13)	$\delta=0.3$ (14)
4 years before event	0.005	-0.029	0.012	0.010	0.008	0.005	0.003	0.001	-0.037	-0.035	-0.032	-0.030	-0.028	-0.025
	(0.019)	(0.031)	(0.033)	(0.029)	(0.025)	(0.020)	(0.016)	(0.013)	(0.041)	(0.037)	(0.034)	(0.032)	(0.030)	(0.028)
3 years before event	0.003	-0.021	0.008	0.006	0.005	0.003	0.002	0.001	-0.023	-0.023	-0.022	-0.021	-0.021	-0.020
	(0.010)	(0.021)	(0.016)	(0.014)	(0.012)	(0.011)	(0.009)	(0.008)	(0.029)	(0.026)	(0.024)	(0.022)	(0.020)	(0.019)
2 years before event	0.008	-0.005	0.017	0.014	0.012	0.009	0.006	0.004	-0.004	-0.004	-0.005	-0.005	-0.006	-0.006
	(0.007)	(0.010)	(0.011)	(0.010)	(0.009)	(0.008)	(0.007)	(0.006)	(0.015)	(0.013)	(0.012)	(0.010)	(0.009)	(0.008)
Year of event	-0.136***	-0.113***	-0.075***	-0.093***	-0.112***	-0.131***	-0.149***	-0.168***	-0.048***	-0.068***	-0.088***	-0.107***	-0.127***	-0.147***
	(0.019)	(0.015)	(0.022)	(0.021)	(0.020)	(0.019)	(0.018)	(0.018)	(0.018)	(0.017)	(0.016)	(0.015)	(0.015)	(0.015)
1 year after event	0.052***	0.080***	0.140***	0.113***	0.086***	0.059***	0.032***	0.005	0.176***	0.146***	0.117***	0.088***	0.059***	0.030
	(0.013)	(0.020)	(0.020)	(0.018)	(0.015)	(0.013)	(0.011)	(0.009)	(0.026)	(0.024)	(0.022)	(0.020)	(0.019)	(0.018)
2 years after event	0.084***	0.119***	0.174***	0.147***	0.119***	0.091***	0.064***	0.036***	0.219***	0.189***	0.158***	0.128***	0.097***	0.066***
	(0.015)	(0.026)	(0.021)	(0.019)	(0.017)	(0.015)	(0.013)	(0.011)	(0.034)	(0.031)	(0.028)	(0.026)	(0.024)	(0.023)
3 years after event	0.117***	0.160***	0.211***	0.182***	0.153***	0.125***	0.096***	0.068***	0.264***	0.232***	0.201***	0.169***	0.137***	0.105***
	(0.015)	(0.034)	(0.021)	(0.019)	(0.017)	(0.015)	(0.013)	(0.012)	(0.043)	(0.040)	(0.037)	(0.035)	(0.033)	(0.031)
4 years after event	0.109***	0.163***	0.195***	0.168***	0.142***	0.116***	0.090***	0.063***	0.263***	0.232***	0.202***	0.171***	0.141***	0.110***
	(0.014)	(0.042)	(0.019)	(0.017)	(0.016)	(0.014)	(0.013)	(0.012)	(0.053)	(0.049)	(0.046)	(0.043)	(0.040)	(0.038)
Firm FE	Yes	Yes	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	Yes	Yes
Never Suppliers	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
# Observations	63,078	20,491	63,078	63,078	63,078	63,078	63,078	63,078	20,491	20,491	20,491	20,491	20,491	20,491

Notes: Table D4 shows the results of running specification (1) with the measure of *adjusted sales to others* as the dependent variable. For this table, total sales and sales to others are based only on the firm-to-firm transaction data. Here, total sales are replaced by total corporate sales, i.e., the sum of all sales recorded by the firm-to-firm transaction data in a year. Also, sales to others are replaced by the sum of all sales recorded by the firm-to-firm transaction data, made to buyers other than the first MNC buyer. Each column implements Result 1 for a different value of δ, as indicated above the column number. Columns (1) and (2) show our baseline findings for $\delta=-0.217$ and for the two samples (full and restricted) - this estimate of δ comes from the instrumental variable strategy described in Section 5.3 and implemented in Table D2. The rest of the columns show the robustness of our baseline findings to values of $\delta\in[-1.2,0.3]$. For $\sigma=6$, the corresponding values of $\gamma\in[0.76,1.06]$. Columns (3)-(8) report event-study estimates for the full sample including both domestic firms that become first-time suppliers to an MNC and never-suppliers. Clustering of standard errors is at the 2-digit sector by province level. Columns (9)-(14) focus only on the restricted sample of domestic firms that become first-time suppliers to an MNC and use standard error clustering at event by province level. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D5: Robustness of the Empirical Application of Result 2 to Different Values of δ - Transaction Data Only

	$\delta = -0.22$ (1)	$\delta = -0.22$ (2)	$\delta = -1.2$ (3)	$\delta = -0.9$ (4)	$\delta = -0.6$ (5)	$\delta = -0.3$ (6)	$\delta = 0$ (7)	$\delta = 0.3$ (8)	$\delta = -1.2$ (9)	$\delta = -0.9$ (10)	$\delta = -0.6$ (11)	$\delta = -0.3$ (12)	$\delta = 0$ (13)	$\delta = 0.3$ (14)
4 years before event	0.008	-0.021	0.016	0.014	0.011	0.009	0.007	0.005	-0.028	-0.026	-0.024	-0.022	-0.019	-0.017
	(0.014)	(0.028)	(0.027)	(0.023)	(0.019)	(0.015)	(0.012)	(0.009)	(0.036)	(0.033)	(0.031)	(0.029)	(0.027)	(0.027)
3 years before event	0.004	-0.018	0.009	0.007	0.006	0.004	0.003	0.001	-0.020	-0.020	-0.019	-0.018	-0.018	-0.017
	(0.008)	(0.020)	(0.013)	(0.011)	(0.009)	(0.008)	(0.007)	(0.007)	(0.026)	(0.024)	(0.022)	(0.020)	(0.019)	(0.018)
2 years before event	0.007	-0.006	0.015	0.013	0.010	0.007	0.005	0.002	-0.004	-0.005	-0.005	-0.006	-0.006	-0.007
	(0.006)	(0.010)	(0.009)	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)	(0.013)	(0.012)	(0.011)	(0.010)	(0.010)	(0.010)
Year of event	-0.142***	-0.119***	-0.081***	-0.100***	-0.118***	-0.137***	-0.156***	-0.174***	-0.055***	-0.074***	-0.094***	-0.114***	-0.133***	-0.153***
	(0.017)	(0.014)	(0.020)	(0.019)	(0.018)	(0.017)	(0.017)	(0.016)	(0.016)	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)
1 year after event	0.006	0.035*	0.095***	0.068***	0.040***	0.013	-0.014	-0.041***	0.130***	0.101***	0.072***	0.043**	0.014	-0.015
	(0.011)	(0.018)	(0.018)	(0.016)	(0.013)	(0.011)	(0.009)	(0.008)	(0.022)	(0.021)	(0.019)	(0.018)	(0.018)	(0.018)
2 years after event	0.027**	0.063***	0.118***	0.090***	0.062***	0.035***	0.007	-0.021**	0.163***	0.132***	0.102***	0.071***	0.040*	0.010
	(0.013)	(0.023)	(0.019)	(0.017)	(0.015)	(0.013)	(0.011)	(0.010)	(0.030)	(0.027)	(0.025)	(0.024)	(0.022)	(0.022)
3 years after event	0.056***	0.098***	0.149***	0.120***	0.092***	0.063***	0.035***	0.006	0.202***	0.170***	0.138***	0.106***	0.074**	0.042
	(0.012)	(0.033)	(0.019)	(0.017)	(0.015)	(0.013)	(0.011)	(0.010)	(0.039)	(0.037)	(0.035)	(0.033)	(0.032)	(0.032)
4 years after event	0.047***	0.099**	0.133***	0.107***	0.081***	0.054***	0.028**	0.002	0.199***	0.168***	0.138***	0.107***	0.077*	0.046
	(0.012)	(0.039)	(0.016)	(0.015)	(0.013)	(0.012)	(0.011)	(0.011)	(0.047)	(0.044)	(0.042)	(0.040)	(0.038)	(0.038)
Firm FE	Yes	Yes	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	Yes	Yes
Never Suppliers	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
# Observations	63,078	20,491	63,078	63,078	63,078	63,078	63,078	63,078	20,491	20,491	20,491	20,491	20,491	20,491

Notes: Table D5 shows the results of running specification (1) with the measure of *average adjusted sales to others* as the dependent variable. For this table, total sales and sales to others are based only on the firm-to-firm transaction data. Here, total sales are replaced by total corporate sales, i.e., the sum of all sales recorded by the firm-to-firm transaction data in a year. Also, sales to others are replaced by the sum of all sales recorded by the firm-to-firm transaction data, made to buyers other than the first MNC buyer. The number of other buyers is the number of buyers recorded by the firm-to-firm transaction data, other than the first MNC buyer. Each column implements Result 2 for a different value of δ, as indicated above the column number. Columns (1) and (2) show our baseline findings for $\delta = -0.217$ and for the two samples (full and restricted) - this estimate of δ comes from the instrumental variable strategy described in Section 5.3 and implemented in Table D2. The rest of the columns show the robustness of our baseline findings to values of $\delta \in [-1.2, 0.3]$. For $\sigma = 6$, the corresponding values of $\gamma \in [0.76, 1.06]$. Columns (3)-(8) report event-study estimates for the full sample including both domestic firms that become first-time suppliers to an MNC and never-suppliers. Clustering of standard errors is at the 2-digit sector by province level. Columns (9)-(14) focus only on the restricted sample of domestic firms that become first-time suppliers to an MNC and use standard error clustering at event by province level. ***,**,* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Online Appendix D.3 Inferring γ and σ from DLW (2012)

Using the method of De Loecker and Warzynski (2012), we can infer σ and γ from the estimation of mark-ups and production function elasticities. By assuming a Cobb-Douglas production function specification, we estimate the returns to scale parameter (γ) and the mark-up of firms (μ). Under our CES assumption for the demand system, we then infer the elasticity of demand (σ) from the mark-up, since the mark-up is given by $\mu = \frac{\sigma}{\sigma-1}$.

