Multinational Linkages and Internal Reorganization in Supplier Firms: Evidence from Türkiye

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Abstract

When a domestic firm becomes a supplier to a multinational, how does it reorganize the work inside its walls? This paper studies the internal reorganization of supplier firms following the formation of multinational linkages, using administrative microdata from Türkiye. Becoming a multinational's supplier reshapes the occupational composition of the workforce: suppliers expand clerical and administrative employment, raising occupational diversity and the skill and task content of work. The resulting wage premium is an organizational effect rather than a mechanical consequence of scale. These results provide new evidence on a labor-market channel through which multinational linkages upgrade firm organization in a middle-income economy.

Keywords: Multinational enterprises; firm-to-firm linkages; internal organization; occupational composition.
JEL Codes: D22, F23, J24, L23, O14.

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1 Introduction

"Whether links to central firms primarily transmit information or confer other advantages is an important question. Our analysis does not impose a priori restrictions on the underlying mechanism. Instead, we exploit the fact that informational channels are expected to operate primarily on the extensive margin—export entry and the expansion into new markets—while alternative channels such as financing or scale advantages would mainly affect post-entry quantities or prices. Consistent with an informational interpretation, we find that exposure to central firms strongly predicts export entry and the number of new destination markets, with comparatively weaker effects on post-entry sales volumes and prices. Moreover, these effects are more pronounced for harder-to-enter markets, where informational frictions are plausibly more severe."

Related Literature. This paper contributes primarily to three strands of literature. First, it speaks to an extensive literature on the domestic effects of foreign direct investment (FDI). That multinationals offer "good jobs" is well established: foreign-owned firms and their affiliates are more productive and pay more than their domestic counterparts (Aitken et al., 1996; Heyman et al., 2007; Hijzen et al., 2013).[1] A large literature shows that this premium spills over to the host economy, both through worker mobility and through supply chains: workers who acquire skills inside multinationals carry them to the domestic firms that they later join (Balsvik, 2011; Poole, 2013), and the domestic firms drawn in as suppliers grow larger and more productive (Javorcik, 2004; Alfaro-Urena et al., 2022). Beyond the wages that multinationals pay directly, their presence raises wages in equilibrium by improving workers' outside options (Alfaro-Ureña et al., 2021; Setzler and Tintelnot, 2021). Yet far less is known about how suppliers reorganize their workforce in response to these linkages. We show that they do so largely through a shift in occupational composition, driven by rising demand for white-collar workers.

Second, we contribute to a long-standing literature on the internal organization of firms. The idea that the division of labor drives economic growth dates back to Smith (1776); its modern formulations stress the role not only of market size (Stigler, 1951), but also of coordination costs and the acquisition of knowledge (Becker and Murphy, 1992; Garicano, 2000; Garicano and Rossi-Hansberg, 2004).[2] A growing body of evidence shows that scale, trade, and development reshape this division of labor. Within firms, larger and exporting plants employ more occupations

[1] See the review articles by Javorcik (2015), Hale and Xu (2016), and Garetto et al. (2025). Higher wages are only one dimension of "good jobs"; multinational firms also tend to provide above-average training opportunities, stronger wage growth, and more generous non-wage benefits (Görg et al., 2007; Malchow-Møller et al., 2013).

[2] For a review on knowledge-based hierarchies, see Garicano and Rossi-Hansberg (2015).

and assign fewer tasks to each (Becker et al., 2025), and reorganize their hierarchy by adding or dropping management layers (Caliendo and Rossi-Hansberg, 2012; Caliendo et al., 2015, 2020). Across firms, growth leads firms to reallocate tasks to specialized suppliers, so that linked firms grow less occupationally similar (Arnarson et al., 2026). And across regions and countries, occupational variety expands with development (Bandiera et al., 2022; Heil and Leite-Mariante, 2026).

Within the firm, this reorganization is also skill-biased, raising the relative demand for skilled labor (Caroli and Van Reenen, 2001; Bresnahan et al., 2002; Bartel et al., 2007; Berman et al., 1994; Feenstra and Hanson, 1999). Management itself enters on two margins. As a productive, transferable technology (Bloom et al., 2021; Giorcelli, 2019), it deepens the *supervisory* hierarchy, and it builds a professionalized *administrative* apparatus—planning, quality, accounting—for new tasks. A multinational linkage especially demands the administrative one: because quality is hard to contract on, the relationship rests on relational rather than formal terms (Baker et al., 2002; Macchiavello and Morjaria, 2015; Nunn, 2007), sustained through administrative rather than supervisory work.[3] Existing firm-level evidence, however, comes largely from advanced economies, where this apparatus is already in place. We instead study Türkiye, where multinational and supplier operate within the same domestic jurisdiction; this separates the standards a multinational brings from the weak cross-border enforcement with which they are usually confounded (Boehm and Oberfield, 2020).

