# Follow FDI: Production Networks and the Geography of Globalization*

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**Abstract**

Follow FDI refers to the phenomenon whereby a supplier of a multinational firm establishes foreign affiliates in the same countries as their multinational customer, effectively replicating the supply chain abroad. Using novel Japanese data, we show that roughy one third of local affiliate sales (and purchases) are to other Japanese affiliates operating in the same country, indicating that a substantial share of multinational activity takes place within replicated domestic supply chains. Event studies confirm that when a firm starts selling to a multinational in Japan, the supplier is more likely to become a multinational itself. Our findings provide new micro-level evidence on how domestic value chains shape global value chains and the geography of globalization. The results highlight (i) the importance of domestic production networks in mediating access to international markets and (ii) a novel channel through which multinational activity spills over to domestic suppliers. These findings broaden and enhance our understanding of (i) why firms become multinationals, (ii) the dynamics of affiliate sales and (iii) the potential spillover effects of multinational activity.

JEL: F10, F14, F23

Keywords: Foreign direct investment, multinational production, international trade, production networks.

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# 1 Introduction

Multinational firms are the engines of the global economy. While small in numbers, these firms generate around one third of global GDP and two-thirds of international trade (Miroudot and Rigo, 2022). Recent research has made progress on understanding how and why firms become multinationals and into which markets they enter (Antràs and Yeaple, 2014). However, the literature has not studied the causes and consequences of so-called follow foreign direct investment (FDI) - that suppliers of multinational firms themselves establish foreign affiliates in the same countries as their multinational customer, effectively replicating the supply chain abroad.[1] As we show below, follow FDI is pervasive. This paper examines how domestic production networks shape firms' decisions to engage in multinational production. We explore the hypothesis that firms are more likely to globalize—via FDI—when they are connected to multinational enterprises (MNEs) through domestic supply chains. Specifically, we ask: do domestic suppliers "follow" their multinational customers abroad?

Such an analysis requires comprehensive firm-level data on both domestic supply chains and multinational activity. Therefore, we combine two high-quality firm-level datasets from Japan: (1) the Basic Survey of Overseas Business Activities (BSOBA), which captures detailed information on Japanese foreign affiliates, and (2) firm-to-firm transaction data from Tokyo Shoko Research (TSR), which maps domestic supplier-customer links. Merging these data at the firm level allows us to track how relationships with MNEs influence the timing and geography of firms' globalization decisions.

The first part of the paper establishes a set of stylized facts on follow FDI. First, follow FDI is economically significant: one fifth of affiliate sales go to other affiliates from the same source country (i.e., to other Japanese affiliates operating in the destination country). Second, while only a small share of firms are multinationals (0.6%), a much larger share are connected to them: over 20% of firms supply to MNEs. This illustrates that multinationals have orders of magnitude more domestic suppliers and customers compared to non-multinationals. As such, their presence is a potential gateway for non-MNEs to become MNEs. Third, we show that follow FDI firms are typically smaller at home: firms with a high share of affiliate sales going to other Japanese affiliates have lower sales in Japan. As an example, a car manufacturer may be the lead firm, while a car-parts manufacturer the follower, selling most of its affiliate output to the lead firm, and the follower tends to have lower domestic sales compared to the lead firm. This suggests that connections to MNEs help reduce the costs - or boost the benefits - of becoming an MNE, in particular for relatively small firms.

[1] This phenomenon has also been called "follow-the-customer FDI".

To estimate the causal impact of these relationships on firms' globalization decisions, we use an event-study approach. We start by identifying events where a domestic firm starts selling to an MNE in Japan. The period of analysis is 2014 to 2022, and during this period, we have roughly 127,000 domestic firms that start supplying to an MNE in Japan. We proceed by estimating the year-on-year likelihood of becoming a multinational after starting to supply an MNE. In the baseline sample, we include both firms starting to sell to an MNE and firms that never sell to an MNE (while firms always selling to an MNE are excluded). As such, the identifying assumption is that firms yet to supply to an MNE are a credible counterfactual for first-time suppliers to MNEs, after controlling for firm trends and industry and prefecture trends.

A potential concern with this type of firm-level event study is that unobserved shocks to a supplier (e.g. a positive productivity shock) increase the likelihood of both getting an MNE customer and to become an MNE itself. We sidestep this issue by also performing the event-study at the firm-destination level, i.e. the unit of analysis is multinational entry by firm $i$ in destination $n$. This enables us to include firm-year fixed effects, which effectively controls for unobserved firm-level shocks. As such, if treatment firms are simply on a trajectory of becoming multinationals (due to shocks unobserved by the econometrician), then these confounding factors are effectively controlled for by the inclusion of firm-year fixed effects.

The event-study results can be summarized as follows. First, becoming a first-time supplier to an MNE increases the likelihood of a firm becoming an MNE itself by 15-30 percent, depending on the sector of the firm. The firm-level and firm-destination level analyses yield broadly similar results. We find no pre-trends in observables for first-time suppliers. Moreover, the following placebo exercise also strengthen the validity of the empirical model. We estimate a model where the treatment is becoming a first-time supplier to a large non-MNE firm. We find insignificant and near-zero treatment effects, suggesting that it is the MNE status of the customer that matters, not merely firm size. We find that the follow FDI effects are strongest in countries where Japanese subsidiaries engage heavily in intra-group trade (i.e., in countries a large share of affiliate sales go to other Japanese MNEs in that market).

While our analysis focuses on Japan, there is substantial evidence that similar mechanisms operate in other economies. Case studies and sectoral analyses document supplier following behavior in a range of settings, including the European automotive industry, where lead firms' foreign investments were accompanied by the relocation of key suppliers (Pavlínek, 2015).[2]

[2] Moreover, Guillén (2002) documents that Korean automotive parts manufacturers entering China exhibit behavior consistent with follow FDI. Sturgeon et al. (2008) show that foreign suppliers in the automotive industry locate plants close to automakers.

In the final part of the paper, we explore various mechanisms that might explain the presence and magnitude of follow FDI. First, we set up a simple model to shed light on the mechanisms. In the model, a potential Japanese supplier to an MNE operating in country $n$ can choose between exporting to $n$, which incurs an iceberg trade cost $\tau$, or becoming an MNE in $n$ itself, which incurs a fixed cost $F$. This is the standard proximity-concentration trade-off from the literature (e.g. Helpman et al., 2004). We focus on the case where inputs are not substitutable across suppliers, therefore the lead firm cannot easily find alternative non-Japanese suppliers in the foreign market. According to the model, the supplier is more likely to follow when (i) demand from the customer is high, (ii) the input intensity of the lead firm is high, (iii) the costs of setting up an affiliate is low and (iii) iceberg trade costs are high. Second, we test these theoretical predictions in the data. For (i), we narrow down on the event of becoming the first-time supplier of a large MNE, which is a proxy for high customer demand.[3] The estimation results confirm that the follow FDI effect is stronger for this subsample compared to the overall sample. For (iv), we narrow down on the event of becoming a supplier to an MNE in an input-intensive industry. Again, our results show that the follow FDI effect is stronger for this subsample.

