

# Linkages with Multinationals: The Effects on Domestic Firms' Exports\*

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\* The views and interpretations in this presentation are strictly those of the author and should not be attributed to the Inter-American Development Bank, its executive directors, or its member countries.

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- ▶ Foreign affiliates are typically larger, more productive, more capital intensive, more likely to export, and invest relatively more in R&D than the domestic firms (e.g., Antràs and Yeaple, 2014).

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Multinational Firms' Shares in Numbers and Values, Uruguay, 2013-2016

	2013	2014	2015	2016
Number of MNEs	1,105	1,174	1,164	1,127
MNEs as a % of all firms	0.4	0.4	0.4	0.4
MNEs' share of domestic sales	21.6	17.4	15.8	17.3
MNEs' share of domestic purchases	17.5	18.0	15.3	17.3
MNEs' share of employees	10.1	9.9	9.7	9.7
MNEs' share of exports	57.8	59.0	61.2	61.7

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

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- ▶ ...and are more productive in terms of...
  - ▶ ...labor productivity.

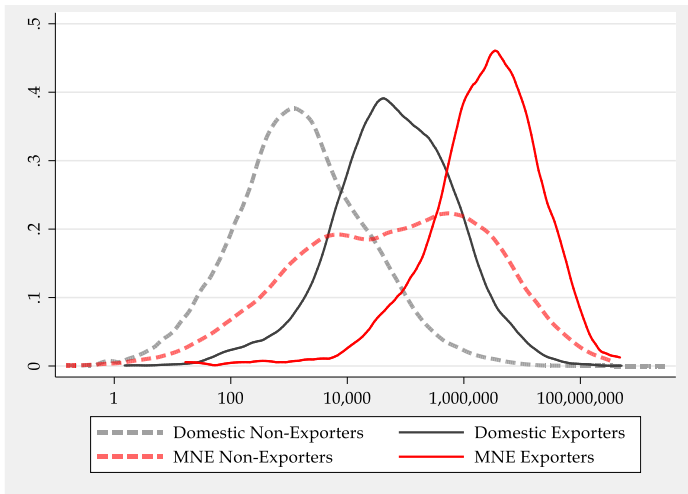
# Multinational Firms in Uruguay

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## They Buy More

Domestic Purchases, by Type of Firm, Uruguay, 2016



Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

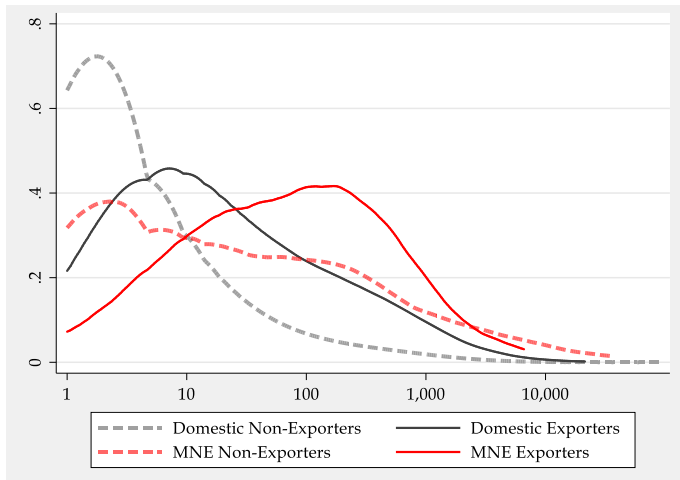
# **Multinational Firms in Uruguay**

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## They Buy from More Suppliers

Number of Suppliers, by Type of Firm, Uruguay, 2016



Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

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MNE Foreign Affiliates' "Premium", Size and Performance, Uruguay, 2016



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MNE Foreign Affiliates' "Premium", Size and Performance, Uruguay, 2016

Total sales	1.934*** (0.047)	1.493*** (0.099)
Domestic sales	1.828*** (0.048)	1.400*** (0.119)
Number of buyers	0.938*** (0.025)	0.650*** (0.069)
Domestic purchases	2.077*** (0.041)	1.667*** (0.169)
Number of suppliers	1.034*** (0.023)	0.798*** (0.083)
Number of employees	0.945*** (0.020)	0.762*** (0.071)
Sales per employee	1.223** (0.110)	0.665*** (0.239)
Propensity to Export	0.272*** (0.003)	0.231*** (0.039)
Total Exports	1.234*** (0.093)	0.934*** (0.108)
Sector Fixed Effects	No	Yes

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

# Multinational and Domestic Firms

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- ▶ As seen above, multinational firms are large and have broad networks of input-output relationships, i.e., they are connected with a large number of domestic firms.
- ▶ Given the deep connections of multinational firms with the domestic economy, the question arises of whether and how linking up with multinational firms affects domestic firms' performance.