Table D6: Inferred γ and σ from Method of De Loecker and Warzynski (2012)

	Labor (1)	Capital (2)	μ (3)	γ (4)	σ (5)	δ (6)	Obs (7)
All sectors (pooled)	0.84	0.08	1.25	0.92	5.03	-0.32	82,094
	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.02)	
Agriculture, forestry and fishing	0.68	0.09	1.12	0.77	9.20	-1.87	5,229
	(0.01)	(0.01)	(0.02)	(0.01)	(1.38)	(0.41)	
Manufacturing	0.88	0.08	1.19	0.96	6.21	-0.21	14,922
	(0.02)	(0.00)	(0.03)	(0.02)	(0.83)	(0.15)	
Wholesale and Retail Trade	0.81	0.08	1.25	0.88	4.98	-0.46	42,033
	(0.00)	(0.01)	(0.01)	(0.01)	(0.11)	(0.04)	
Transportation and Storage	1.00	0.04	1.57	1.03	2.74	0.06	1,375
	(0.11)	(0.06)	(0.18)	(0.12)	(1.98)	(0.43)	
Accommodation and Food Services	0.77	0.07	1.05	0.84	20.88	-3.23	9,280
	(0.04)	(0.01)	(0.05)	(0.03)	(8.46)	(1.53)	
Information and Communication	0.82	0.08	1.21	0.90	5.87	-0.48	896
	(0.16)	(0.06)	(0.25)	(0.14)	(24.62)	(5.24)	
Professional, Scientific and Technical	0.88	0.09	1.29	0.98	4.44	-0.08	3,432
	(0.01)	(0.01)	(0.02)	(0.02)	(0.30)	(0.06)	
Administrative and Support Service	0.88	0.05	1.21	0.93	5.80	-0.32	1,998
	(0.03)	(0.02)	(0.04)	(0.03)	(1.51)	(0.31)	
Human Health and Social Work	0.86	0.09	1.36	0.95	3.81	-0.14	861
	(0.18)	(0.06)	(0.29)	(0.16)	(7.61)	(1.79)	
Other Services	0.85	0.02	1.26	0.83	4.92	-0.68	1,275
	(0.18)	(0.08)	(0.31)	(0.17)	(13.84)	(4.17)	

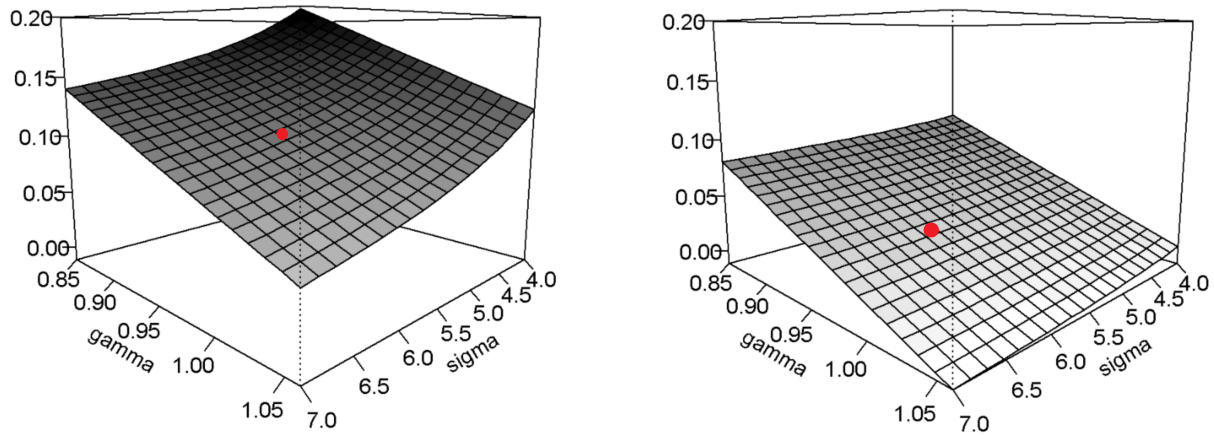
Notes: Table D6 shows results from the De Loecker and Warzynski (2012) methodology for the economy-wide sample, pooled across all sectors and separately by sector. Column (1) and (2) show the estimated input elasticities for labor and capital in a Cobb-Douglas value-added production function. Column (3) shows the mark-up (μ). Column (4) corresponds to the returns to scale parameter (γ), 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 mark-up over marginal cost given by $\mu = \frac{\sigma}{\sigma-1}$, which allows us to infer σ from our estimated μ. Column (6) computes the resulting value for $\delta = (\gamma - 1)(\sigma - 1)$. Finally, column (7) reports the number of observations. This methodology implies values of $\delta \in [-1.87, 0.06]$ across sectors. The estimation based on all sectors implies $\delta = -0.33$, which is close to $\delta = -0.22$ estimated with our IV strategy. Bootstrap standard errors are shown in parenthesis.

Using this approach we estimate an average mark-up across sectors of 1.25 (25% over marginal cost). This implies $\sigma = 5$, which is close to the value of 6 from Broda and Weinstein

(2006) that we use in our baseline findings. We also find returns to scale of the production function $\gamma = 0.92$. With these estimates in hand, we obtain $\delta = (\gamma - 1)(\sigma - 1) = -0.33$. This estimate of δ is close to the one obtained from the full sample using the IV methodology (see Table D2, Online Appendix D.2). Reassuringly, the findings from this approach are similar to our baseline findings. That said, this approach is not our first choice, since we aim to provide an alternative to the standard approach of production function estimation.

Online Appendix D.4 Robustness of Model-Based Results to γ and σ

Instead of estimating γ and σ ourselves (or taking a value of σ from the literature), we investigate here the sensitivity of our baseline model-based results to reasonable ranges of values for these parameters. Figure D5 presents the estimates of the model-based TFP according to either Result 1 or Result 2 for different calibrations of γ and σ. The two ranges considered include both of our preferred values of γ and σ (0.96 and 6, respectively, for $\delta = -0.22$) that deliver our baseline results in Table 6.



(a) Result 1, Composite TFP

(b) Result 2, TFP

Figure D5: Estimates of TFP for Different Values of σ and γ

Notes: Figure D5 presents the estimated changes in two measures of TFP (vertical axis): composite TFP (Panel D5a) and true TFP (Panel D5b), for different calibrations of the relevant parameters γ (returns to scale) and σ (elasticity of demand). These graphs are the empirical applications of Results 1 and 2. For comparability, they are both constructed using only sales to corporate buyers, from the firm-to-firm transaction data. The axis on the left considers values of γ between 0.85 and 1.05. The axis on the right considers values of σ between 4 and 7. The red dots correspond to our baselines estimates obtained from $\gamma = 0.96$ and $\sigma = 6$ (associated with $\delta = -0.22$).

Online Appendix D.5 Discussion of Assumption (a.ii)

In Section 5.2, assumption (a.ii) was key to our ability to separate intensive and extensive margin effects and reach Result 2. This assumption required that for any changes in ϕ and/or r experienced by the supplier, all buyers i equally adjust their probability to source from the supplier, i.e., $\text{dln}(n_i) = \text{dln}(n)$.

Let us now relax this assumption. Define $\omega_i = \frac{n_i b_i}{\sum_{k \neq MNC_0}^{N} n_k b_k}$ and $\omega_i' = \frac{n_i}{\sum_{k \neq MNC_0}^{N} n_k}$. Using the definition of $\varepsilon_{\widetilde{n}}$ (see equation (C7)) and taking the total derivative of $\ln(\widetilde{N})$, we obtain:

$$\begin{aligned}
\varepsilon_{\widetilde{n}} =& \mathbb{E}\left[\sum_{i \neq MNC_0}^{N} \mathrm{dln}(n_i)\omega_i\right] \\
\mathbb{E}\left[\mathrm{dln}(\widetilde{N})\right] =& \mathbb{E}\left[\sum_{i \neq MNC_0}^{N} \mathrm{dln}(n_i)\omega_i'\right] \\
\Rightarrow \varepsilon_{\widetilde{n}} =& \mathbb{E}\left[\mathrm{dln}(\widetilde{N})\right] + \mathbb{E}\left[\sum_{i \neq MNC_0}^{N} \mathrm{dln}(n_i) \times (\omega_i - \omega_i')\right]. \qquad \text{(D10)}
\end{aligned}$$

Equation (D10) tells us that, in the general case where $\mathrm{dln}(n_i)$ depends on the buyer i, $\varepsilon_{\widetilde{n}}$ and $\mathbb{E}\left[\mathrm{dln}(\widetilde{N})\right]$ need not be equal. Without assumption (a.ii) equation (C9) can be written as:

$$\mathbb{E}\left[\mathrm{dln}\left(\frac{p\widetilde{Q}/\left(pQ\right)^{\delta}}{\widetilde{N}}\right)\right] = (\sigma-1)\varepsilon_{\phi} + \mathbb{E}\left[\sum_{i \neq MNC_0}^{N} \mathrm{dln}(n_i) \times (\omega_i - \omega_i')\right] = (\sigma-1)\varepsilon_{\phi} + \tilde{\varepsilon}.$$

Whenever assumption (a.ii) does not hold, $\tilde{\varepsilon}$ is likely to add a bias to Result 2. The sign of $\tilde{\varepsilon}$ depends on the covariance between $\mathrm{dln}(n_i)$ and $(\omega_i - \omega_i')$. Given the definitions of ω_i and ω_i', we have that $(\omega_i - \omega_i') > 0$ if and only if $\sum_k (b_i - b_k)n_k > 0$. Thus, the sign of $\tilde{\varepsilon}$ would ultimately depend on the covariance between $\mathrm{dln}(n_i)$ and $\sum_k (b_i - b_k)n_k$. This covariance would be positive (negative) if the change in the probability of matching with a given buyer ($\mathrm{dln}(n_i)$) would be higher for buyers with bigger (smaller) demand shifters (b_i) than that of the average buyer. In summary:

$$\mathbb{E}\left[\mathrm{dln}\left(\frac{p\widetilde{Q}/\left(pQ\right)^{\delta}}{\widetilde{N}}\right)\right] \quad \begin{cases} > (\sigma-1)\varepsilon_{\phi} & \text{if } \mathrm{Cov}\left[\mathrm{dln}(n_i)\,,\, \sum_k (b_i - b_k)n_k\right] > 0 \\ < (\sigma-1)\varepsilon_{\phi} & \text{if } \mathrm{Cov}\left[\mathrm{dln}(n_i)\,,\, \sum_k (b_i - b_k)n_k\right] < 0 \end{cases} \qquad \text{(D11)}$$

Result 2 would provide an upper (lower) bound of the role of ϕ in interpreting our empirical findings if the first (second) case of equation (D11) were the relevant one to our context. We are now interested in investigating whether indeed all buyers i equally adjust their probability to source from the supplier, i.e., $\mathrm{dln}(n_i) = \mathrm{dln}(n), \forall i \neq MNC_0$. In our model, the only characteristic of buyers that differentiates them is their demand shifter b_i. We now ask whether $\mathrm{dln}(n_i)$ may be correlated with b_i. As we do not observe b_i directly, we use firm size as a proxy. Table A6 (Online Appendix A) shows that the average size of buyers increases after the event (column (2) for average employment and column (3) for average sales). This suggests that the probability of selling to buyers with higher than average demand shifters increased relatively more than the one of selling to buyers with lower than average demand shifters. The first case of equation (D11) is therefore more likely to apply to our setup. Hence, our model-based estimate of the increase in TFP may be an overestimate of the true increase.