Our findings on the the presence, and magnitude, of follow FDI has several important implications. First, standard datasets on multinational activity typically classify affiliate sales to other firms in the destination country as local sales. Economists would then typically infer that this is "horizontal" sales, i.e. that output is intended for the local market, and that a model of horizontal FDI is appropriate. The presence of follow FDI enriches and modifies this understanding: local sales may not be "horizontal" at all - one would need data on the full supply chain to infer whether sales is ultimately absorbed in the local market or not. Second, our findings show that the decision to become a multinational is not made in a vacuum, it is a function of the multinational status of firms in your domestic network (e.g., your customers). As such, the results highlight the importance of domestic production networks in mediating access to international markets. Third, follow FDI will modify, and perhaps dampen, the strength of spillovers in destination markets. Previous research has shown that multinational firms create productivity spillovers to local firms in upstream or downstream sectors (Javorcik, 2004). Yet, if many of these firms are themselves affiliates, some of these productivity effects may be muted. We leave this interesting and relevant question for future research.

This paper makes three contributions. First, we document new stylized facts on follow FDI using comprehensive Japanese firm-level data, showing that a large share of affiliate

[3] The Japanese firm-to-firm data is binary, i.e. it includes information about whether a transaction has occured, but not the value of the transaction.

activity takes place within replicated domestic supply chains. Second, using event-study designs at both the firm and firm–destination levels, we provide causal evidence that supplying to multinational firms increases the likelihood of MNE activity and that domestic networks shape the geography of suppliers' foreign direct investment. Third, we develop a simple model of follow FDI and provide empirical support for its key mechanisms, highlighting the role of customer demand and input intensity.

This paper relates to several strands of the literature on multinational firms, production networks, and global value chains.

*Multinational Firms and Foreign Direct Investment.* A large literature studies the determinants and consequences of foreign direct investment. Classic contributions emphasize firm-level productivity, scale, and fixed costs as key determinants of multinational status, as well as proximity to markets and trade costs as drivers of the location of foreign affiliates (e.g., Bernard et al., 2018; Helpman et al., 2004; Irarrazabal et al., 2013; Tintelnot, 2017) In this framework, firms' FDI decisions are typically modeled as independent choices, conditional on firm characteristics and destination-specific fundamentals. While this literature has been highly successful in explaining broad patterns of multinational activity, it largely abstracts from production networks and from the possibility that firms' FDI decisions may be interdependent. This paper complements that literature by showing that FDI decisions are systematically linked through customer–supplier relationships.

*Multinationals and Domestic Production Networks.* A growing literature studies how multinational firms interact with domestic suppliers and customers. A prominent line of work documents the effects of selling to multinational firms on domestic suppliers' performance, including productivity, scale, and organizational upgrading. Using firm-to-firm transaction data, this literature shows that becoming a supplier to a multinational customer can generate persistent improvements in firm outcomes, consistent with learning, upgrading, or access to better demand (e.g., Alfaro-Urena et al., 2022; Amiti et al., 2024). Our paper is related to this literature but differs in focus and scope. Whereas existing work primarily studies how supplying to multinationals affects firms' performance, we study how these linkages shape firms' multinational activity.

*Spatial Clustering and Co-Location of Multinational Activity.* Several studies document that multinational firms cluster geographically, both across countries and within regions, and that co-location can arise from agglomeration forces, input sharing, and demand complementarities (e.g., Head et al., 1995; Setzler and Tintelnot, 2021). Our results provide direct firm-level evidence for a complementary mechanism: co-location driven by vertical customer–supplier relationships.

*Global Value Chains and Follow FDI.* Finally, this paper relates to descriptive and case-

study evidence in the international business literature documenting follow FDI, whereby suppliers replicate supply chains abroad alongside lead firms (e.g., Hatch, 2005; Moriuchi et al., 2025). While such behavior is frequently discussed in case studies—particularly in industries such as automobiles and electronics—systematic evidence on its prevalence and causal determinants has been limited. By combining economy-wide production network data with detailed information on multinational affiliates, this paper provides the first large-scale causal evidence on follow FDI.

The remainder of this paper is organized as follows. Section 2 presents the data sources and stylized facts on follow FDI. Section 3 lays out the empirical methodology and estimation results. Section 4 discusses economic mechanisms, connecting additional empirical results to simple model predictions. Section 5 concludes.

# 2 Data and Stylized Facts

## 2.1 Data sources and preparation

This study employs two datasets. First, we use the dataset Basic Survey on Overseas Business Activities (BSOBA) provided by Ministry of Economy, Trade and Industry to examine Japanese firms' FDI activities. BSOBA is a yearly survey from 1996 to 2022. The data includes firm-level information of Japanese MNEs and their foreign subsidiaries. For each subsidiary, we observe outcomes such as country, industry, sales and purchases. From 2010, the survey includes a detailed decomposition of sales and purchases. Specifically, we observe (1) sales to (purchase from) firms in local host countries, (2) firms in Japan, and (3) firms in other countries. For firms in local host countries (1), they are further decomposed to (a) local firms, (b) foreign subsidiaries of Japanese firms , and (c) other firms (i.e., affiliates from other countries). For sales back to Japan (2), we observe (d) sales back to their parent firm and (e) sales other firms. For this study, we will provide basic facts on the share of local sales going to other Japanese subsidiaries, i.e. (1b) relative to (1).

Second, we use a dataset provided by Tokyo Shoko Reseach (TSR) to examine firm-to-firm domestic transactions. TSR is a one of the biggest credit reporting companies in Japan. The data covers the period from 2007 to 2022, including around 1,000,000 firms for each year. The dataset includes information on industry, firm sales and employment. For each firm, we observe a list of customers and suppliers, however we do not observe the value of trade between firms. Using the name and address of firms, the BSOBA data is merged to TSR. In 2022, 98 percent of foreign subsidiaries are merged to TSD. After merging, we can identify Japanese MNEs, their subsidiaries in every destination country, and the firms connected to

Table 1: Descriptives

| | All | Manufacturing |
|---|---|---|
| MNEs | 0.6% | 2.7% |
| Firms with MNE customer(s) | 21.1% | 37.2% |
| Firms with MNE supplier(s) | 18.6% | 22.4% |
| # customers (average) | 4 | 2 |
| # suppliers (average) | 4 | 2 |
| # customers for MNEs (average) | 71 | 18 |
| # suppliers for MNEs (average) | 92 | 38 |

**Notes:** Year 2014. Population is all firms in TSR. Manufacturing restricts the sample to manufacturing firms.

Table 2: MNE status correlation matrix

| | MNE | Customer MNE | Supplier MNE |
|---|---|---|---|
| MNE | 1 | | |
| Customer MNE | 0.13 | 1 | |
| Supplier MNE | 0.05 | 0.08 | 1 |

**Notes:** Year 2014. Population is all firms in TSR.

them through domestic firm-to-firm links.

## 2.2 Stylized Facts

This section documents four stylized facts on follow FDI.

**Fact 1. Relatively few firms are MNEs, but many firms are connected to them.**

Not surprisingly, only a few firms are multinationals in our sample. Table 1 shows that the share of MNEs is 0.6 percent overall and 2.7 percent in manufacturing. However, many firms are connected to them: one fifth of all firms have an MNE as a customer. Indeed, our data shows that MNEs have an order or magnitude more customers and suppliers compared to non-MNEs (rows four to seven in Table 1). This suggests that the activities of MNEs can potentially affect many firms, and the whole economy, through its linkages in the production network.