Finally, this paper contributes to the literature on firm dynamics in developing countries. Such firms tend to be smaller, less productive, and organizationally thinner than their counterparts in rich economies, adopting weaker management practices and delegating little beyond the founding family (Bloom et al., 2010, 2013; Ulyssea, 2018; Akcigit et al., 2021).[4] A growing body of work shows that international integration can help them upgrade, raising productivity and quality (Verhoogen, 2008; Atkin et al., 2017), and pulling production out of informality and into the formal sector (McCaig and Pavcnik, 2018; Bas and Bombarda, 2026). We pick up where formalization leaves off: looking inside the now-formal supplier with administrative employer–employee data, we identify who staffs the administrative jobs it builds, uncovering the labor-market channel through which multinational linkages reshape firm organization.

[3] On the incomplete-contract and relational-contract foundations and their role in trade and development, see (Grossman and Hart, 1986; Macaulay, 1963; MacLeod and Malcomson, 1989; Levin, 2003; Banerjee and Duflo, 2000; Antràs and Foley, 2015; Defever et al., 2016; Macchiavello, 2022).

[4] For reviews of this literature, see Tybout (2000) on the performance of manufacturing firms in developing countries, Ulyssea (2020) on informality, and Verhoogen (2023) on firm-level upgrading.

The remainder of the paper is organized as follows. Sections 3 and 4 describe the data sources and empirical strategy. Sections 5 and 7 report the main findings and a range of robustness exercises. Section 8 concludes.

2 Stylized Facts

3 Data

Our analysis combines three administrative datasets from the Turkish Ministry of Industry and Technology (MoIT). Collected for tax administration purposes, these datasets cover the near-universe of firms and workers in the *formal* economy and can be linked through anonymized firm and worker identifiers. We complement these records with an externally constructed list of multinational enterprises (MNEs) operating in Türkiye and occupation-level task measures from the O*NET database.

3.1 Administrative Datasets

Matched Employer-Employee Records. The matched employer-employee records are derived from the Social Security Administration (*Sosyal Güvenlik Kurumu*, SGK) filings held within the MoIT's Entrepreneur Information System (EIS). Each observation identifies a worker–firm pair in a given quarter and reports the worker's four-digit ISCO occupation code, gross earnings, days of insured employment (premium days), daily wage, age, and sex. Data are available from 2012 onward. However, four-digit occupation codes, which are essential for our organizational analysis, are only reliably recorded from 2015 onward. The reporting frequency of the SGK data changed over time: records up to 2018 are filed at quarterly frequency, while from 2019 onward the data are reported monthly. We aggregate all records to a uniform quarterly frequency to maintain consistency across the sample period and to align with the periodicity of the VAT transaction data. Each worker carries a unique anonymized identifier that is consistent across employers and over time, enabling us to track individuals across firms. For firm-level analysis, we aggregate the worker-level records to the firm-quarter level and construct measures of total employment, average wages, and occupational diversity, defined as the number of distinct occupations observed within the firm.

Firm-to-Firm Transactions. Firm-to-firm transaction data are derived from value-added tax (VAT) returns. Each record reports the seller, buyer, reporting period, and total transaction

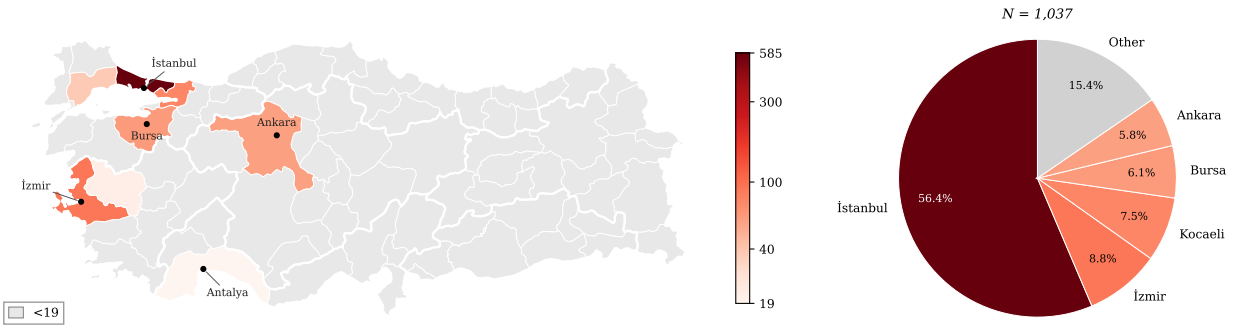
value for a given pair in a given month. We use VAT records from 2010 through 2019, when reporting thresholds were stable at 5,000 Turkish Liras (approximately USD 840 in 2019), and aggregate transactions to the firm-pair-quarter level. The longer time coverage of the VAT data provides a four-year lead-in period before the start of our analysis window, allowing us to distinguish genuine first-time MNE suppliers from firms with pre-existing supplier relationships that would otherwise be unobserved. We use the VAT data in two ways. First, we identify the first quarter in which a firm records positive sales to any firm on our MNE list, which defines the extensive-margin treatment event. Second, we compute both the share of sales accounted for by MNE customers and the level of MNE sales in each quarter, which together capture variation in treatment intensity.