Online Appendix E Summary Statistics for Main Sample

Table E1: Summary Statistics for the Firms in the Main Economy-Wide Sample

	N	Mean	S.D.	Median
Never Suppliers in 2009				
Total Sales	8,389	676.7	1,740.0	292.2
Number of Workers	8,389	11.6	28.7	6.0
Wage bill	8,389	79.0	299.7	31.8
Exports	201	891.1	1,430.5	246.4
Imports	1,268	207.2	619.9	48.4
Value Added	7,940	154.9	462.9	58.7
Input Costs	4,938	601.2	1,477.8	232.2
Total Net Assets	6,641	448.2	1,673.6	134.1
First-Time Suppliers in 2009 (Unbalanced)				
Total Sales	1,555	1,495.8	4,321.4	477.5
Number of Workers	1,555	19.5	45.1	7.8
Wage bill	1,555	131.5	311.6	47.3
Exports	111	742.8	2,131.0	57.0
Imports	454	567.9	1,863.2	111.3
Value Added	1,475	203.1	471.3	69.4
Input Costs	1,040	1,431.7	4,259.9	379.3
Total Net Assets	1,442	926.9	2,519.6	254.1
First-Time Suppliers in 2009 (Balanced)				
Total Sales	1,520	1,516.5	4,367.4	483.6
Number of Workers	1,520	19.6	45.3	7.9
Wage bill	1,520	132.7	314.4	47.5
Exports	110	749.5	2,139.5	57.8
Imports	446	574.4	1,878.5	113.7
Value Added	1,443	205.0	475.3	70.8
Input Costs	1,016	1,456.4	4,306.0	396.9
Total Net Assets	1,411	938.5	2,542.9	257.4

Notes: Except for the number of employees, all means, standard deviations, and medians are in thousands of CPI-deflated 2013 U.S. dollars. Statistics for each variable are calculated only across the firms with non-missing values for that variable that year. All values correspond to 2009, a year that is by construction prior to all events in the main economy-wide sample. Part of the firms in the overall main sample were not yet active in 2009, which explains the difference in the number of firms described in this table and the overall number of firms in the main economy-wide sample. The upper panel presents raw summary statistics for the sample of firms active in 2009 and never observed as supplying an MNC in our 2008 to 2017 firm-to-firm transaction data. The middle panel presents raw summary statistics for the sample of firms active in 2009 and observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. In 2009, there were 15,788 firms that satisfy our minimal size restrictions and that are split in three disjoint sets: 8,389 are never-suppliers (upper panel), 1,555 will become first-time suppliers sometime between 2010 and 2015, 5,844 are observed as already supplying an MNC in either 2008 or 2009. Firms observed as supplying for the first time an MNC after 2016 are dropped altogether from this calculation. The lower panel presents raw summary statistics for the sample of firms active in 2009, observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015, and observed at least one year before and after their event.

Table E2: Number of Events (First-Time Suppliers to MNCs) and MNCs Triggering Them

	Suppliers (Events)	MNCs (New, unique)	MNCs (Total, unique)
2010	761	263	263
2011	665	71	332
2012	646	43	372
2013	539	31	400
2014	517	19	421
2015	569	17	436
Total	3,697	444	

Notes: Table E2 describes the main economy-wide sample of firms observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. The second column reports the number of events that occur in each calendar year, or alternatively, the number of domestic firms that become first-time suppliers to an MNC that year. The third column reports the total number of new and unique MNCs that trigger an event in each calendar year, with the total showing the number of unique MNCs that we observe in the baseline sample. The fourth column shows the number of unique MNCs that trigger an event in each calendar year. Since MNCs may trigger events in multiple years, a total is not presented for this column. By definition, the values in the first row of the third and fourth columns are identical. The interpretation of the number 71 in the third column is the following: of the 332 unique MNCs that trigger the 665 events of 2011, 71 MNCs are new with respect to the 263 MNCs triggering events in 2010.

Table E3: Country of Global Ultimate Ownership for the MNCs Triggering the Event

Country of GUO	Frequency	Percentage
United States	209	47.1
Panama	28	6.3
Great Britain	18	4.1
Spain	17	3.8
Mexico	17	3.8
Switzerland	13	2.9
Colombia	13	2.9
Germany	11	2.5
France	11	2.5
Canada	10	2.3
...	...	...
Total	444	100

Notes: Table E3 documents the 10 most frequent countries of global ultimate ownership (GUO) for the MNCs triggering the events in our main economy-wide sample. Other origin countries are as follows: Japan (9 MNCs), Guatemala (8), Netherlands (8), El Salvador (8), Ireland (6), Venezuela (5), Belgium (4), China (4), and Nicaragua (4). Together they cover 403 of the 444 distinct MNCs. Each observation is a unique MNC. Since one MNC can trigger multiple events, the frequency of each country in the sample of unique MNCs is likely to differ from the frequency of each country in the sample of events (triggered by these MNCs).

Table E4: Sectoral Composition of the Sample of First-Time Suppliers and MNCs

	Suppliers	MNCs
Agriculture, Forestry and Fishing	7.91	7.82
Manufacturing	9.47	39.92
Wholesale and Retail Trade	35.11	19.31
Transportation and Storage	5.91	3.49
Accommodation and Food Services	15.93	6.22
Information and Communication	2.63	3.76
Professional, Scientific and Technical	8.56	3.52
Administrative and Support Service	6.85	7.68
Human Health and Social Work	2.93	0.73
Art, Entertainment and Recreation	1.50	0.46
Other Services	3.06	0.05
Mining and Quarrying	0.15	0.03
Water Supply, Sewerage and Waste Management	-	0.24
Construction	-	0.87
Real Estate	-	4.00
Education	-	1.89

Notes: Table E4 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. Both types of firms pertain to the main economy-wide sample.

Table E5: 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	62.40	18.59	110.31
Length of relationship with first MNC buyer	3,697	2.76	2.00	1.91
Length of relationship with all MNC buyers	3,697	3.69	3.00	2.11

Notes: Table E5 refers to all economy-wide domestic firms observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. The first line presents descriptive statistics of the first transaction with an MNC buyer. The second line describe 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 an MNC in 2015 we can observe only two years more of their firm-to-firm transactions.

Table E6: Number of Firms Still Supplying at Least 1 MNC Buyer in a Given Event Year

Calendar Year / Event Year	*0*	*+1*	*+2*	*+3*	*+4*	*+5*	*+6*	*+7*
2010	761	636	563	480	414	332	266	197
2011	665	549	453	383	335	273	211	
2012	646	525	430	353	290	223		
2013	539	446	360	304	235			
2014	517	397	327	252				
2015	569	407	316					
Total	3,697	2,960	2,449	1,772	1,274	828	477	197

Notes: Table E6 refers to all economy-wide domestic firms observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. The second column reports the distribution, by calendar year, of our events. By construction, in event year *0*, all firms that become a first-time supplier to an MNC have to appear in the calendar year row of their event year. Thus, by construction, the total number of firms in the column of event year *0* has to be 3,697. In the column of event year *+1*, we can trace how many of the firms who experience the event in a given calendar year are still selling to at least one MNC buyer one year after their event. The last column describes the number of firms that still supply MNCs seven years after their first sale to an MNC. As one can note, by construction, some cells are empty. For instance, we cannot observe firms that are first supplying an MNC in 2013 (hence have event year *0* as 2013) in event year *+5*, as our firm-to-firm does not allow us to observe those firms in 2018 (as our firm-to-firm dataset spans 2008 to 2017).

Table E7: Number of MNC Buyers in a Given Event Year

Event Year	Number of Suppliers (1)	Number of MNC Buyers Mean (2)	Median (3)	S.D. (4)
0	3,697	1.44	1.00	1.34
+1	2,960	1.92	1.00	2.02
+2	2,449	2.25	1.00	2.66
+3	1,772	2.62	1.00	3.32
+4	1,274	2.89	2.00	3.90
+5	828	3.15	2.00	4.38
+6	477	3.64	2.00	5.73
+7	197	4.02	2.00	7.02

Notes: Table E7 refers to all economy-wide domestic firms observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. For each event year *+k*, we show summary statistics of the number of MNC buyers (columns (2)-(4)) for domestic firms still supplying an MNC *+k* years later, as opposed to all firms still active *+k* years later (column (1)).

Table E8: Share of Total Sales Going to MNC Buyers in a Given Event Year

Event Year	N	Mean	Median	S.D.
0	3,697	0.19	0.06	0.27
+1	2,960	0.22	0.08	0.29
+2	2,449	0.23	0.10	0.29
+3	1,772	0.25	0.11	0.29
+4	1,274	0.25	0.11	0.29
+5	828	0.25	0.13	0.29
+6	477	0.26	0.14	0.29
+7	197	0.26	0.12	0.30

Notes: Table E8 refers to all economy-wide domestic firms observed as supplying for the first time an MNC in Costa Rica sometime between 2010 and 2015. For each event year *+k*, we show summary statistics of the share of total sales directed to MNC buyers for domestic firms still supplying an MNC *+k* years later (as opposed to all firms still active *+k* years later).

Online Appendix F Data Construction and Statistics

Online Appendix F.1 Administrative Data

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

Our first administrative dataset contains the universe of corporate income tax returns of active firms over the 2008 to 2017 period. Firms are corporations or individuals conducting business in Costa Rica. Every firm must file a yearly tax declaration called D-101 (*"Declaracion Jurada del Impuesto Sobre la Renta"* or the "Affidavit of Income Tax") to the Ministry of Finance of Costa Rica (*Ministerio de Hacienda*).[iii] This form contains information on profits, revenues, costs, assets, among others. Costs are reported into a few line items, which include, administrative cost (including wages), material inputs, capital depreciation, interest payments and other costs. Currently not filing the D-101 leads to payments of fines of up to 385 U.S. dollars, plus 11 to 12% annual interest on one's income tax liability. In addition, this dataset includes variables that come from the Costa Rican Social Security Fund (*"Caja Costarricense del Seguro Social"*), i.e., the number of employees, the wage bill, and the share of high-skill employees.[iv] Firms that report data to the Social Security at some point between 2008 and 2017 are considered active and kept in our datasets.

The information from these two primary sources is complemented with information on firm ownership and management from the Central Bank of Costa Rica (BCCR) and other

[iii] For instance, any individual renting real estate or providing professional services must comply with this requirement.