**Fact 2. MNE status is correlated in the domestic production network.** Table 2 shows the correlation matrix between the MNE status of a firm and the MNE status of its

Table 3: MNE status regressions

| Dep. variable: MNE dummy | All | Manufacturing |
|---|---|---|
| MNE customer | 0.016*** | 0.0414*** |
| | (0.000) | (0.000) |
| MNE supplier | 0.0140*** | 0.04181*** |
| | (0.000) | (0.000) |
| Obs | 9,408,202 | 1,194,098 |
| Industry-prefecture-year fixed effects | Yes | Yes |

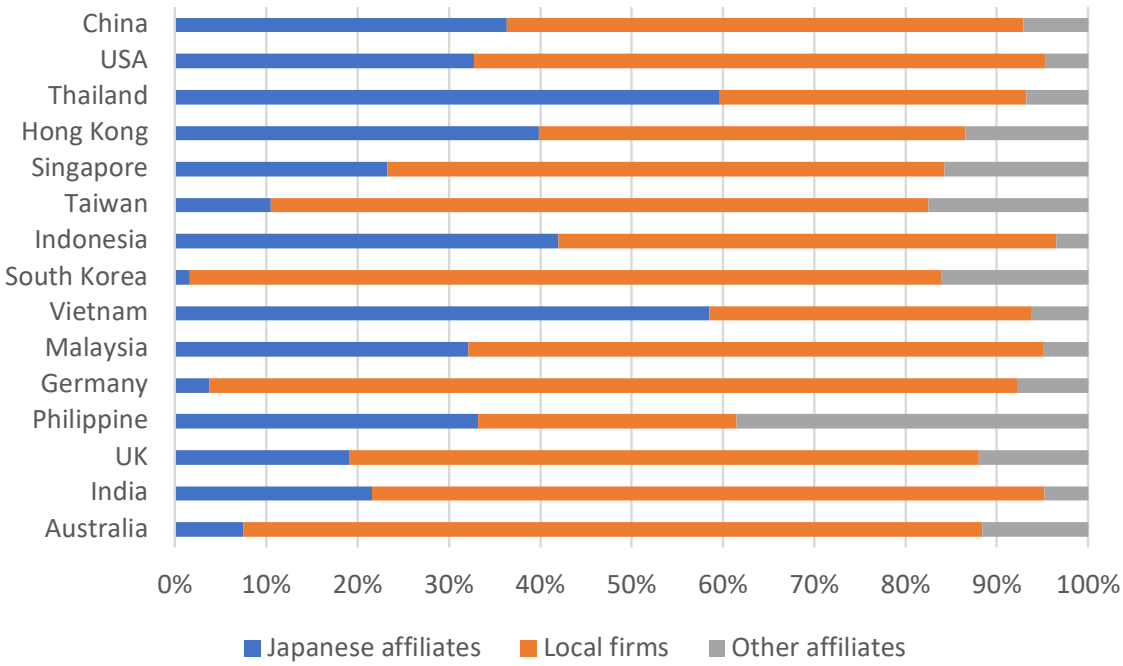
**Notes:** Years 2014-2022. Standard errors in parentheses. Industry codes are 2-digit JSIC codes.

domestic customer (supplier). These correlations are overall positive and significant, indicating assortative matching on MNE status. Table 3 shows a similar pattern in a regression analysis. We regress an indicator for MNE status on dummies for whether the customer (supplier) is an MNE, controlling for industry-prefecture-year fixed effects. These correlations suggest that matching is not random. The next section will provide causal evidence on the impact of MNE status on suppliers' MNE status.

**Fact 3. One third of local affiliate sales go to other Japanese MNEs.** Next, we utilize the MSDMO data on affiliate sales. As mentioned above, affiliate sales of firm $i$ in destination $n$ can be decomposed into (1) sales in market $n$, (2) sales back to Japan, and (3) sales to third countries. Sales in market $n$, (1), can be further decomposed into sales to (a) local firms, (b) other Japanese affiliates, and (c) other firms (affiliates from other countries). Henceforth, we denote the ratio (1b) to (1) the *follow FDI* share. Figure 1 shows the breakdown of (a), (b) and (c) relative to sales in market $n$ (1). In the aggregate, the follow FDI share is roughly one third, showing that a significant share of multinational sales to to subsidiaries from the same source country. Figure 1 show significant heterogeneity across countries: follow FDI is particularly high in Thailand and Vietnam, but also high income countries such as the U.S. and the U.K. have follow FDI shares between 20 and 30 percent.

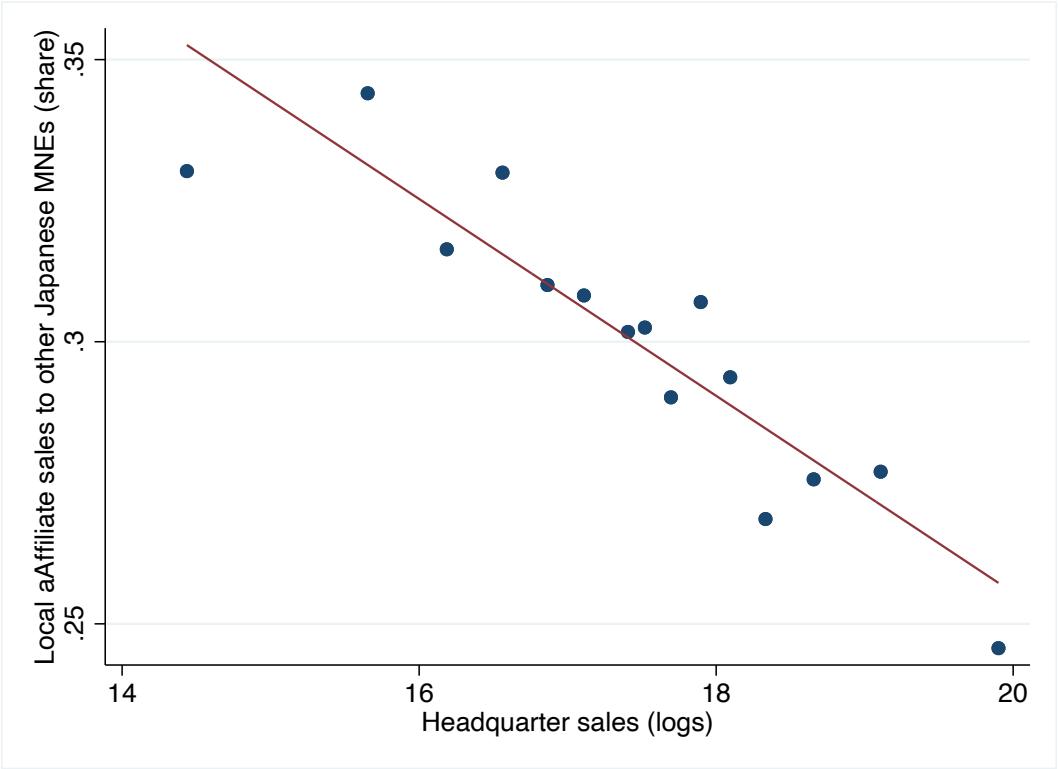
**Fact 4. Follow FDI firms are smaller at home.** Finally, we explore how the follow FDI share varies with firm characteristics. Figure 2 shows a binned scatterplot between log headquarter sales (horizontal axis) and the follow FDI share (vertical axis). Variables are demeaned by country and 2-digit industry averages. The figure shows that firms with high follow FDI shares are smaller in Japan. Figure 3 replaces headquarter sales with the share of

Figure 1: Decomposition of affiliate sales to local market.