Firm Balance Sheets and Income Statements. The MoIT data include annual balance sheets and income statements filed by all firms under the Turkish Uniform Chart of Accounts (*Tekdüzen Hesap Planı*), giving detailed asset, liability, equity, revenue, and cost positions for each firm-year. The income statement decomposes gross sales into domestic and international sales. The associated firm registry records each firm's province, industry, legal form, foundation year, and quarterly employment and wage totals.

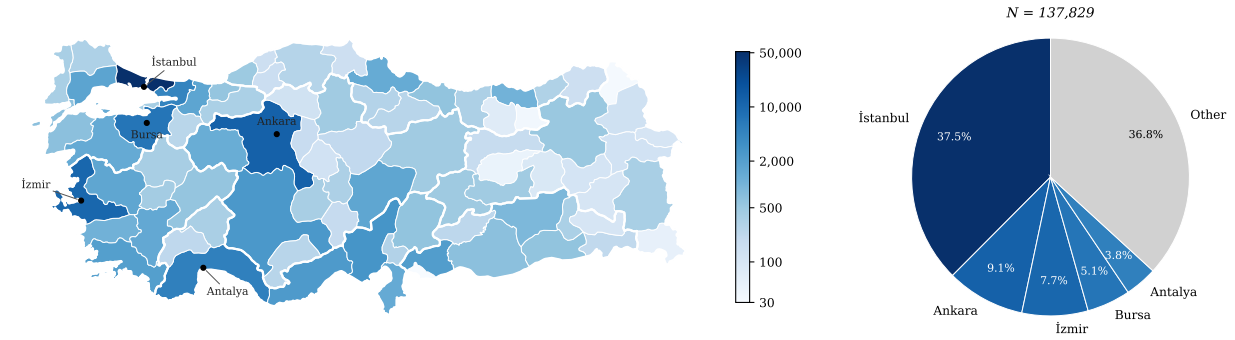
3.2 Multinationals in Türkiye

3.3 O*NET Task and Knowledge Measures

4 Empirical Strategy



(a) Multinational enterprises



(b) Domestic supplier firms

Figure 1. Geographic distribution of MNEs and their domestic suppliers

Notes: Each panel maps the count of firms by province (left) alongside the share held by the five most concentrated provinces (right). Panel (a) covers large MNEs; panel (b) covers domestic firms entering an MNE supply chain for the first time during 2014Q1–2021Q4.