[iv] For the construction of this variable, a worker is defined as high-skilled if he/she earns more than the minimum wage paid to a worker with vocational post-high school training.

sources. BCCR identifies groups of firms that have common owners using data from the National Registry of firms, domestic and foreign surveys, and other public and private information. These groups of firms are called "grupo corporativo" or "corporate group." A "grupo empresarial" or "firm group" is a set of firms that not only share ownership, but also behave as one firm, meaning that one cannot consider them as separate business ventures.[v]

We add to the same firm group firms that belong to the same corporate group and also operate in the same sector as the firms in the firm group. Additionally, we use information from the Orbis and Amadeus databases from Bureau Van Dijk to improve our knowledge of firms that are related to each other.[vi] We expand our dataset with the tax returns of firms that lack social security data, if we learn that these firms are part of a corporate group.[vii]

For the purpose of our empirical analysis, we collapse the data and treat firm groups as one individual firm. We keep track of business relationships of all firms in the group with all other firms in the economy, but keep only one identifier for the group. We keep the fixed characteristics (identifier, sector, location) of the most relevant firm 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 keep the universe of domestic private firms that are part of the non-financial market economy. Therefore, we drop non-governmental organizations (NGOs), public entities (including utilities), and those observations that are registered as households. We drop data from the education sector and the construction / real estate sector,[viii] as well as firms related to the financial sector. 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 78,137 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, and we consider only 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). These restrictions leave us with 24,370 firms. Note that these 24,370 domestic firms include four types of firms: the never-suppliers (never supplying an MNC between 2008 and 2017), the first-time suppliers to an MNC sometime between 2010 and 2015, the always-suppliers (already supplying an MNC in either 2008 or 2009), and the first-time suppliers in either 2016 or 2017. Of these 24,370 firms, in the main economy-wide event-study, we only use the firms in the first two categories. In Table F1 we present descriptive statistics of the same eight variables from Table E1 for all firms in the non-financial market economy (upper panel) and for all 24,370 firms surpassing our minimal size restrictions (lower panel).

[v] Hypothetical firms A, B, and C owned by the same corporation operate in a way such that, in our data, some assets are owned by firm A, wages are paid by firm B, and firm C pays costs related to the whole operation, and all three firms behave as one for which the objective is to sell product z in Costa Rica.

[vi] These datasets are discussed in more detail in Online Appendix F.1.3.

[vii] For instance, this can include firms that report large revenues, but do not report any employees.

[viii] Most of these firms are active for one construction project only, disappearing immediately after being active for one or two years.

Table F1: Descriptive Statistics, All Domestic Firms Vs. Domestic Firms Kept After Minimal Size Restrictions

	# Firms	Mean	S.D.	Median
Domestic non-financial market economy				
Total Sales	78,137	495.1	3,114.9	118.3
Number of Workers	76,372	7.2	32.2	2.4
Wage Bill	76,650	53.4	300.7	12.6
Exports	4,487	451.7	2,804.2	23.6
Imports	21,521	224.1	1,579.7	13.8
Value Added	74,985	113.8	590.2	34.9
Input Costs	67,739	320.8	2,542.3	24.6
Total Net Assets	69,098	407.1	5,825.3	55.7
Domestic firms kept after min. size restr.				
Total Sales	24,370	1,242.1	5,345.5	380.1
Number of Workers	24,370	17.1	53.0	6.7
Wage Bill	24,370	135.6	497.3	42.3
Exports	2,846	546.5	3,361.0	13.7
Imports	9,195	439.3	2,333.3	22.0
Value Added	24,233	243.8	962.4	86.2
Input Costs	16,881	1,091.3	4,930.1	264.4
Total Net Assets	21,654	952.2	7,940.9	193.1

Notes: Table F1 reports summary statistics across 2008 to 2017 across eight variables for all firms in the non-financial market economy (upper panel) and for all firms kept in our sample of analysis (lower panel). With the exception of employment, the mean, standard deviation, and median are in thousands of U.S. dollars (CPI-deflated to 2013 dollars).

Table F2: Coverage of Data After Minimal Size Restrictions

Total Sales	78.6%
Number of Workers	81.7%
Wage Bill	84.2%
Exports	83.1%
Imports	89.3%
Value Added	76.2%
Input Costs	82.0%
Total Net Assets	73.5%

Notes: Table F2 presents the average coverage between 2008 to 2017 of the values for all firms kept after implementing our minimal size restrictions out the values for all firms in the non-financial market economy (across eight variables).

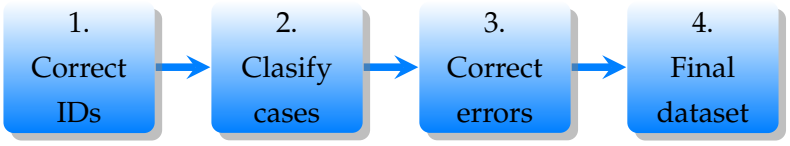
Despite losing more than two thirds of the firms, Table F2 shows that we keep those that employ most of the labor force and represent the largest share of sales, exports, income, costs and assets. For most variables, the firms we keep cover over 80% of the value across all firms in the non-financial market economy.

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

Our most important dataset allows us tracks all firm-to-firm relationships in Costa Rica between 2008 and 2017. This data is collected by the Ministry of Finance through the tax form D-151, the *"Declaración anual resumen de clientes, proveedores y gastos específicos"* (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 fee 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).[ix] Third-party reporting, of the type D-151 ensures, is used by the tax authority to identify firms that have not complied with their filing obligations, e.g. firms that have over-reported their costs or under-reported their revenues to reduce their profit tax liability. The tax authority uses different communication interventions, namely emails, phone calls, or personal visits, to follow up with non-filers (Brockmeyer, Hernandez, Kettle, and Smith, 2016). 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.

A sequence of steps was followed 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 steps can be summarized as follows:



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 require 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.

[ix] For the sale of professional services by individuals, the threshold is less than 100 U.S. dollars.

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 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 herafter:

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 amount of a pair of transactions was more than 20% or more than 50 millions of colones (close to 100,000 U.S. dollars), and one of the partners of the transaction reported a value of more than 500 millions of colones (close to 1 million U.S. dollars) careful manual checks were completed (using historical data to identify the correct value).[x]

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

Tables F3 and F4 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

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

already considered in the data. Finally, the smallest set of transactions includes those that were excluded due to being mistakenly reported.[xi]

Table F3: Number of Cases, Firm-to-firm Transaction Data

	2008		2012		2015	
Type of case	Count	%	Count	%	Count	%
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 F4: Value of Transactions, Firm-to-firm Transaction Data

	2008		2012		2015	
Type of case	Value	%	Value	%	Value	%
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 of CPI-deflated 2013 U.S. dollars.

[xi] 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.

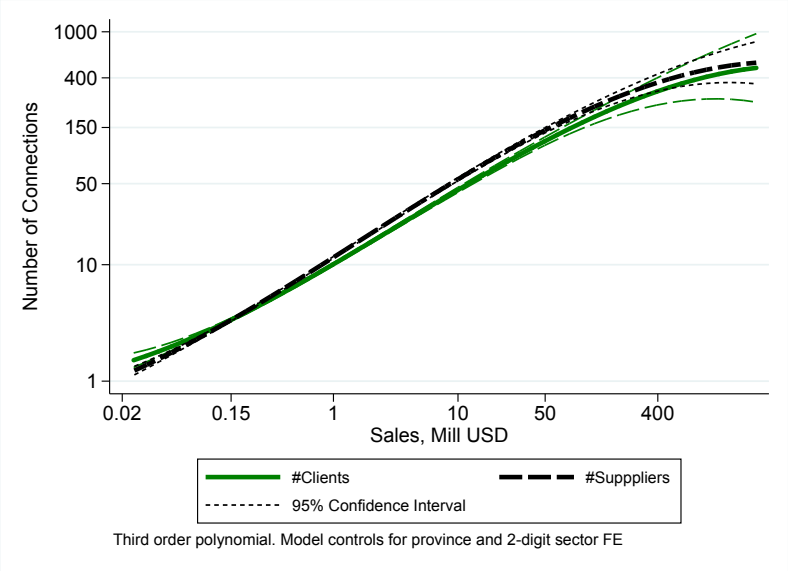


Figure F6: Size, In-degree and Out-degree

Notes: The figure shows the third degree polynomial regression of firm-level log number of buyers and suppliers (vertical axis) on log sales (horizontal axis) after controlling for year, 4-digit sector and province fixed effects. The two lines represent the number of buyers and the number of suppliers as separate regressions, along their respective 95% confidence interval.

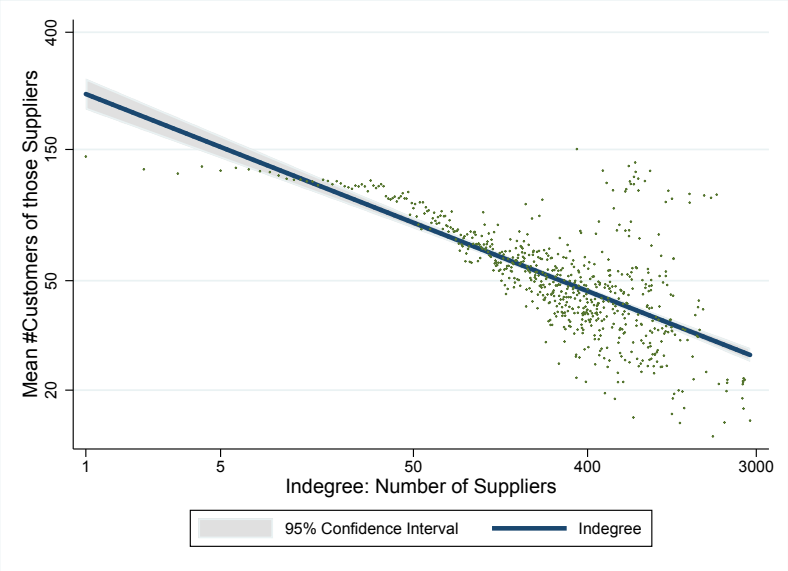


Figure F7: Degree Assortativity for Costa Rican Suppliers

Notes: The horizontal axis shows the number of suppliers for each Costa Rican firm and vertical axis shows the average number of buyers of those suppliers.

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. After a few years, 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.

Descriptive statistics of our database show that the behavior of the Costa Rican production network is similar to that of the production network of other countries. For example, Bernard, Moxnes, and Saito (2019) document that larger firms in the Japanese production network have more suppliers, and that there is a negative degree assortativity between sellers and buyers. Both facts are observed in our data as well, as shown in Figures F6 and F7.

As mentioned at the beginning of Section 3.1, we only consider "first-time supplying 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.[xii] 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 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 mandatory electronic filing). We stop with 2015 to be able to observe each firm at least two years after its event.

Online Appendix F.1.3 Foreign Ownership Data

In Costa Rica, there is no centralized and exhaustive reporting of the country of origin of firms' capital. To overcome this data limitation, we combine information from various sources.

Our first source is the reporting of firms that are active under the Free Trade Zone (FTZ) regime. Costa Rica has followed a strategy of pursuing FDI investment by offering benefits to firms established in FTZ regimes. As summarized in OECD (2017), 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 8 years and provides a 50% corporate income tax reduction during the following 4 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

[xii] This is likely to explain the lower data coverage for 2008 that we report in Tables F3 and F4.