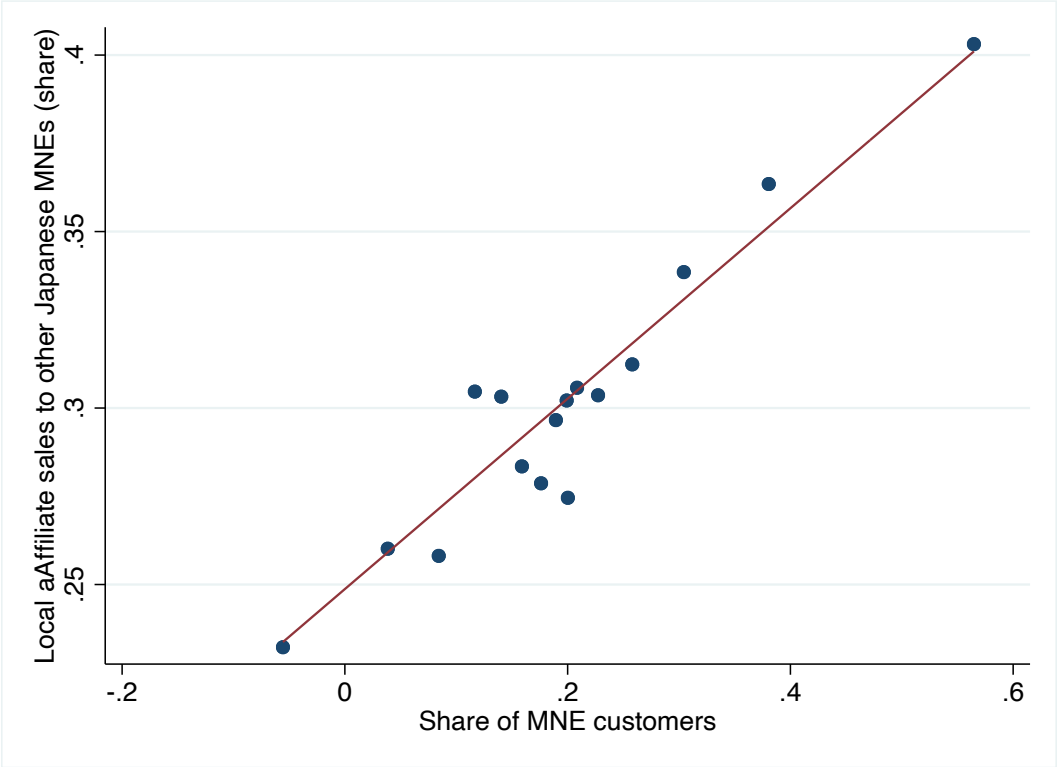

**Notes:** Years 2014-2022. Standard errors in parentheses. Industry codes are 2-digit JSIC codes.

Figure 2: Headquarter sales and follow FDI share




**Notes:** Year 2014. The binned scatterplots group firms into 20 equal-sized bins by log headquarter sales, and compute the mean of the variables on the x- and y-axes in each bin. The dependent variable is the share of affiliate sales sold to other Japanese affiliates in that market. All variables are demeaned by country and JSIC 2-digit industry averages.

Figure 3: Share of MNE customers and follow FDI share




**Notes:** Year 2014. The binned scatterplots group firms into 20 equal-sized bins by share of domestic MNE customers, and compute the mean of the variables on the x- and y-axes in each bin. The dependent variable is the share of affiliate sales sold to other Japanese affiliates in that market. All variables are demeaned by country and JSIC 2-digit industry averages.

firm $i$'s customers that are multinationals. There the relationship is positive, showing that more MNE customers in Japan is associated with higher follow FDI shares abroad. Both relationships suggest that relatively small firms, or firms relying heavily on multinational customers, also depend more on sales to other multinationals in foreign markets.

# 3 Empirical Methodology and Results

This section presents the empirical strategy and baseline results for identifying follow FDI: the likelihood of domestic suppliers to establish foreign affiliates after becoming a first-time supplier to an MNE. The analysis proceeds in two steps. First, we implement a firm-level event study that examines how firms' multinational status changes after they become first-time suppliers to an MNE. Second, we refine the design using a firm–destination event study that exploits within-firm variation across destinations to address concerns about firm-level unobserved shocks.

## 3.1 Firm-level analysis

The event of interest is the first year in which a domestic firm supplies an MNE in the domestic production network. We identify these events using the firm-to-firm transaction data and restrict attention to events occurring between 2014 and 2022. Firms that always supply MNEs are excluded, while firms that never supply MNEs during the sample period serve as controls.

The resulting sample includes both treated firms (those that become first-time suppliers to an MNE) and untreated firms (never suppliers). This design mirrors standard staggered-adoption event studies, where identification relies on comparisons between firms before and after treatment, as well as across firms that are treated at different times.Table 4 summarized the estimation sample. Roughly 130,000 firms become first-time suppliers to MNEs during the sample period. These firms are slightly larger than firms in the control group: the mean treated firm has 30 employees versus 20 employees for the mean untreated firm.

We estimate the following event-study specification:

$$y_{it} = \alpha_i + \lambda_{spt} + \sum_{k=-4}^{4} \theta_k D_{it}^k + \epsilon_{it},$$

where $y_{it}$ is an indicator equal to one if firm $i$ is an MNE in year $t$, $\alpha_i$ are firm fixed effects, $\lambda_{spt}$ are industry (2-digit JSIC)×prefecture ×calendar year fixed effects, and $D_{it}^k$ are event-time indicators equal to one if year $t$ is $k$ years relative to the first year in which firm $i$

Table 4: Event study sample

| | All | | | Manufacturing | | |
|---|---|---|---|---|---|---|
| | # firms | Avg. sales | Avg. # workers | # firms | Avg. sales | Avg. # workers |
| Treatment firms | 126,888 | 1,800,000 | 30 | 26,451 | 972,000 | 29 |
| Control firms | 957,190 | 744,000 | 20 | 70,892 | 293,000 | 12 |

**Notes:** Sales are measured in 1000s yen.

supplies an MNE (i.e., supplying to an MNE is an absorbing state). Event times are binned at $k \leq -4$ and $k \geq 4$ with $k = -1$ omitted and normalized to zero. Standard errors are clustered at the industry–prefecture level.

Identification rests on the assumption that, conditional on firm fixed effects and industry–prefecture–year shocks, firms that have not yet supplied an MNE and firms that supplied an MNE in earlier years form a valid counterfactual for firms that begin supplying an MNE. This assumption is assessed by inspecting pre-trends in the event-study coefficients. In the robustness section, we will also show results with a subsample where we exclude the never treated.