# **Linkages and Domestic Firms' Performance**

## **What We Know: The Existing Evidence**

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### ► *Vertical Spillovers*

⇒ There is evidence of productive vertical spillovers from FDI to local firms in upstream sectors (e.g., Aitken et al., 1997; Javorcik, 2004; Blyde et al., 2004).

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### ► *Labor Turnover and Spin-Offs*

⇒ FDI generates spillovers through labor turnover of highly skilled workers (e.g., Balsvik, 2011; Poole, 2013) and the creation of new businesses by former employees of multinational firms (e.g., Muendler et al., 2012; Muendler and Rauch, 2018).



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- establishing new trade links (e.g., Swenson, 2008; Di Ubaldo and Siedlschlag, 2019); and
- upgrading the quality of countries' and firms' export baskets (e.g., Harding and Javorcik, 2012; Swenson and Chen, 2014; Ciani and Imbruno, 2017; Bagjar and Javorcik, 2019).

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*Firm-to-firm relationships are not observed but assumed based on I-O tables*

⇒ Evidence on the effects of actual linkages with multinationals on domestic firms' performance is largely absent.

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⇒ Exception: Evidence suggests that Costa Rican domestic firms experienced strong improvements in performance, including TFP, and sales growth along both the intensive and extensive margin after starting to sell to a multinational firm (Alfaro-Ureña et al., 2019).

To be noted, Costa Rica does not have VAT, which creates concerns about the accuracy of the firm-to-firm data.



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## What We Do Not Know: The Linkages "Black Box"

- ▶ **Actual Linkages and Domestic Firms' Exports**

*Evidence on how actual linkages affects domestic firms' export outcomes is virtually missing.*

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    - ▶ trade micro data at the transaction-level to typify in a detailed manner the level and nature of their international commercial relationships.

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  - ▶ Exports to buying firms that are not related with the multinational firm to which the domestic firm is linked for destinations where the former has affiliates.



# Outline

- 1 Measuring Linkages and Domestic Firms' Attributes and Outcomes
- 2 Empirical Approach
- 3 Estimation Results
- 4 Conclusions

# **Domestic Firms' Attributes and Outcomes Data**

# Domestic Firms' Attributes and Outcomes

## Data

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# Domestic Firms' Attributes and Outcomes Data

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- ▶ **Databases on Domestic Firms' Attribute and Outcome Measures**
  - ▶ *Tax Agency's Database at the Firm-Level*: data on firms' location, sector of activity, starting year, employment, and sales for the population of firms in the economy over the period 2008-2016 (2017).
  - ▶ *Customs' Database at the Transaction Level*: data on product-specific exports and imports by firm pairs to typify domestic firms' trade relationships distinguishing those with established multinationals from those with others over the period 2000-2017.

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### ► Databases on Location of Affiliates of Multinational Firms

- *WorldBase*: data on home country, year of establishment, and sector of activity for all multinational firms and data on host country, year of establishment, and sector of activity for each of their affiliates.
- *IPAs' Database*: data on starting year, sector of activity, and operation regime (e.g., free trade zones) for established foreign affiliates.

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### ► Database on Linkages

- *Tax Agency's Database at the Firm-Firm Level*: data on firm-to-firm sales/purchases as computed from VAT declarations that accurately maps connections between all firms and particularly between multinational and domestic firms over the period 2013-2016 (2017).