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 a private, non-profit organization that started its operations in 1982. CINDE has mediated the entry of more than 300 foreign-owned firms in Costa Rica, such as Intel, Procter&Gamble, Hewlett Packard, or St. Jude Medical.[xiii] 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 Economico*, or the "Economic Study": when Costa Rica 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 belonging to Bureau Van Dijk.[xiv] We queried Orbis for all MNCs (*Global Ultimate Owners* in Orbis nomenclature) that have a presence (affiliate or branch) in Costa Rica, identifying the names and IDs of firms in Costa Rica and abroad, including intermediate ownership. As mentioned in Online Appendix F.1.1, Orbis allowed us to expand our knowledge of firm and corporate groups in Costa Rica. Orbis was also used to identify which of the foreign-owned firms in Costa Rica are actually part of an MNC group and which ones are single location firms. For foreign firms for which this information was not available in Orbis, we carried out extensive manual searches.

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 apply the same criteria used in Online Appendix F.1.1. 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

[xiii] 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.

[xiv] 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).

ownership, we arrive to 2,171 firm groups that are part of a corporate group with at least partial foreign ownership (see Online Appendix F.1.1 for details on the difference between firm groups and corporate groups).

As motivated in Section 2.2, not all of these 2,171 firm groups are suitable for our analysis. Out of these 2,171 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, 2017).

In Table F5 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 F1. 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 2,171 firms part of a corporate group with partial foreign ownership – these 622 MNCs are actually responsible for most of the foreign activity in Costa Rica. Table F6 presents totals adding up values for all

firms part of the non-financial market economy, domestic- and foreign-owned alike. Columns (B) and (C) present the percentage of those values that are accounted for by firms part of a corporate group with partial foreign ownership and (large) MNCs, respectively. The last column shows that for most of the variables, the MNCs that we use for our empirical exercises account for over 75% 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 F5: Descriptive Statistics by Firm Ownership

	# Firms	Mean	S.D.	Median
Fully domestic firms				
Total Sales	78,137	495.1	3,114.9	118.3
Employment	76,372	7.2	32.2	2.4
Wage bill	76,650	53.4	300.7	12.6
Exports	4,487	451.7	2,804.2	23.6
Imports	21,521	224.1	1,579.7	13.8
Value Added	74,985	113.8	590.2	34.9
Input Costs	67,739	320.8	2,542.3	24.6
Total Net Assets	69,098	407.1	5,825.3	55.7
Firms part of corporate groups with partial foreign ownership *Excluding (Large) MNCs*				
Total Sales	1,549	7,863.3	65,002.5	1,042.5
Employment	1,538	51.6	353.5	13.2
Wage bill	1,539	634.2	3,905.0	158.8
Exports	544	1,933.1	9,343.1	73.8
Imports	1,037	1,936.1	7,151.8	117.1
Value Added	1,527	1,778.3	12,939.6	298.8
Input Costs	1,453	5,477.5	52,538.1	236.1
Total Net Assets	1,533	8,222.8	45,932.0	969.1
(Large) MNCs				
Total Sales	622	42,746.4	10,3204.9	12,205.1
Employment	622	380.7	882.3	170.0
Wage bill	622	5,093.2	10,282.1	2,228.8
Exports	473	19,458.7	88,196.7	1,689.2
Imports	606	14,738.3	70,525.4	1,522.7
Value Added	621	12,561.7	52,734.4	3,956.0
Input Costs	601	24,510.0	59,848.6	4,084.2
Total Net Assets	619	40,518.1	81,037.5	10,450.4

Notes: 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.

Table F6: MNC Sample Coverage

	(A) Total	(B) All firms part of corporate groups w/ partial foreign owner.	(C) (Large) MNCs	(C)/(B)
Total Sales	77,450.5	50.1%	34.3%	68.6%
Number of Workers	868.5	36.4%	27.3%	74.9%
Wage Bill	8,236.4	50.3%	38.5%	76.4%
Exports	12,282.4	83.5%	74.9%	89.7%
Imports	15,762.3	69.4%	56.7%	81.6%
Value Added	19,050.5	55.2%	40.9%	74.2%
Input Costs	44,417.2	51.1%	33.2%	64.9%
Total Net Assets	65,819.0	57.3%	38.1%	66.6%

Notes: Number of workers in thousands. All other variables are in millions of CPI-deflated 2013 U.S. dollars. These statistics are averages across 2008 to 2017.

Table F7: 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
Chile	15	2.41	73.63
Netherlands	15	2.41	76.05
Germany	14	2.25	78.30
France	14	2.25	80.55
Canada	13	2.09	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 F7 reports the countries of global ultimate ownership (GUO) that correspond to at least 7 of the 622 MNCs in the final sample. 53% of MNCs have the United States as their country of GUO.

Online Appendix F.2 Procomer "Productive Linkages" Data

Online Appendix F.2.1 Data Cleaning and Sample Construction

We were granted access to the records of Procomer (the Trade Promotion Agency of Costa Rica) that track its implementation of "Productive Linkages:" a matchmaking program between MNCs and domestic firms. 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-Technology MNCs." The program has since undergone several changes to its name (*Costa Rica Provee* or *"Costa Rica 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.[xv] This allows us to consider matches mediated by Procomer since 2001 as receiving a similar treatment.

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

1. Carefully 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).

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 had successfully mediated 1,985 deals between 2001 and 2016. For all deals, we observe the buyer and winning supplier, the year the deal was made, 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.

The archived emails allowed us to reconstruct the shortlists for which there was no centralized record. Whenever there was no systematic archiving of the shortlists shared by Procomer with MNCs, we re-constructed them with the help of Procomer staff, by applying the

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

[xvi] Despite an exhaustive search, we were not able to find the tax ID of two of these firms. For obvious reasons, these firms and the deals they participated in cannot be used in the analysis.

rules originally used to generate them.[xvii]

We add 1,149 evaluations undertaken by Procomer between 2004 and 2015. Each evaluation involves a firm visit from a Procomer assessor and a detailed survey. Recent surveys are organized around five modules: productive capacity, market capacity, cooperation, R&D capacity, and quality.[xviii] 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, quality management requirements for organizations producing medical devices and related services). The cooperation module asks whether the firm has employees able to negotiate in the language relevant to the market it targets.

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 here ("Productive Linkages" or *Linkage,* as abbreviated by Procomer) is one option of follow-up. Figure F8 provides an anonymized example of the actual summary of an evaluation of a firm manufacturing plastic bags.

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.

Before setting the final set of rules that define the sample for the "winner vs. losers" 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 G). The main takeaway from these interviews was that in order to implement a clean "winner vs. losers" design, one had to study only deals meeting several strict criteria.

First, 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. For this reason, we only consider the first such deals. To be precise, for firms that are only matched in one year by Procomer we keep all deals occurring that year. For firms

[xvii] 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 prior to the deal and, hence, have a *Procomer score*. "Productive Linkages" only considered shortlists of up to five candidates. Shortlists could contain less than five candidates in cases in which (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 needed supplying sector. In sum, for each deal, we use up 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.

[xviii] While the structure of the survey evolved across time, there is considerable continuity in the themes covered.

with deals in several years, we only keep the deals occurring in the first year.

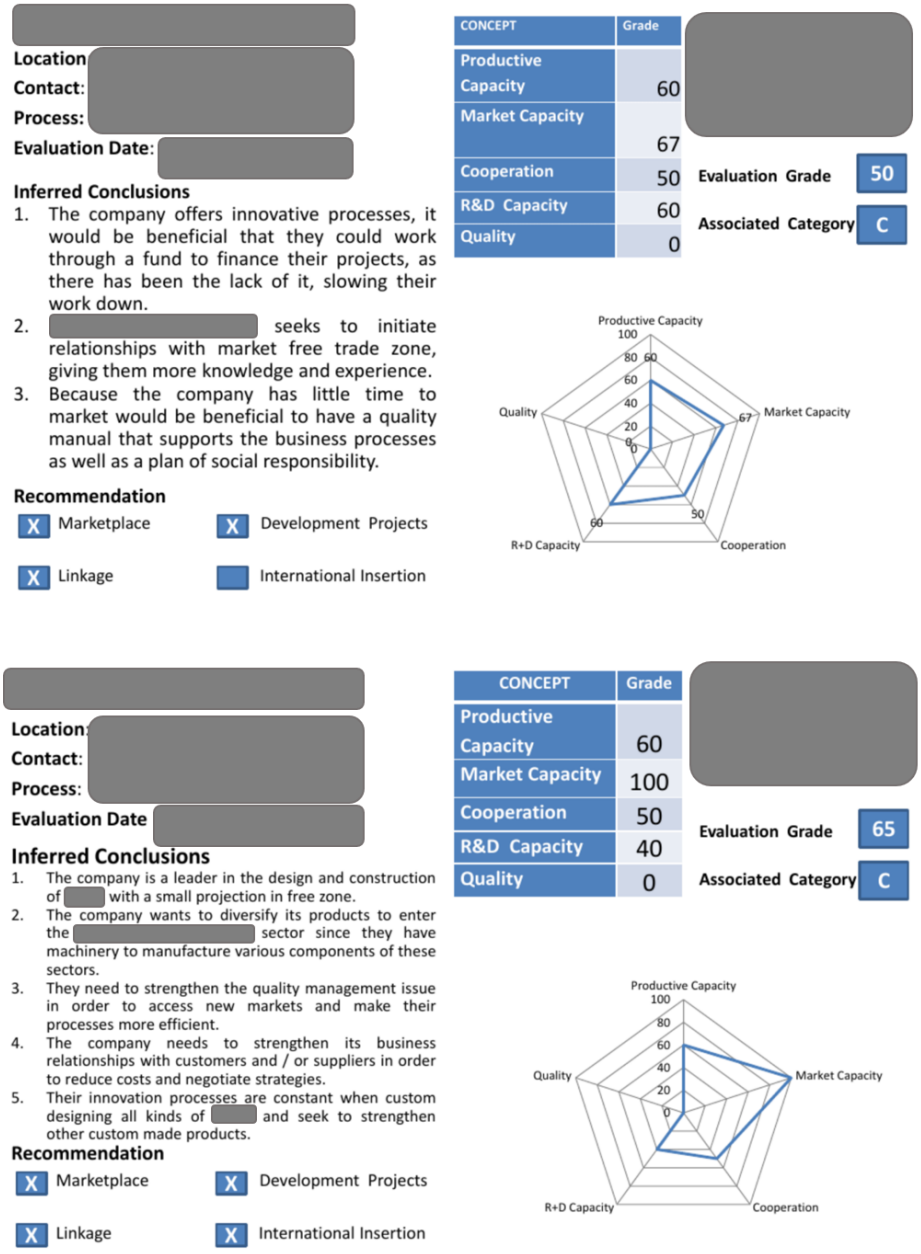


Figure F8: Anonymized Summary Sheets of the Evaluations of Two Domestic Firms

Notes: The two figures above are anonymized summary sheets of two actual Procomer evaluations. Each summary sheet is based on a survey asking detailed questions on each of the five modules appraised by Procomer: productive capacity, market capacity, cooperation, R&D capacity and quality. 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, quality management requirements for organizations producing medical devices and related services). The cooperation module asks whether the firm has employees able to negotiate in the language relevant to the market it targets. Each evaluation is concluded with an absolute score, a letter grade category based on the range of the absolute score and recommendations on which Procomer program the firm is fit to benefit from. The "Productive Linkages" program is one option of follow-up. The top summary sheet belongs to a firm that seeks to initiate business relationships with MNCs in a Free Trade Zone (FTZ), with the hope of acquiring knowledge and experience. The bottom summary sheet pertains to a firm diagnosed as having to make its processes more efficient; Procomer assesses that this boost in efficiency can be obtained through stronger buying and selling relationships [..with MNCs part of the FTZ].