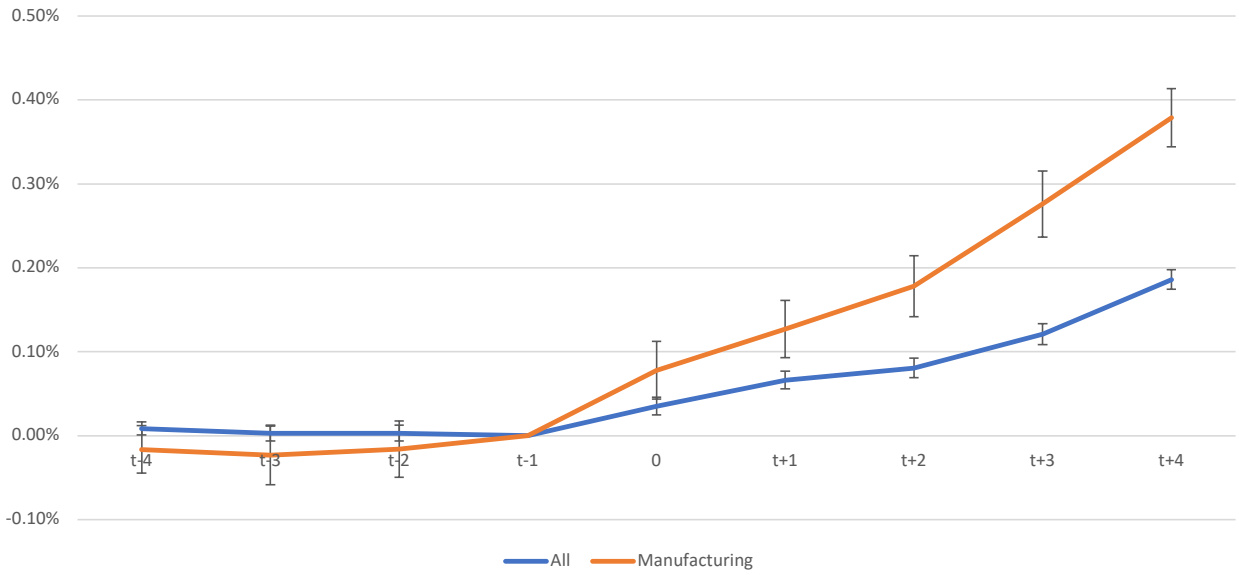
As shown in Figure 4, the firm-level event study reveals a discrete and persistent increase in the probability that a firm becomes an MNE following the onset of supplying to an MNE. In manufacturing, the likelihood of becoming an MNE rises by approximately 0.4 percentage points within four years of the event, corresponding to a roughly 14 percent increase relative to the baseline MNE share. For the full sample, the estimates correspond to a roughly 30 percent increase relative to the baseline MNE share. Pre-event coefficients are close to zero and statistically insignificant, providing support for the identifying assumptions.

## 3.2 Firm-destination analysis

A potential concern with the firm-level analysis is that unobserved firm-specific shocks, such as changes in management, productivity, or financing, may simultaneously affect both the timing of supplying to an MNE and the decision to invest abroad. To address this concern, we exploit variation across destinations within firms by implementing a firm–destination event study.

In this framework, the event is defined at the firm–country level: a firm experiences an event in destination country $c$ when it supplies an MNE that operates in country $c$. The outcome variable is an indicator for whether firm $i$ has an affiliate in country $c$ in year $t$.

Figure 4: Event study: Firm-level analysis.




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

The event-study specification is thus:

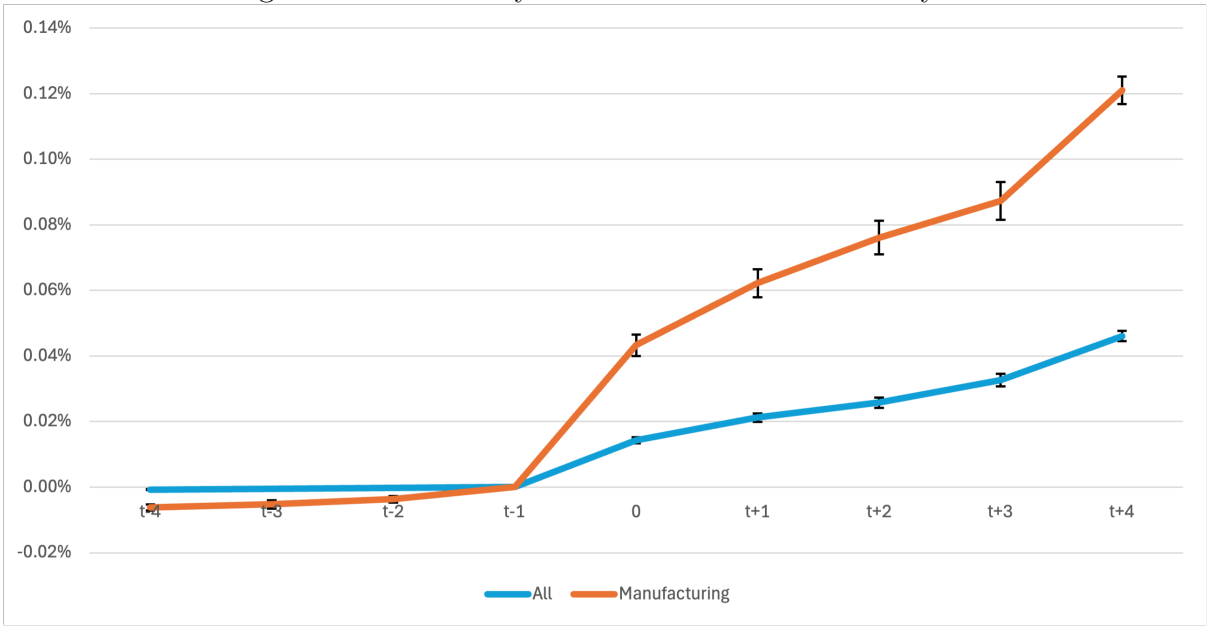
$$y_{ict} = \alpha_{it} + \lambda_{sp} + \sum_{k=-5}^{5} \theta_k D_{ict}^k + \epsilon_{ict}.$$

Compared to the firm-level analysis, the crucial difference is that we are now able to include firm-year fixed effects $\alpha_{it}$, absorbing all time-varying firm-level shocks. Identification comes from differences across destinations within the same firm and year. Hence, we rule out explanations based on firm-wide shocks and provide direct evidence that multinational customers shape the geographic pattern of suppliers' foreign investments.

The firm–country panel is extremely sparse, as most firm–country pairs never experience an event. To maintain computational feasibility, we randomly sample 5 percent of firm–country observations with zero exposure, weight them by the inverse sampling probability, and restrict attention to destination countries with at least 10 MNEs. The resulting sample contains approximately 118 million observations.

Figure 5 shows that the firm–destination analysis confirms the baseline findings. Following the event, firms become significantly more likely to establish affiliates in the destination country associated with their MNE customer. The effects are economically meaningful, statistically significant, and display no evidence of pre-trends. The magnitude of the response

Figure 5: Event study: Firm-destination-level analysis.