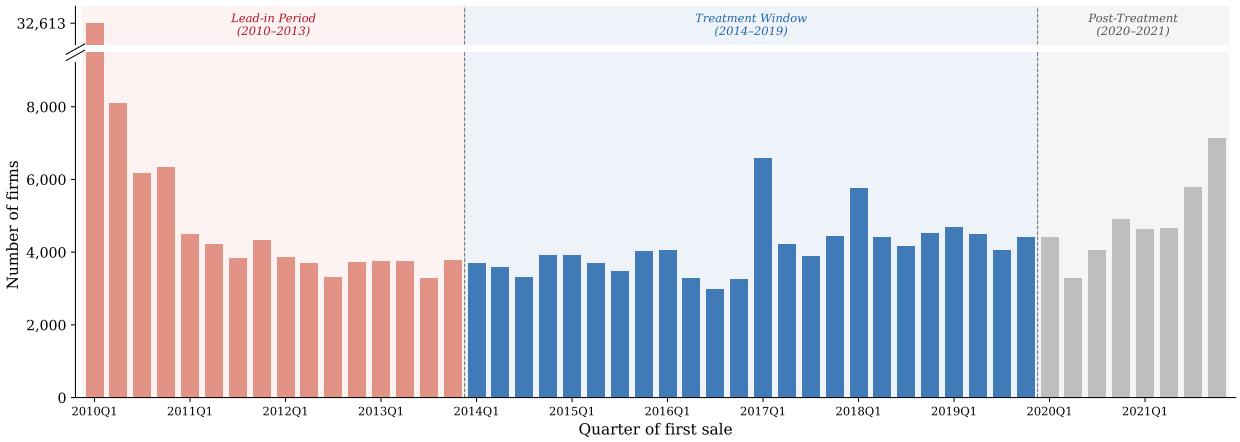


Figure 2. Distribution of first-time MNE suppliers by treatment cohort

Notes: Each bar shows the number of firms whose first sale to an MNE occurred in that quarter. The lead-in period (2010–2013) is used to confirm that treated firms had no prior MNE linkages. Treatment cohorts entering during 2014Q1–2019Q4 form the estimation sample.

5 Firm-level Results

Table 1. MNE Supplier Effects on Employment, Wages, and Occupational Diversity

	ln(Employment)	ln(Avg Wage)		ln(ISCO Count)	
	(1)	(2)	(3)	(4)	(5)
Treated × Post	0.179***	0.016***	0.022***	0.189***	0.130***
	(0.003)	(0.0008)	(0.0008)	(0.002)	(0.002)
ln(Employment)			−0.034***		0.327***
			(0.0004)		(0.0005)
Firm FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
R^2	0.738	0.722	0.723	0.684	0.744
Firms	849,188	848,926	848,926	838,998	838,998
Observations	12,130,971	12,118,672	12,118,672	10,973,346	10,973,346

Notes: Each column reports a separate TWFE regression of the column outcome on a treatment indicator, with firm and period fixed effects. Treatment is defined as any positive sale to a large MNE (extensive margin). Standard errors clustered at the firm level in parentheses. Columns (3) and (5) add log employment as a control to isolate the organizational channel from mechanical scale effects. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Box 1: Bad Controls and Size-Adjusted Estimation

As a first pass at separating the scale channel from organizational restructuring, columns (3) and (5) add log employment as a control. Because employment is itself affected by treatment, this specification should be interpreted as a descriptive decomposition rather than a causal estimate of the size-conditional effect; Section **??** addresses this concern using residuals constructed from the never-treated sample.

6 Worker Flows

7 Robustness Checks

8 Conclusion

Table 2. MNE Supplier Effects on Task Content

	Analytical	Interpersonal	Rtn Cognitive	Rtn Manual	NR Manual
	(1)	(2)	(3)	(4)	(5)
Panel A: No employment control					
Treated × Post	−0.006***	−0.003**	0.005***	0.006***	0.008***
	(0.001)	(0.001)	(0.0009)	(0.001)	(0.001)
Panel B: Controlling for ln(employment)					
Treated × Post	−0.001	−0.001	0.005***	−0.007***	−0.009***
	(0.001)	(0.001)	(0.0009)	(0.001)	(0.001)
ln(Employment)	−0.028***	−0.011***	−0.003***	0.076***	0.090***
	(0.0004)	(0.0004)	(0.0003)	(0.0004)	(0.0005)
Firm FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
R^2 (A)	0.715	0.715	0.675	0.741	0.726
R^2 (B)	0.716	0.715	0.675	0.746	0.731
Firms	839,294	839,294	839,294	839,294	839,294
Observations	11,698,663	11,698,663	11,698,663	11,698,663	11,698,663

Notes: Each cell reports the coefficient on the treatment indicator from a separate TWFE regression with firm and quarter fixed effects. Treatment is defined as any positive sale to a large MNE (extensive margin). Panel A includes no additional controls. Panel B adds log employment. Standard errors clustered at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