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 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. Allow them in the sample would obscure the interpretation of the behavior of winner outcomes relative to losers' outcomes.

Last, 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 these restrictive conditions leaves us with 31 events that involve 31 distinct domestic winners, 84 domestic losers (of which 51 distinct),[xix] and 53 distinct MNCs triggering these 31 events.

Online Appendix F.2.2 Descriptive Statistics of Final Sample

In this section we present descriptive statistics on the Procomer sample of analysis. Table F8 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. Such situations granted opportunities to smaller firms to win those MNC deals.

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 (to draw the attention of MNCs to their preferred candidates). Figure F9 plots the rela-

[xix] One might be concerned that the fact that some firms may belong to several shortlists is driven by Procomer staff trying to promote those firms against their merit. From interviews with Procomer staff, domestic firms, and MNCs we concluded this concern is most likely not justified for two reasons. First, MNCs were not obliged to purchase from any given supplier proposed by Procomer or to even purchase through Procomer to begin with. If a supplier did not meet the needs of the MNC, that supplier would not be chosen. 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.

tionship 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.

Table F8: Comparison Between Winners and Losers in Year Before Deal

	Winners (1)	Losers (2)	Difference (3)
Employment	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	64.82	-12.67
	(42.60)	(76.89)	(14.60)
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)
# Winners	31	-	-
# Losers	-	84	-

Notes: Table F8 presents summary statistics describing winners and 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.

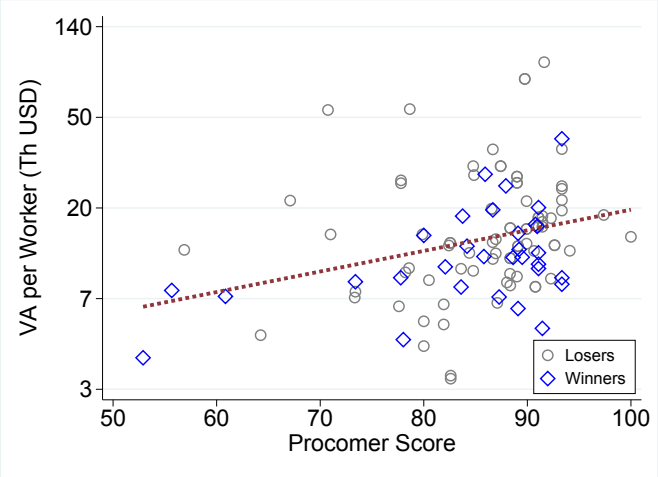


Figure F9: Relationship between Procomer Score and Value Added Per Worker

Notes: Figure F9 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.

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.

Table F9 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 E5 in Online Appendix E).

Table F9: 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 F9 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.

Figure F10 plots the frequency of shortlists containing two, three, four, and five candidates in the sample of "Productive Linkages" deals used in the analysis. Most shortlists proposed to MNCs contained four candidates.

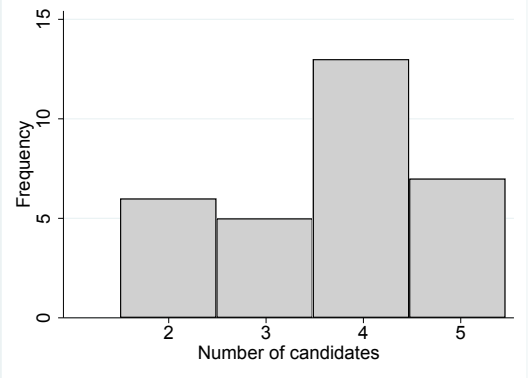


Figure F10: Distribution of Shortlist Length for Sample of Deals

Notes: Figure F10 plots the frequency of shortlists containing two, three, four, and five candidates in the sample of "Productive Linkages" deals used in the analysis.

Online Appendix G Surveys

Online Appendix G.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), that is, 762 domestic firms. Second, we targeted *all* the winning firms in the "winner vs. losers" Procomer sample (31 firms). Last, we targeted *all other* domestic firms that started supplying 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).[xx]

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

We decided to apply the long version of the survey to the firms involved in the "winner

[xx] 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.

[xxi] All three entities frequently survey firms in Costa Rica.

[xxii] Procomer contacted domestic suppliers and MNCs 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.

vs. losers" 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.

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).[xxiii]

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 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

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

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.

Online Appendix G.2 Survey Response Rate and Representatives

In Table G1 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

Table G1: 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 (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 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).

Recall that the same MNC can trigger events in all three samples. Overall these 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 keep for analysis.

Out of the 762 targeted domestic firms and their associated economy-wide events, we have a response rate of 4%.[xxiv] 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

[xxiv] 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.

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 total 4,198 the events (4,198=3,813+31+354) of interest, we have information from either the supplier or the MNC buyer for 834 (834=650+24+160) events, that is, for 20% of events.

Table G2: 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 G2 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. Last, 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 G3 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 G3: 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 G3 compares the domestic firms who have participated in our survey to the domestic firms who 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.

*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

From Table G3 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 G4 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 G4: Comparison Between Surveyed and Not Surveyed MNCs in Terms of Size, Performance, and Free Trade Zone Status

	Surveyed	Not surveyed	Difference
Number of Workers	561.4	408.2	153.2
	(874.28)	(923.49)	(131.26)
Total Sales	108.4	43.35	65.01***
	(280.76)	(76.15)	(16.75)
Value Added Per Worker	74.75	47.83	26.93
	(131.98)	(166.10)	(23.26)
Free Trade Zone	0.564	0.408	0.156*
	(0.50)	(0.49)	(0.07)

Notes: Table G4 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 Costa Rica. 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.

*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

Table G4 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. While they also seem to hire more workers and have a higher value added per worker, these two differences are not statistically significant. These findings reflect the fact that our most reliable contacts of MNCs came from CINDE and Procomer, who work closely with MNCs in Free Trade Zones. MNCs in Free Trade Zones tend to be larger and more sophisticated. Given our topics of interest, it is unclear how this affects the representativeness of their answers. Last, by comparing Tables E3 and G13 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 G.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 G.3.1 Survey Answers from Domestic Firms

Table G5: 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 version: both long and short (N=106). Responses are summarized in Table G5.

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.

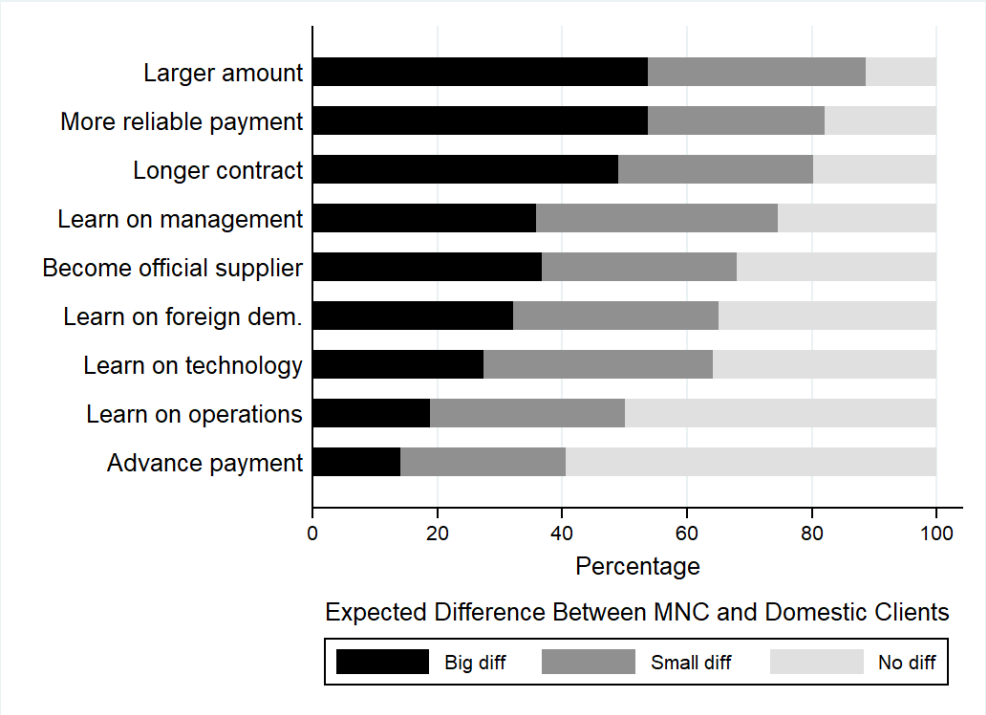


Figure G11: Question 3: Before the first contract with an MNC, how did your firm expect MNCs buyers to be different from domestic buyers?

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 MNCs 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 version: both 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 knowl-

edge," "...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 Costa Rica, but also for affiliates in other countries."

Figure G11 summarizes the answers to Question 3.

Question 4: "Before the first contact with a multinational in Costa Rica: 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 the multinationals" or "No, our firm did not take special measures to start supplying the multinationals." Survey section: "On special preparations before establishing a relationship with multinationals in Costa Rica." Survey version: both long and short (N=106).

47 domestic firms chose the negative answer (44%) and 59 domestic firms chose the positive answer (56%).