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

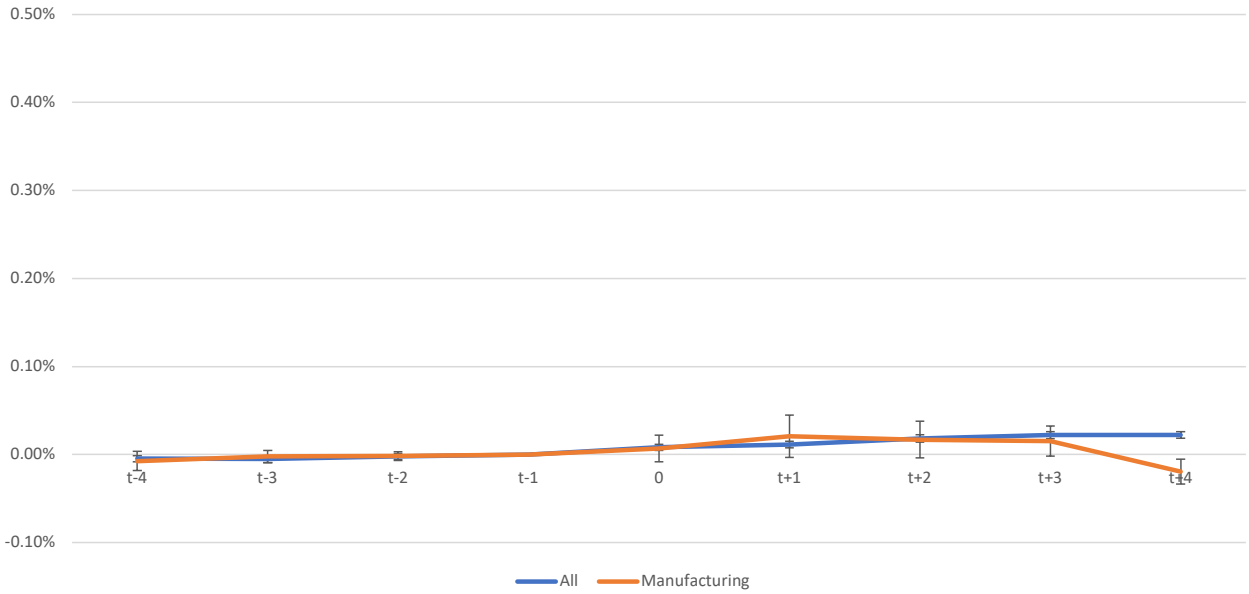
is larger in manufacturing.

Taken together, the firm-level and firm–destination event studies provide consistent evidence that domestic suppliers follow their multinational customers abroad. The results point to a mechanism in which production networks and customer–supplier relationships play a central role in shaping the extensive margin of foreign direct investment, complementing traditional explanations based on productivity, size, or market access alone.

## 3.3 Robustness

*Falsification test.* A potential concern is that MNEs are typically orders of magnitude bigger than non-MNEs, and as such the event of getting a large customer could itself trigger changes among the supplier, including becoming an MNE. We address this using a placebo firm-level event study, in which the event is defined as first supplying a large non-MNE firm. Figure 6 shows the results from the falsification test. We do not find a post-event increase in multinational activity. This suggests that the results are not driven by generic demand shocks or firm growth associated with large customers, but are specific to linkages with multinational firms. Furthermore, the firm-destination analysis also suggest that size is not sufficient to explain our results: the firm-destination analysis shows that selling to an MNE

Figure 6: Event study: Falsification test.




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

with a subsidiary in country $c$ increases the likelihood of the supplier establishing an affiliate in the same country - which could not be the case if size was the main economic mechanism.

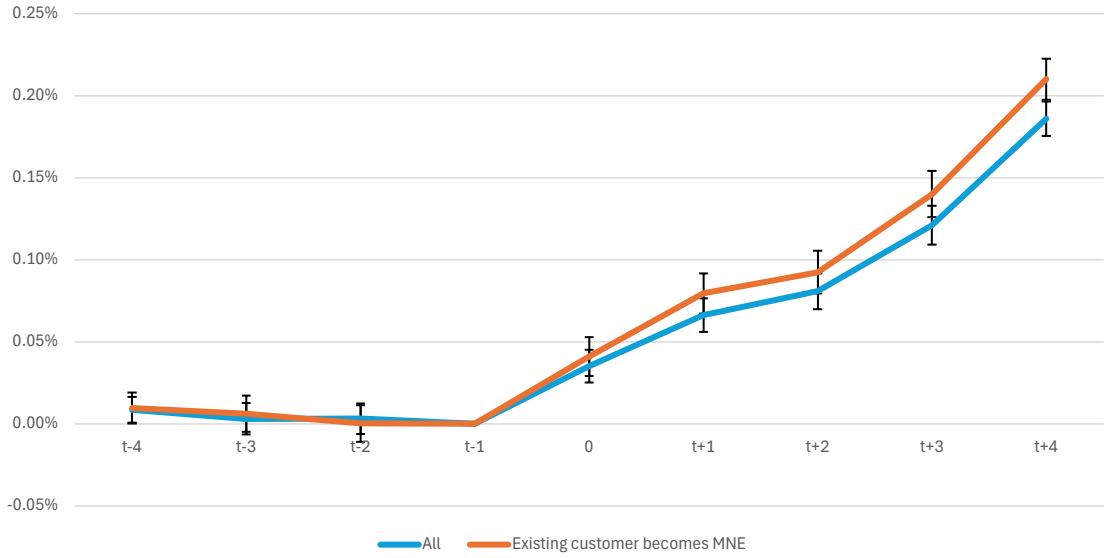
*Customers expanding abroad.* Another potential concern is that obtaining a new customer is not an exogenous event, and as such it may well be that MNE entry may trigger, so go together with, new domestic MNE customers. One way to address this is to refine the treatment to events where an existing customer becomes an MNE. Intuitively, this should be an more exogenous event from the point of view of the supplier. Figure 7 this robustness check, along with the baseline firm-level analysis. Reassuringly, the results are very similar. Again, we remind the reader that the firm-destination analysis also addresses this concern, because firm-year fixed effects will absorb any firm-wide shocks.

Finally, we show firm-level results excluding the never treated firms in Table 5. While the point estimates are more noisy, they confirm the overall pattern from the baseline model.

# 4 Model and Mechanisms

This section develops a simple model of follow FDI to discipline the interpretation of the empirical findings and to generate testable predictions. We then present empirical evidence

Figure 7: Event study: Existing customer becomes MNE




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

Table 5: Robustness: Drop Never-MNEs

| | Baseline | | No never-MNEs | |
|---|---|---|---|---|
| t-4 | 0.01 | (0.01) | 0.07 | (0.02) |
| t-3 | 0.00 | (0.01) | 0.03 | (0.01) |
| t-2 | 0.00 | (0.01) | 0.02 | (0.01) |
| t-1 | 0 | 0 | 0 | 0 |
| 0 | 0.04 | (0.01) | 0.03 | (0.01) |
| t+1 | 0.07 | (0.01) | 0.03 | (0.01) |
| t+2 | 0.08 | (0.01) | 0.04 | (0.02) |
| t+3 | 0.12 | (0.01) | 0.06 | (0.02) |
| t+4 | 0.19 | (0.01) | 0.09 | (0.03) |
| n | 7,718,288 | | 880,791 | |

**Notes:** Coefficients are multiplied by 100. Standard errors clustered at 2-digit industry-prefecture level.

consistent with the model's key mechanisms.