# Linkages with Multinationals

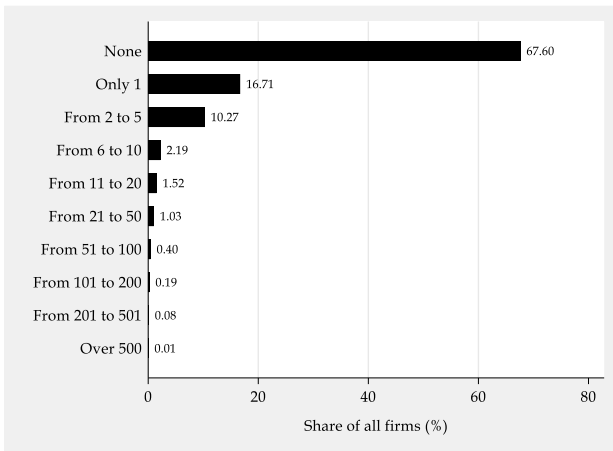
## Share of Domestic Firms, by Number



# Linkages with Multinationals

## Share of Domestic Firms, by Number

Share of Domestic Firms in 2016  
Number of Linkages with Multinational Firms



Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

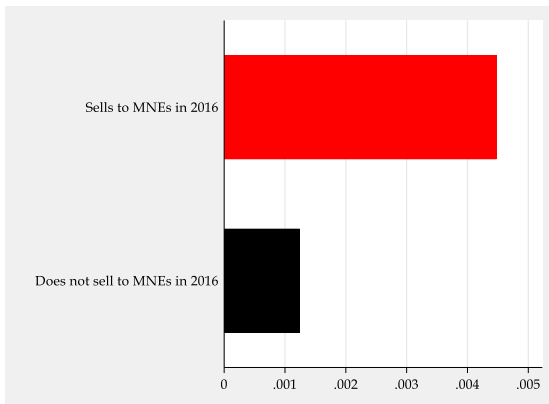
# Linkages and Domestic Firms' Exports

## Linkage Status

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## Linkage Status

Share of Exporting Firms in 2016  
Depending on Whether Domestic Firms Sold to a Multinational Firm or Not



Sample: Firms that were not exporting in 2015 and have never sold to an MNE before 2016.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

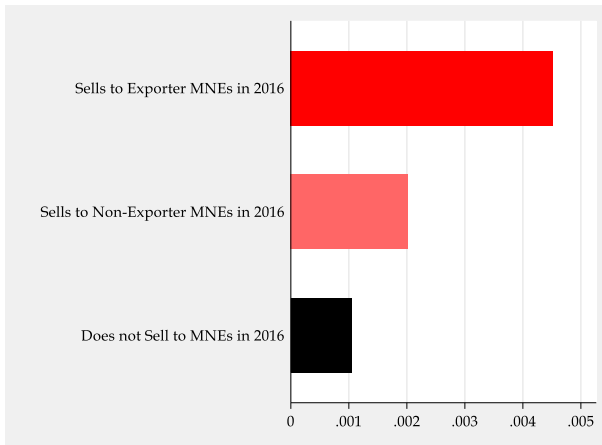
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## Linkage Types

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## Linkage Types

Share of Exporting Firms in 2016  
Depending on the Type of Multinational Firm to which Domestic Firms Sold



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Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

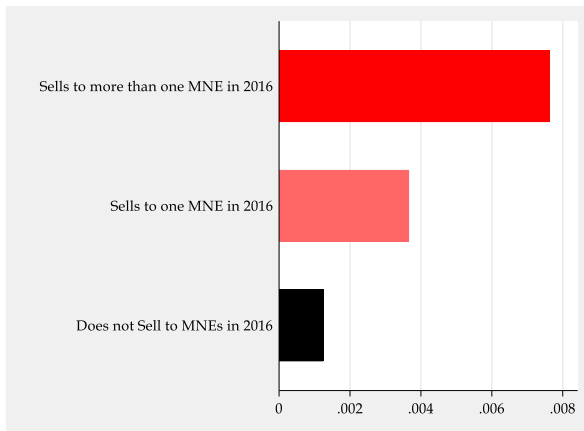
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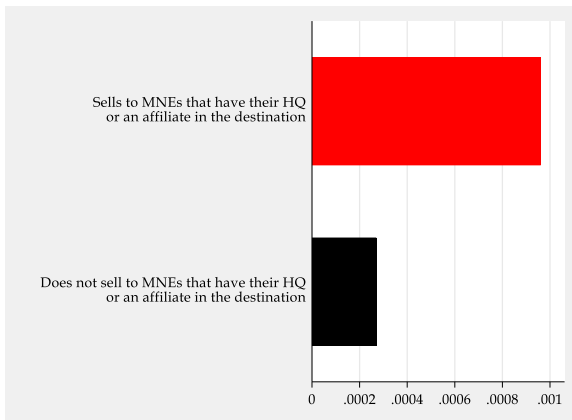
## Destination-Specific Exports