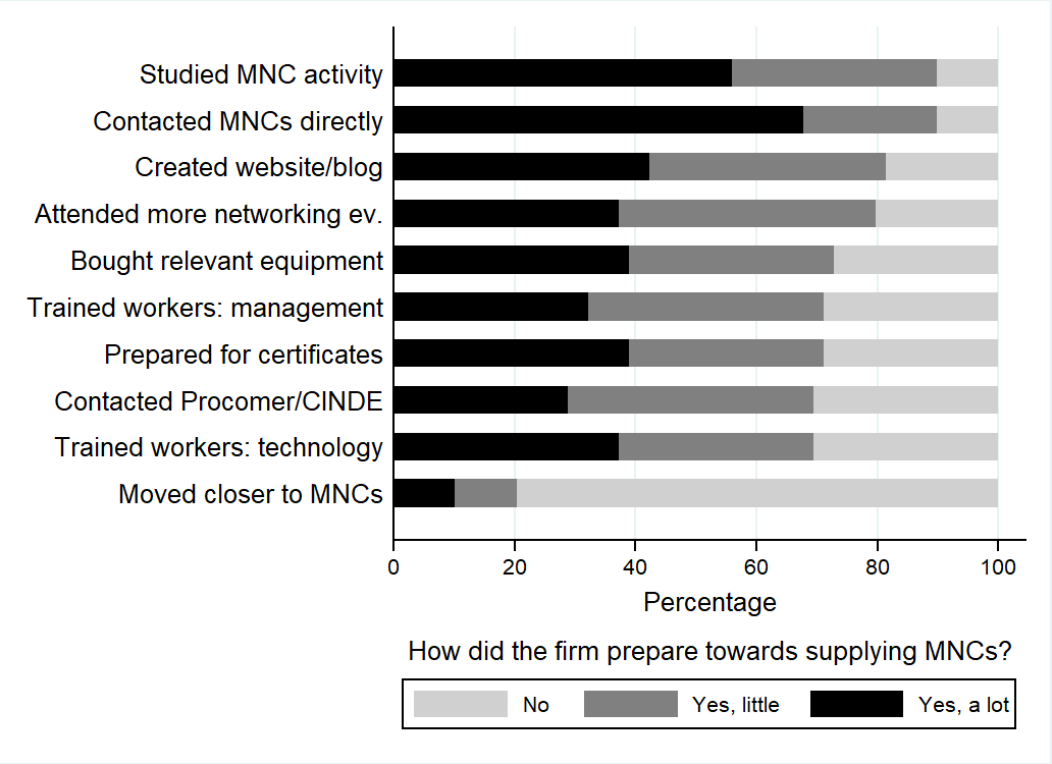


Figure G12: Question 5: How did your firm prepare to supply multinationals?

Notes: This graph summarizes the answers of 59 domestic firms to the survey question "How did your firm prepare to supply 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 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: Question: "How did your firm prepare to supply 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 multinationals," "... trained its workers on administrative or management practices relevant to supplying multinationals," "...began preparing for certifications that were relevant to supplying multinationals," "... bought machinery that potentially necessary to supplying 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 G12 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 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 version: both long and short (N=106)

100 domestic firms (94.3%) answered negatively (variations of "N/A", "No", "No change"). 6 domestic firms (5.7%) 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 multinational buyers" or "YES, we faced difficulties in trying to start supplying multinational buyers." Survey section: "Possible difficulties when trying to establish the first contracts with multinationals." Survey version: both 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 version: both 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 G13 summarizes the findings from Question 8.

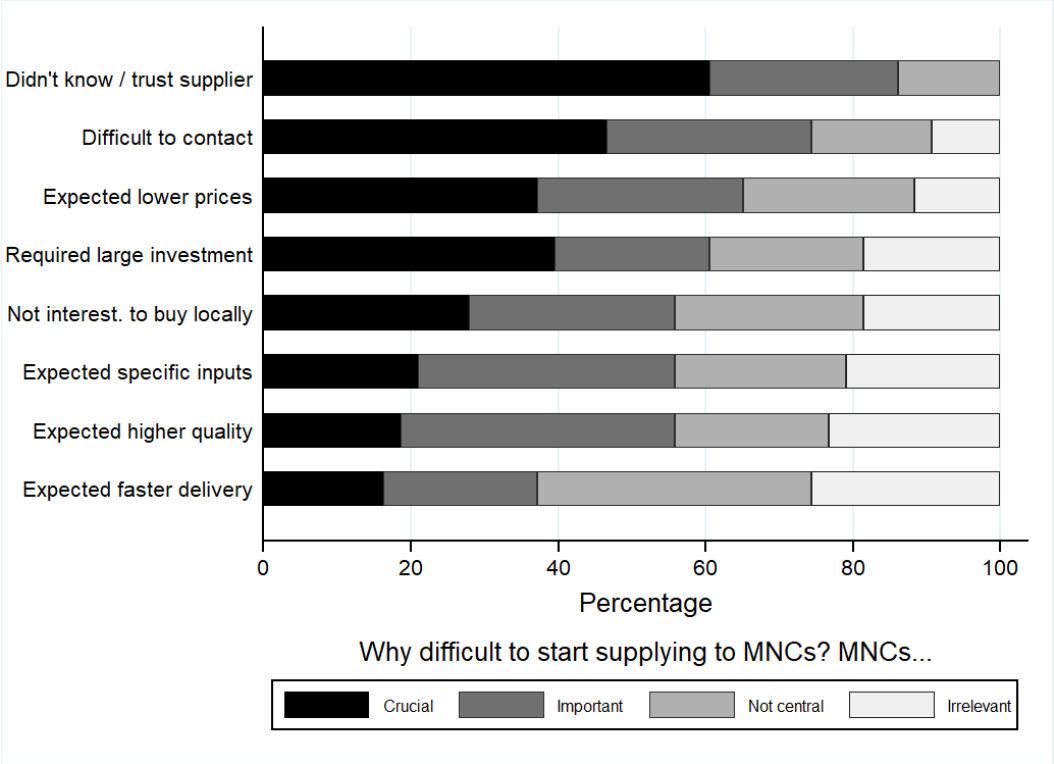


Figure G13: Question 8: Why was it difficult to get a first contract with a multinational?

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 version: both 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 G14 summarizes the answers to Question 9.

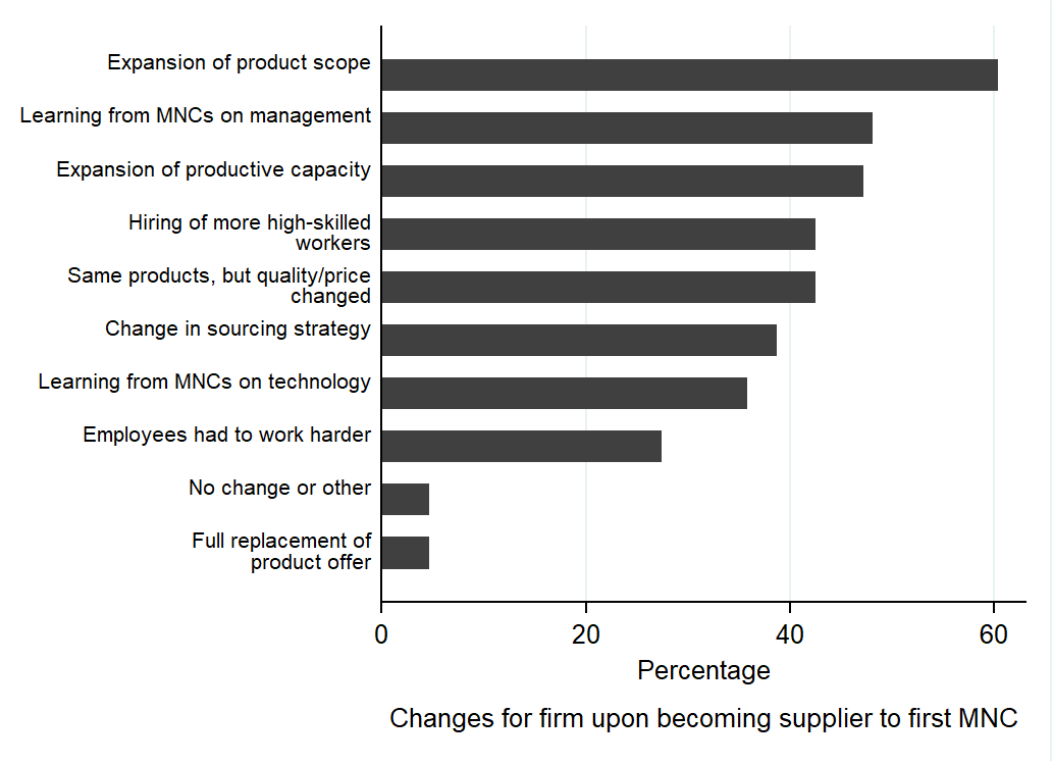


Figure G14: Question 9: What were the changes that the firm experienced when becoming a supplier to its first MNC buyers? Select all the answers that are TRUE.

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 version: both long and short (N=106).

Answers to this question were unguided, hence in order to be summarized had to analyzed and grouped by main topic. Table G6 summarizes the most frequent changes.

Table G6: 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.

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 version: both 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 the multinational," "The multinational had standardized training programs that 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 G15 summarizes the answers to this question.

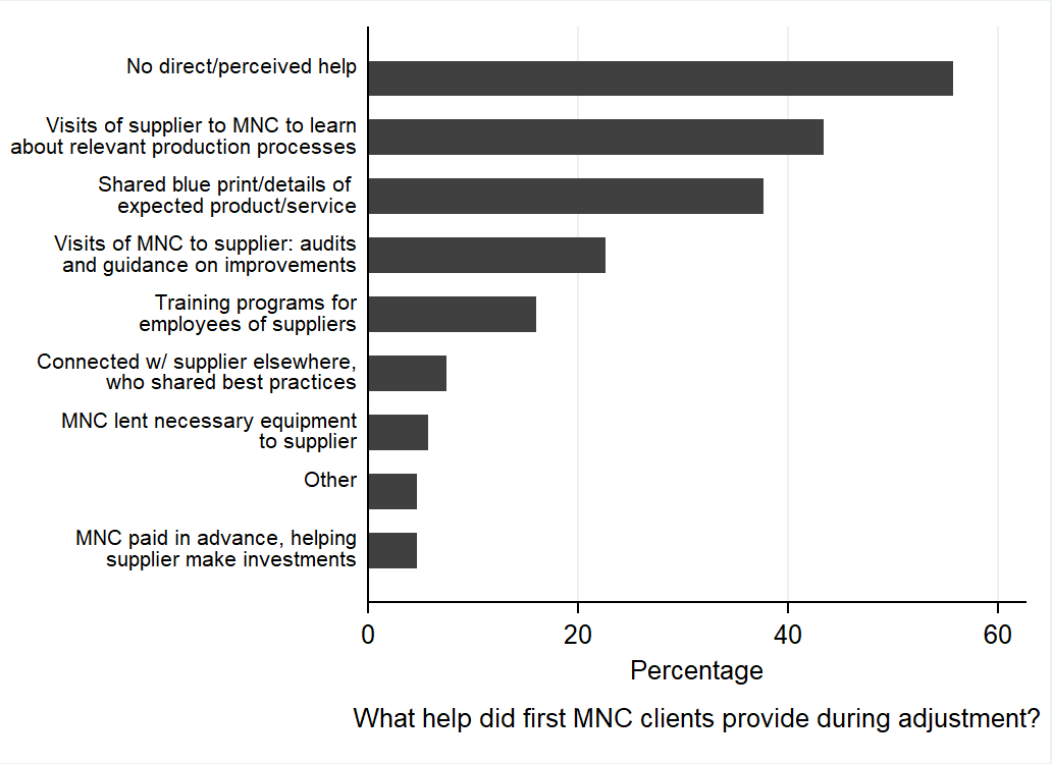


Figure G15: Question 11: How did the first MNC buyers help the firm to undergo these changes?