## 4.1 A Simple Model of Follow FDI

Consider a lead firm (the customer) and a supplier engaged in a vertical production relationship. The lead firm produces a final good using labor and a specialized intermediate input sourced from the supplier. We abstract from pricing details and market structure to focus on the supplier's location decision.

*Lead firm.* The lead firm has a Cobb–Douglas production function

$$Y = Al^{\alpha} z^{1-\alpha},$$

where $l$ denotes labor and $z$ denotes effective intermediate inputs. The parameter $1-\alpha$ captures the input intensity of the firm. If the lead firm and the supplier are co-located, one unit of the supplier's output translates one-for-one into effective input, so that $z = x$, where $x$ is the quantity supplied. If instead the lead firm relocates production abroad while the supplier remains at home, the intermediate input must be shipped internationally and is subject to iceberg trade costs $\tau > 1$.In that case, effective input usage is given by $z = x/\tau$.

Solving the lead firm's static cost-minimization problem yields optimal input demand. When the supplier remains at home, optimal demand satisfies

$$x^*_{stay} = x^*_{move} \tau^{-(1-\alpha)},$$

where $x^*_{move}$ denotes optimal input demand when the supplier also relocates abroad. Trade costs therefore reduce the lead firm's demand for the supplier's input when production is geographically fragmented, and this reduction is stronger the larger is the input share $1-\alpha$.

*Supplier.* The supplier faces a discrete location choice. If it stays at home, it exports intermediates to the lead firm and earns profits

$$\pi_{stay} = (p - c)\, x^*_{stay},$$

where $p$ is the input price and $c$ is marginal cost. If the supplier instead establishes a foreign affiliate in the lead firm's destination market, it avoids trade costs but must pay a fixed cost $F$ of multinational production. Profits from relocating are

$$\pi_{move} = (p - c)\, x^*_{move} - F.$$

The supplier follows the lead firm abroad whenever

$$(p-c)\, x^*_{move}\left(1-\tau^{-(1-\alpha)}\right) \geq F.$$

This condition highlights two forces that increase the incentive for follow FDI: (i) higher overall input demand by the lead firm, $x^*_{move}$, and (ii) a higher input share $1-\alpha$, which magnifies the loss in effective demand when the supplier remains at home.

## 4.2 Empirical Evidence on Mechanisms

First, we assess the prediction that suppliers are more likely to follow their customers abroad when the lead firm's demand for intermediates is high. Larger multinational customers generate greater gains from co-location. We split events based on the size of the multinational customer.[4] Specifically, we perform the firm-level event study and zoom in on suppliers that become first-time suppliers to large MNEs, defined as those in the top quartile of the MNE size distribution.

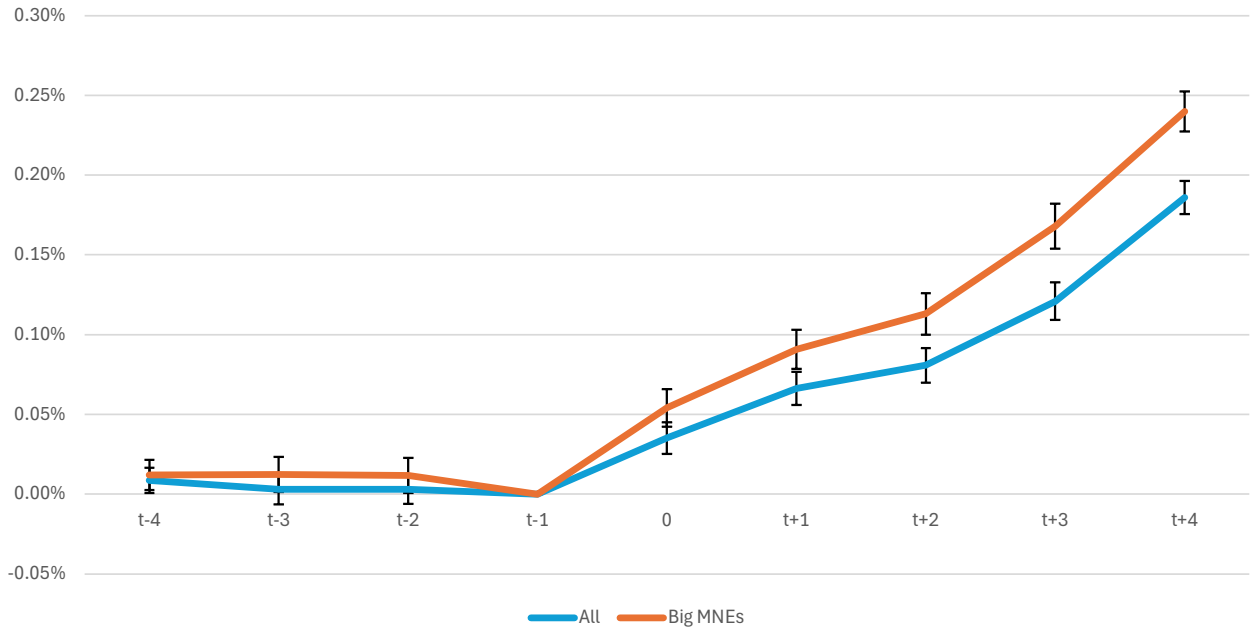
The results in Figure 8 show a substantially stronger post-event increase in the likelihood of becoming an MNE when the first MNE customer is large. Pre-event coefficients are close to zero in both groups, while post-event effects are approximately 50 percent larger for suppliers linked to large MNEs. This pattern is consistent with the model's prediction that higher input demand increases the returns to co-location.

Second, we test the prediction that follow FDI is more likely when the supplier's input accounts for a larger share of the lead firm's production costs. Higher input intensity amplifies the effective trade cost wedge and strengthens the incentive to relocate. To test this, we classify supplier–customer relationships by the input intensity of the lead firm. Specifically, we classify 2-digit industries into high- and low input-intensity based on the share of intermediates relative to sales of the industry. The top quartile across industries are defined as in input-intensive, and the bottom quartile low input-intensive. We then construct a firm-level event-study in which a supplier becomes a first-time customer of an MNE in those industries. Figure 9 shows that, consistent with the model, follow FDI effects are markedly stronger for suppliers linked to high input-intensity MNEs.

We end this section by testing whether suppliers are more likely to follow to countries where follow FDI is typically high. Recall from Figure 1 that we observe large differences in the follow FDI share across countries. To test this, we perform the firm-destination event

[4] Recall that we cannot measure input demand directly, because the firm-to-firm data does not include transaction value.

Figure 8: Large MNEs.




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

study using a subset of countries where the follow FDI share is high. [5] Figure 10 shows results for all firms and manufacturing firms. The point estimates are markedly higher compared to the baseline results in Figure 5.

In summary, the empirical patterns documented here closely align with these theoretical predictions, reinforcing the view that production networks play a first-order role in shaping the geography of multinational activity.