# Linkages and Domestic Firms' Exports

## Destination-Specific Exports

Share of Firms exporting to a Specific Destination in 2016  
Depending on Whether Domestic Firms Sold to a Multinational Firm with HQ or Affiliates  
in that Destination or Not



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## Buyer-Seller Type-Specific Exports

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## Buyer-Seller Type-Specific Exports

Total Domestic Sales and Exports  
Depending on the Type of Buyer-Seller Pair

Type of Seller-Buyer Pair	Total (Billion USD)		Share of Total (%)	
	Domestic	Exports	Domestic	Exports
All Seller and Buyers	49.62	6.00	100.00%	100.00%
Seller is an MNE Affiliate	8.60	3.70	17.33%	61.65%
Buyer is an MNE Affiliate	8.59	2.71	17.31%	45.23%
Seller and Buyers are MNE Affiliates.	1.72	1.73	3.46%	28.82%
Seller and Buyer are Affiliates of the same MNE ( <i>Intra-Firm Trade</i> )	0.38	0.86	0.78%	14.33%
Seller Exports to Other Affiliates of the MNE that Owns the Affiliate to which It Sells Domestically ( <i>Double Linkage</i> )	0.30	0.47	0.60%	7.82%
MNE Affiliate Exports to Other Affiliates of the MNE that Owns the Affiliate to which It Sells Domestically ( <i>Double Linkage - MNEs</i> )	0.16	0.34	0.33%	5.66%
Domestic Firm Exports to Other Affiliates of the MNE that Owns the Affiliate to which It Sells Domestically ( <i>Double Linkage - Domestic</i> )	0.14	0.13	0.28%	2.17%

Sample: All Buyer-Seller Pairs in 2016. Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and WorldBase.

# Outline

- 1 Measuring Linkages and Domestic Firms' Attributes and Outcomes
- 2 Empirical Approach
- 3 Estimation Results
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# Linkages and Domestic Firms' Exports

## Empirical Approach

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$$Z_{gst} = \sum_{k=K^0}^{K^1} \zeta_k \text{Linkage}_{gst-k} + \sum_{j=1}^J \kappa_j X_{gst-1}^j + \chi_{gs} + \omega_{st} + \varepsilon_{gst}$$

- ▶ where  $Z$  is a firm-level economic export outcome; *Linkage* is a binary indicator that takes the value of one if the domestic firm is connected to a multinational firm through commercial relationships;  $X$  includes variables such as other firm-level attributes and assistance from public agencies (e.g., export promotion).

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- ▶ This equation is estimated on a sample of firms that did not export and were not linked to a multinational in the past.
- ▶ It can be generalized to allow for heterogeneous effects and adapted to examine the effects of linkages exploiting the two-sided trade data.

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# Estimation Results

## Baseline

# Estimation Results

## Baseline

Sells to MNE firms in $t$	0.0026*** (0.0007)	0.0026*** (0.0007)	0.0026*** (0.0007)	0.0026** (0.0019)
Buys from MNE firms in $t$		0.0003 (0.0004)		0.0003 (0.0004)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	181,591	181,591	181,591	181,591

Sample: Firms that were not exporting in  $t-1$  and have never sold to an MNE.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

## Lagged Linkages

# Estimation Results

## Lagged Linkages

Sells to MNE firms in $t-1$	0.0025** (0.0010)	0.0026** (0.0010)	0.0023** (0.0010)	0.0024** (0.0011)
Buys from MNE firms in $t$		0.0006 (0.0004)		0.0007* (0.0004)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	115, 115	115, 115	115, 115	115, 115

Sample: Firms that were not exporting in  $t-2$  nor in  $t-1$  and have never sold to an MNE.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

## Placebo Test

# Estimation Results

## Placebo Test

Sells to MNE firms in t+1	0.0011 (0.0009)	0.0012 (0.0010)	0.0011 (0.0009)	0.0010 (0.0010)
Buys from foreign firms in t+1		0.0000 (0.0005)		0.0000 (0.0005)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	107,611	107,611	107,611	107,611

Sample: Firms that were not exporting the previous year and have never sold to an MNE before.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.



# Estimation Results

Any Linkages? No, Only Direct Linkages...