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 version: both 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 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 version: both long and short (N=106)

Table G7 summarizes the answers to Question 13.

Table G7: 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.

We have already provided an example of one such situation in Section 4. Hereafter, we

present two other examples.

> When we started supplying 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 G8 summarizes the choices made by the 91 domestic firms to Question 15.

Table G8: 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 G9: 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, lower 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 version: both long and short (N=106). Section: "Relationships with other types of buyers."

Table G9 reports the findings from this question. First, we group choices in three broad categories: "No. No Impact" (option 1), "Yes. Sold Less" (options 2 to 4), and "Yes. Sold More" (options 5 to 9). While 5 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 version: both 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 G10: 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 version: both 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 G10 summarizes the answers to Question 18.

Question 19: "How many of the deals of your firm with multinational buyers in Costa Rica 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 G11 summarizes the answers to Question 19.

Table G11: Question 19: How many of the deals of your firm with multinational buyers in Costa Rica 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 Costa Rica 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 G12 summarizes the answers to Question 20.

Table G12: 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."

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 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. Last, 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 G.3.2 Survey Answers from Multinational Firms (MNCs)

Table G13: 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 1: "Country where the headquarters of the multinational is." Question type: open-ended. Survey version: both long and short (N=58). Responses are summarized in Table G13.

Question 2: "Your position (job title) in the multinational." Question type: open-ended. Survey version: both long and short (N=58). Responses are summarized in Table G14.

Table G14: 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 Costa Rica? 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 Costa Rica." Question type: Likert-type scale. Survey version: both long and short (N=58). Section: "General questions about the multinational's incentives to invest in Costa Rica."

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 Costa Rica and the HQ country," "The distance between Costa Rica 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 Costa Rica, necessary for the production of the multinational."

Figure G16 summarizes the findings from Question 3.

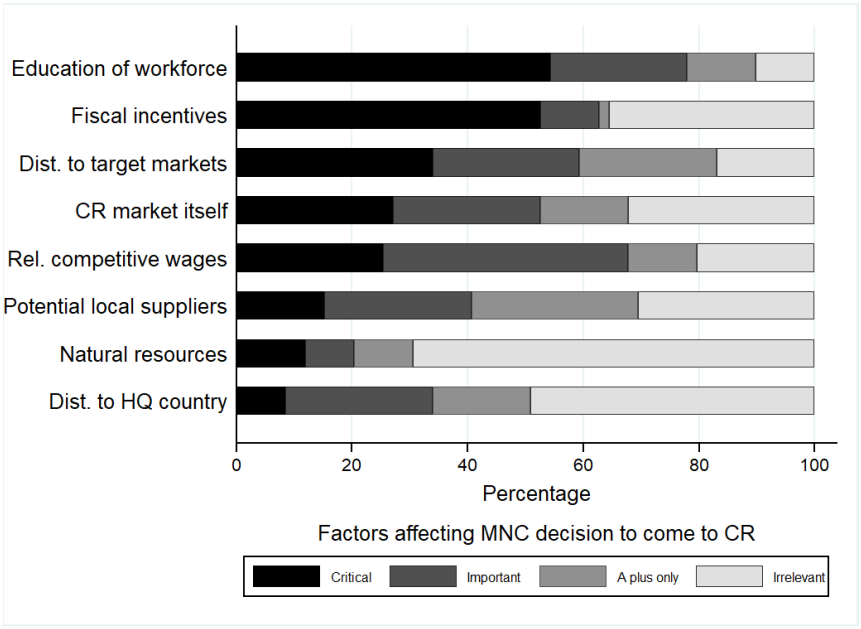


Figure G16: Question 3: How Important Were the Following Factors in the Decision of the Multinational to Locate Itself in Costa Rica?

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 Costa Rica? 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.

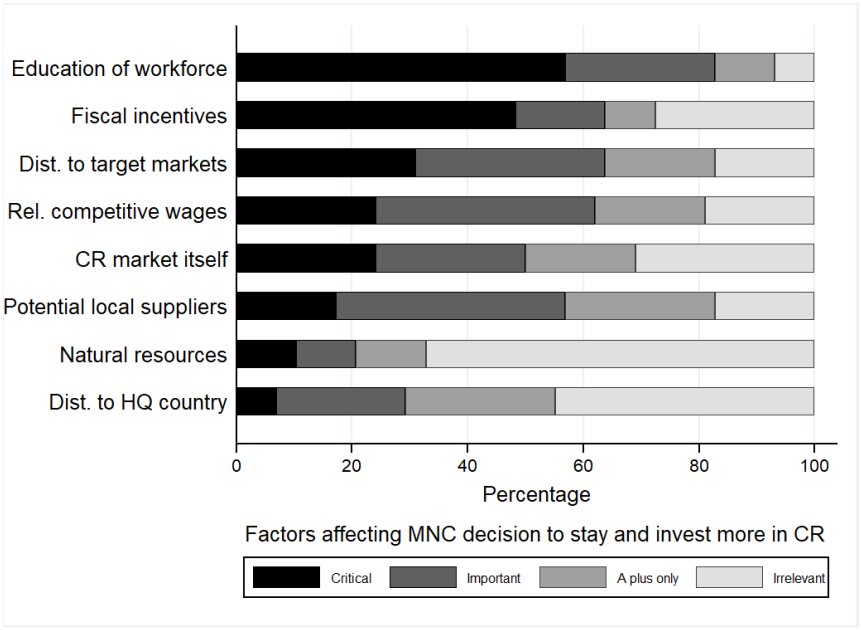


Figure G17: Question 4: To your knowledge, how important were the following factors in the decision of the multinational to STAY or EXPAND in Costa Rica?

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 Costa Rica? 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 Costa Rica? Complete all the options and choose how important you think each criterion was." Question type: Likert-type scale. Survey version: both long and short (N=58). Section: "General questions about the multinational's incentives to invest in Costa Rica." The scale and the options were the same as those proposed for Question 3.

Figure G17 summarizes the findings from Question 4.

Table G15: Question 5: In general, how important are the following criteria when choosing a new supplier in Costa Rica (Costa Rican or not)?

Criterion	Critical	V. Important	Important	Only useful	Irrelevant
Quality of products/services	75.9	15.5	6.9	0.0	1.7
Will or ability to adapt to MNCs	60.3	25.9	10.3	1.7	1.7
Price of products/services	43.1	32.8	15.5	6.9	1.7
Reliability, traceability etc.	31.0	37.9	19.0	6.9	5.2
ISO certificates	20.7	50.0	15.5	5.2	8.6
Productive capacity	12.1	29.3	36.2	10.3	12.1
Will or ability to invest	8.6	32.8	25.9	15.5	17.2
Distance supplier-MNC	6.9	24.1	20.7	27.6	20.7
Prior experience exporting	5.2	19.0	15.5	25.9	34.5
Foreign language	5.2	19.0	17.2	20.7	37.9
Same HQ country	3.4	0.0	5.2	19.0	72.4
Be part of a FTZ	3.4	1.7	13.8	22.4	58.6
Will to move closer	1.7	17.2	19.0	37.9	24.1
Prior experience w/ MNCs	1.7	36.2	25.9	20.7	15.5
Being foreign-owned	0.0	0.0	1.7	13.8	84.5

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 Costa Rica (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 Costa Rica (Costa Rican or not)? Complete all the options, selecting the importance that you think each criterion has." Section: "Relations with local suppliers (located in Costa Rica). 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 the multinational."

Table G15 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 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%).

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 version: both 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 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 G16 summarizes the answers of 40 multinationals to Question 7.

Table G16: 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 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.

Table G17: 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 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 G17 summarizes the answers of 40 multinationals to Question 9.

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 profits/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 G18 we categorized the answers provided by the 23 respondents into four categories, which we created based on the common themes emerging across answers.

Table G18: Questions 11, 12, and 13: Top 3 most important benefits to becoming a supplier to MNCs, according to MNCs

Most important benefit		Second most important benefit		Third most important benefit	
8	Stability and predictability	11	Learning opportunities	12	Learning opportunities
7	Learning opportunities	7	Stability and predictability	5	Scale and global opportunities
7	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 G19 we categorized the answers provided by the 23 respondents into six categories, which we created based on the common themes emerging across answers.

Table G19: Questions 14, 15, and 16: Top 3 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 Costa Rica 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 Costa Rica), 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 Costa Rica), 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 Costa Rica) 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 Costa Rica)," "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 Costa Rica)," or "Other: _____."

Table G20 summarizes the answers from both Questions 17 and 18.

Table G20: Questions 17 and 18: WHICH AFFILIATE decides on the procurement of KEY (SECONDARY) INPUTS for the affiliate in Costa Rica 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	2	3.5
Joint decision	15	25.9	10	17.2
Local, with HQ feedback	8	13.8	15	25.9
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 Costa Rica and HOW? Please choose ONE option only."

Appendices References

Ackerberg, Daniel A., Caves, Kevin, and Frazer, Garth. Identification Properties of Recent Production Function Estimators. Econometrica, 83(6):2411–2451, 2015. doi: 10.3982/ECTA13408.

Bernard, Andrew, Boler, Esther Ann, Massari, Renzo, Reyes, Jose-Daniel, and Taglioni, Daria. Exporter Dynamics and Partial-Year Effects. American Economic Review, 107(10), October 2017.

Bernard, Andrew, Moxnes, Andreas, and Saito, Yukiko U. Production Networks, Geography and Firm Performance. Journal of Political Economy, 2019.

Brockmeyer, Anne, Hernandez, Marco, Kettle, Stewart, and Smith, Spencer. Casting a Wider Tax Net: Experimental Evidence from Costa Rica. Working Paper, 2016.

De Loecker, Jan and Warzynski, Frederic. Markups and Firm-Level Export Status. American Economic Review, 102(6):2437–71, May 2012.

Ferraz, Claudio, Finan, Frederico, and Szerman, Dimitri. Procuring Firm Growth: The Effects of Government Purchases on Firm Dynamics. NBER Working Paper 21219, 2016.

Kalemli-Özcan, Şebnem, Sørensen, Bent, Villegas-Sanchez, Carolina, Volosovych, Vadym, and Yeşiltaş, Sevcan. How to Construct Nationally Representative Firm Level Data from the ORBIS Global Database. Note, 2015.

Levinsohn, James and Petrin, Amil. Estimating Production Functions Using Inputs to Control for Unobservables. The Review of Economic Studies, 70(70):317–341, 2003.

Monge-González, Ricardo and Rodriguez-Álvarez, Juan Antonio. Impact Evaluation of Innovation and Linkage Development Programs in Costa Rica: The Cases of PROPYME and CR Provee. IDB Working Paper Series, 461:1–78, 2013.

OECD. Costa Rica: Good Governance - From Process to Results. Technical report, OECD, 2015.

OECD. Tax Policy Reviews: Costa Rica 2017. Technical report, OECD, 2017.