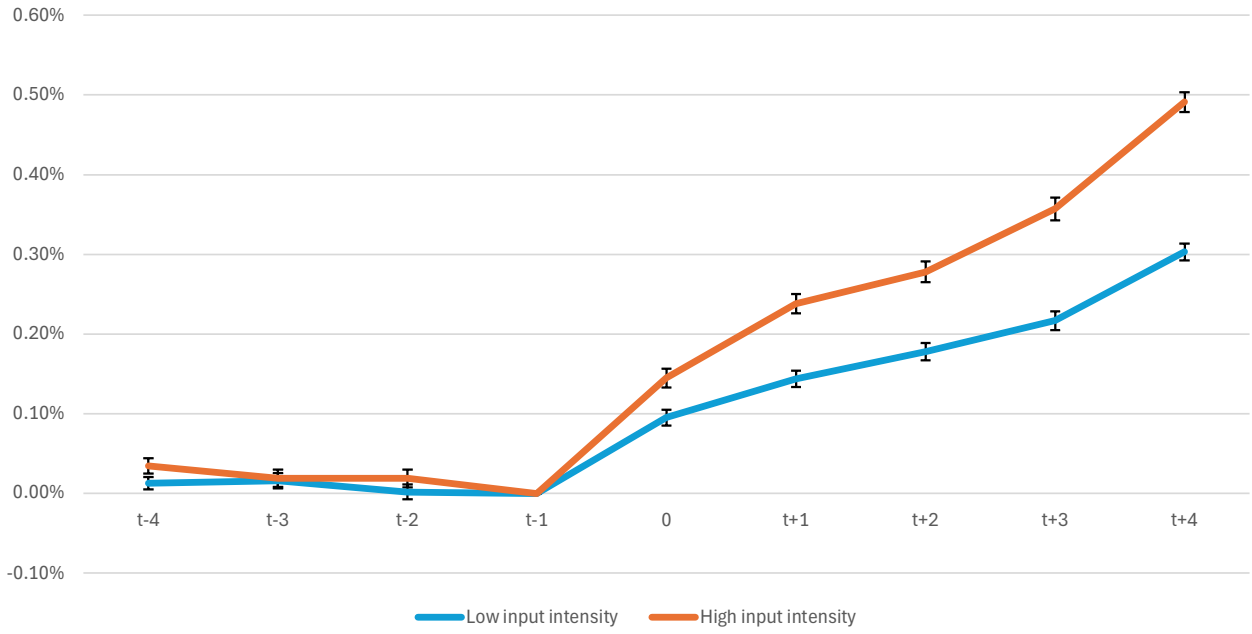
# 5 Conclusions

This paper studies follow FDI: the tendency of domestic suppliers to establish foreign affiliates after their multinational customers expand abroad. Using comprehensive firm-level data on Japanese multinational enterprises and domestic production networks, we document new stylized facts on the prevalence of follow FDI and provide causal evidence that supplying to multinational customers increases a firm's likelihood of becoming multinational itself.

Our empirical analysis proceeds in two steps. First, firm-level event studies show that

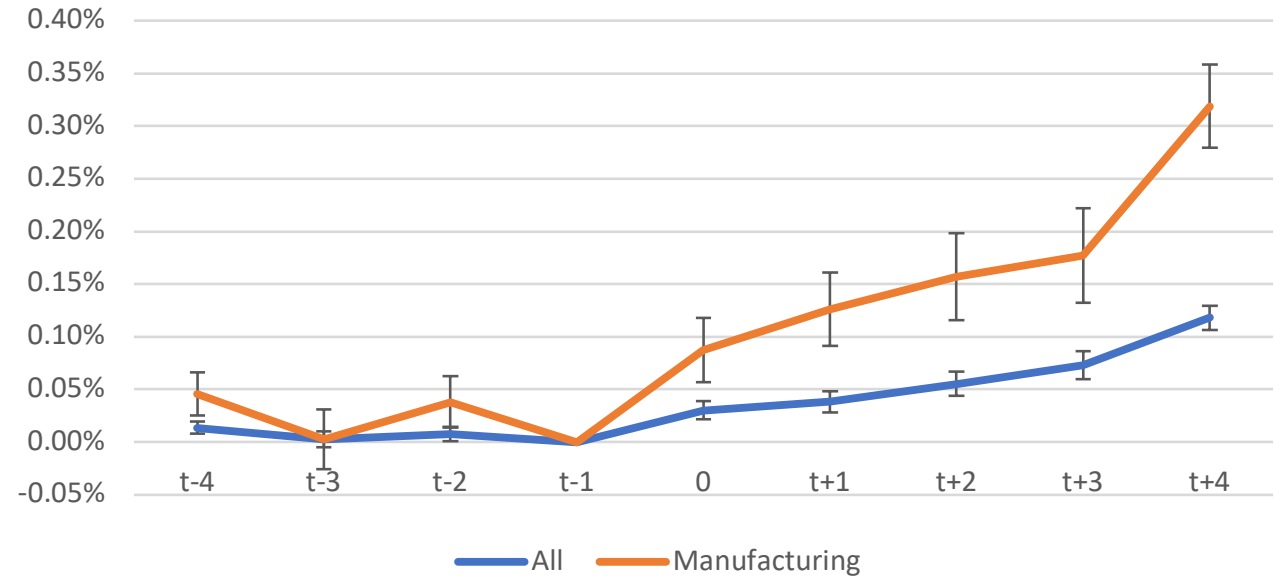
[5] We focus on countries where more than 40 percent of affiliates in manufacturing have a follow FDI share greater than 30 percent. The set of countries are: China, Czech Republic, India, Indonesia, Mexico, Philippines, Thailand and Vietnam.

Figure 9: High input-share customers.




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

Figure 10: High follow FDI countries




**Notes:** Standard errors clustered at 2-digit industry-prefecture level. Vertical bars are 95% confidence bands.

firms experience a sharp and persistent increase in multinational activity after becoming first-time suppliers to MNEs. These effects are economically meaningful, robust across specifications, and absent in placebo exercises based on supplying to large non-multinational firms. Second, firm-destination event studies exploit within-firm variation across countries and confirm that suppliers are more likely to establish affiliates precisely in the destinations where their multinational customers operate. By conditioning on firm-year fixed effects, this design rules out explanations based on firm-wide expansion shocks and provides direct evidence that customer-supplier linkages shape the geography of foreign direct investment.

To interpret these findings, we develop a simple model in which a supplier faces a trade-off between exporting intermediates at higher variable cost and paying a fixed cost to replicate production abroad. The model highlights two key forces that strengthen incentives for follow FDI: the scale of the customer's demand for intermediates and the input intensity of the production relationship. Empirical heterogeneity analyses strongly support both predictions. Follow FDI effects are substantially larger when suppliers link to large multinational customers and when inputs constitute a larger share of the lead firm's production costs.

Taken together, the results emphasize the central role of production networks in shaping multinational activity. Rather than viewing FDI decisions in isolation at the firm level, our findings point to a network-based perspective in which foreign investment propagates along customer–supplier relationships. This perspective has important implications for how we interpret "horizontal" FDI, for how domestic production networks condition firms' internationalization decisions, and for how inward FDI affects host economies. In particular, when follow FDI is strong, inward multinational activity may generate fewer spillovers to local firms, while at the same time amplifying the overall scale of foreign investment through network replication.

More broadly, this paper contributes to a growing literature that integrates production networks into international trade and investment. Understanding how global value chains shape the extensive margin of FDI is essential for assessing the consequences of globalization, supply-chain reorganization, and policies aimed at attracting multinational firms. Future work could embed follow FDI mechanisms into quantitative models of multinational production to assess their aggregate implications for trade patterns, investment flows, and welfare.

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