# Estimation Results

## Any Linkages? No, Only Direct Linkages...

Sells to a domestic firm that sells to an MNE firm in $t$	0.0015* (0.0009)	0.0015* (0.0009)	0.0003 (0.0003)	0.0003 (0.0003)
Buys from MNE firms in $t$		0.0000 (0.0000)		0.0000 (0.0000)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	22,644	22,644	22,644	22,644

Sample: Firms that were not exporting the previous year, have never sold to an MNE before and were not selling in the previous year to a domestic firm that sold to an MNE in that year.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

...But There Seems to Be a Sequence

# Estimation Results

## ...But There Seems to Be a Sequence

<i>Dependent Variable: Sells to MNE firms in t</i>				
Sells to a domestic exporter in $t-1$	0.0538*** (0.0056)	0.0538*** (0.0044)	0.0451*** (0.0055)	0.0450*** (0.0056)
Buys from MNE firms in $t$		-0.0011 (0.0033)		-0.0022 (0.0033)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	127,583	127,583	127,583	127,583

Sample: Firms that were not exporting nor selling to a domestic exporter in the previous year and that have never sold to an MNE before. Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

## Linkage Types

# Estimation Results

## Linkage Types

Sells to MNE Exporters	0.0026*** (0.0009)	0.0026*** (0.0009)	0.0025*** (0.0009)	0.0025*** (0.0009)
Sells to MNE Non-Exporters	0.0004 (0.0007)	0.0004 (0.0007)	0.0003 (0.0007)	0.0003 (0.0007)
Sells to Domestic Exporters	0.0005 (0.0003)	0.0005 (0.0003)	0.0005 (0.0003)	0.0005 (0.0003)
Buys from MNE firms		0.0002 (0.0003)		0.0001 (0.0003)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	181,591	181,591	181,591	181,591

Sample: Firms that were not exporting the previous year and have never sold to an MNE before.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

## Linkage Intensity

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Sells to more than one MNE firm	0.0077*** (0.0027)	0.0076*** (0.0027)	0.0073*** (0.00269)	0.0073*** (0.0027)
Sells to one MNE firm	0.0015** (0.0007)	0.0015** (0.0007)	0.0016** (0.0007)	0.0016** (0.0007)
Buys from MNE firms		0.0003 (0.0004)		0.0002 (0.0004)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	181,591	181,591	181,591	181,591

Sample: Firms that were not exporting the previous year and have never sold to an MNE before.

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.



# Estimation Results

## Linkage Intensity for Already Linked Domestic Firms

# Estimation Results

## Linkage Intensity for Already Linked Domestic Firms

Number of MNE Buyers ( <i>ln</i> )	0.0055** (0.0022)	0.0055** (0.0023)	0.00523** (0.00221)	0.0053** (0.0023)
Buys from MNE Firms		-0.0003 (0.0005)		-0.0002 (0.0005)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	No
Sector-Year Fixed Effects	No	No	Yes	Yes
Control Variables	S, L, I, EP	S, L, I, EP	S, L, I, EP	S, L, I, EP
Observations	80,728	80,728	80,728	80,728

Sample: Firms that were not exporting the previous year and were selling to at least one multinational firm in the previous year. Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

# Estimation Results

## The Firm-Destination Extensive Margin

# Estimation Results

## The Firm-Destination Extensive Margin

Exports to:	Any Firm	Any Firm	Not Same MNE as Domestic Linkage	Same MNE as Domestic Linkage
Sells to MNEs that have their HQ or an affiliate in the country	0.000034*** (0.000013)			
Sells to MNEs that have their HQ in the country		0.000099 (0.000093)	0.000067 (0.000093)	0.000037* (0.000022)
Sells to MNEs that have an affiliate in the country		0.000030** (0.000013)	0.000026** (0.000013)	0.000004 (0.000002)
Firm-Destination Fixed Effects	Yes	Yes	Yes	Yes
Firm-Year Fixed Effects	Yes	Yes	Yes	Yes
Destination -Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	55,939,168	55,939,168	55,939,168	55,939,168

Source: Authors' calculations based on data from DGI, DNA, URUGUAY XXI, and Worldbase.

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- ▶ This is particularly the case when the multinational firm is an exporter itself and when more linkages are established.
- ▶ Non-exporting domestic firms that are already linked with a multinational firm and increase their number of linkages are more likely to become an exporter.
- ▶ In terms of the destination extensive margin, domestically-linked firms tend to start exporting to countries where the multinational firm is headquartered (the firm itself) or has affiliates (other firms).

**Conclusions**

**Next Steps**

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**THANK YOU**