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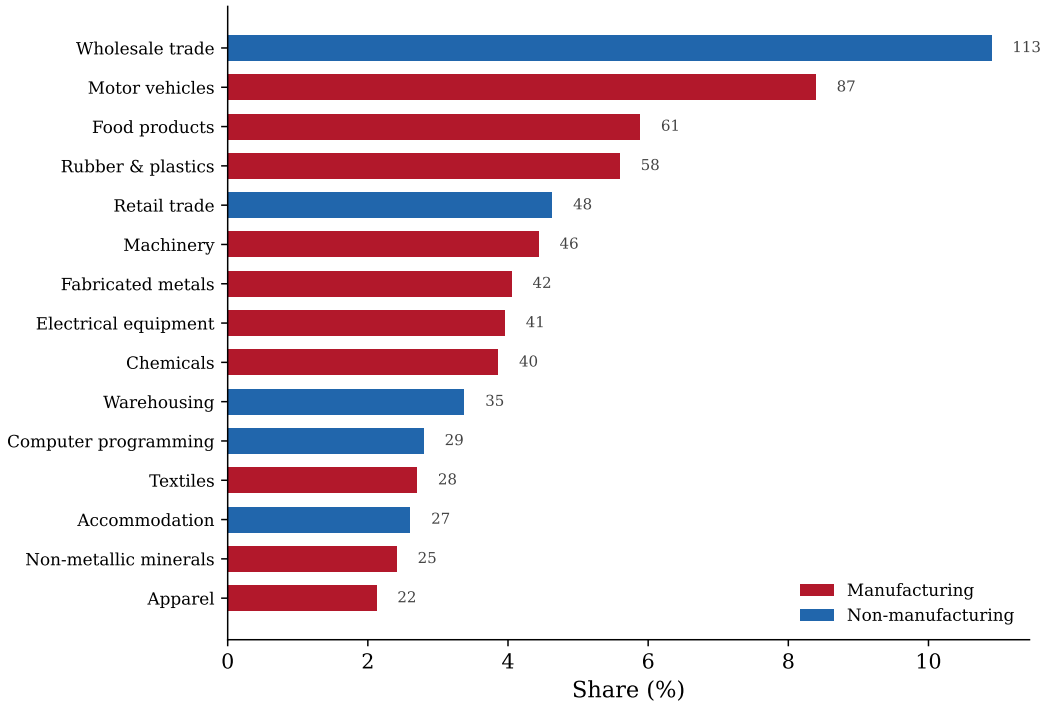
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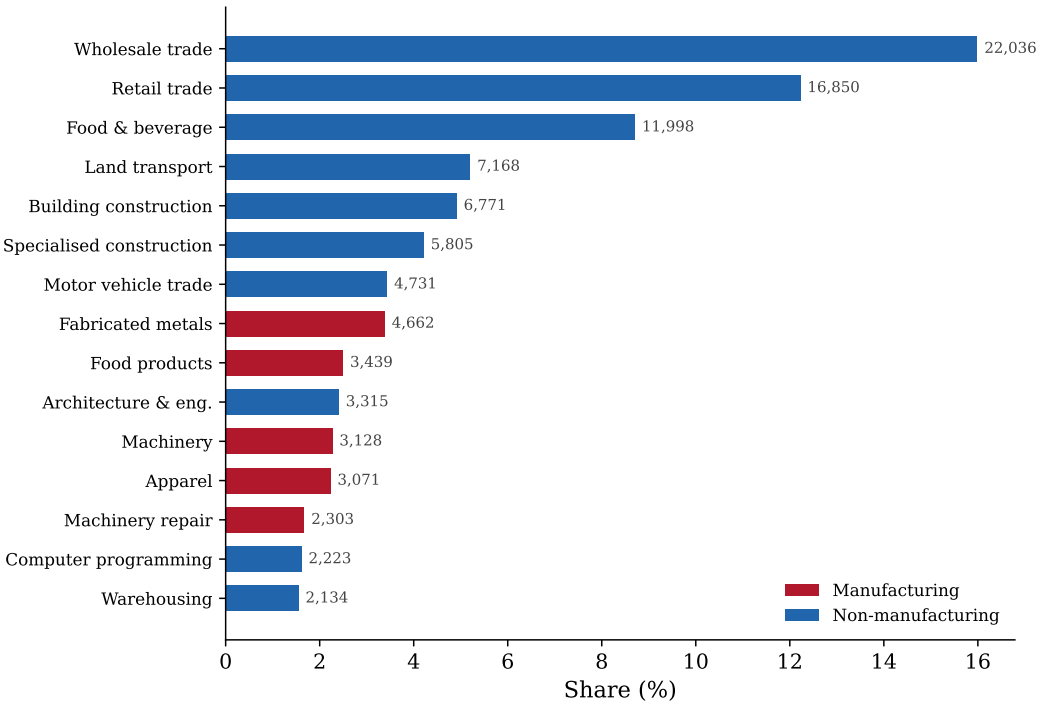
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A Additional Figures and Tables



(a) Multinational enterprises



(b) Sectoral composition of MNEs and their domestic suppliers

Notes: Each bar shows a NACE 2-digit division's share of firms within the group, restricted to the 15 largest divisions. Panel (a) covers large MNEs; panel (b) covers domestic firms entering an MNE supply chain for the first time during 2014Q1–2021Q4. Bars are coloured by broad sector: manufacturing in red and non-manufacturing (trade, construction, transport, and services) in blue.