BANCA D'ITALIA

EUROSISTEMA

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MULTINATIONAL ENTERPRISES IN ITALY: INSIGHTS FROM FIRM-LEVEL DATA

by Gianmarco Cariola*, Giovanni Battista Carnevali*, Andrea Linarello*, Francesco Manaresi*, Litterio Mirenda*, Emanuele Russo*, Matteo Sartori* and Gianluca Viggiano*

Abstract

This paper assesses the economic significance of multinational enterprises (MNEs) in the Italian business sector. Using a novel database that integrates various sources of information on firm ownership and activities between 2010 and 2022, we present several key insights regarding MNEs. MNEs account for one-fifth of employment and over 35% of value added, with marked differences between Northern and Southern Italy. Even after accounting for sectoral and geographic specialization, MNEs are shown to be larger and more productive than non-MNEs. We also provide evidence of a substantial wage premium associated with MNEs. Over the past decade, MNEs have contributed more than proportionately to the growth in firm size observed in Italy. They are also found to be more innovative and more export-oriented, partly because of intra-group trade.

JEL Classification: F23, F43, L25.

Keywords: multinational firms, economic growth, wage premium, intra-group trade.

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1. Introduction[1]

In the last decades, the global economy has been significantly shaped by the emergence and the expansion of multinational enterprises (MNEs). According to OECD estimates, MNEs generate roughly one third of world GDP and almost two thirds of global trade (Miroudot and Rigo 2021). FDI flows increased by 70 percent to about 1.3 trillions USD over the last two decades. Over the period, multinationals have contributed also to the internationalization of innovative activity. Cross-border R&D investments are estimated to have nearly doubled between 2003 and 2017 to 34.4 billion USD (Crescenzi et al. 2022).[2]

MNEs boost local economic growth both directly and indirectly. MNEs are generally more productive than domestic firms (Keller and Yeaple 2009, Bentivogli and Mirenda 2016) and, thus, they directly support productivity growth in the economy in which they locate. MNEs can also have indirect impacts by generating spillovers on suppliers (Javorcik 2004, Amiti et al. 2023) and by increasing the competition faced by domestic firms (Davies and Markusen 2021, Alfaro and Chen 2018).

Besides these positive impacts, MNEs have also been looked at with some concerns. First, it has long been argued that they may be inherently footloose, i.e. they could swiftly react to adverse changes in the host countries by shifting their production to other countries (Gorg and Strobl 2003, Van Beveren 2007). Indeed, existing evidence shows that MNEs are more likely to exit the local market than domestic firms when local conditions change (Blanchard et al. 2015), and that they are highly sensitive to institutional features (notably, the corporate tax rate; Egger et al., 2020). Second, given their size, MNEs may benefit from monopsonistic power in local labor markets, potentially affecting the welfare of workers (Mendez and Van Patten 2022).

In Italy, there is a growing interest on the role of MNEs in supporting economic activity and local development. Recently the Italian Statistical Institute (Istat) has strengthened its capabilities to monitor MNEs within its integrated database on firms' activities (Frame-SBS). The Italian Industrial Association (Confindustria) has partnered with Istat to create a yearly report on the state of foreign owned multinationals in Italy.

In this paper we provide an assessment of the economic relevance of MNEs in the Italian non-agricultural and non-financial business sector. We leverage both aggregate information from Frame-SBS between 2017 and 2021 (latest available year), as well as from a novel database that we build by integrating information on

[1] We thank Marta Crispino and Francesco Paolo Conteduca for helping us with the firm-to-firm export data. We thank Nadia Accoto, Stefano Federico, Andrea Lamorgese, Enrico Sette and Roberto Torrini for useful comments.

[2] Data on cross-border R&D investments are computed by Crescenzi et al. (2022) using information from fDi Market on greenfield investments only in the following fields: *Design, Development & Testing, Education & Training*, and *Research & Development*.

firm's ownership, balance sheets, export activity, patents, and matched employer-employee data between 2010 and 2022, that allow us to provide eight key facts on MNEs.[3]

First, MNEs account for a large share of employment and value added: between 2017 and 2021 they represent less than 3 percent of establishments, while employing around one-fifth of workers and generating more than 35 percent of value added. Slightly more than half of these shares accrue to domestic MNEs, the rest to foreign owned MNEs. There is considerable geographic heterogeneity in the relevance of MNEs on local economies. Frame-SBS data providing the regional distribution of establishments, employees and value-added show that, in the South, MNEs employ just one tenth of workers and generate one-fifth of value added, with a larger share of domestic MNEs relative to foreign ones.[4]

Second, compared to their low incidence in terms of establishments, MNEs contributed disproportionally to the growth of firm size experienced in Italy over the last decade. MNEs contribution can stem from the growth in their number (extensive margin) and from the growth in their size (intensive margin). Between 2010 and 2016 the average firm size in the Italian business sector increased by 0.5 employees: the extensive margin of MNEs explains over 64 percent of such increase (or 0,3 employees). In the following 7 years, firm size increased by 1.1 employees. The extensive margin contributed by 0,3 employees (or 31 percent of total growth), the growth of MNEs' size by 0,1 employees (MNEs increased their average size from 117 to 123 employee), while the largest contribution stemmed from the intensive margin of non-MNE firms.

Third, there is wide sectoral heterogeneity in the relevance of MNEs, ranging from around 80 percent of value added in the mining and quarrying sector to less than 20 percent in accommodation and food service activities. In manufacturing, the share of value added accruing to MNEs ranges between around 80 percent in the coke and pharmaceuticals industries to less than 40 percent in the production of wood and paper products.

Fourth, using firm level data we document that MNEs are on average 130 percent larger in terms of employees with respect to firms belonging to similar sectors and regions. Moreover, conditional on size, they earn 50 percent higher revenues, generate over 30 percent higher value added, have higher tangible and intangible capital, and they have higher investment rates. Domestic MNEs differ with respect to foreign MNEs in that they are relatively smaller in terms of employment, revenue, and value added, while being larger in terms of material and immaterial assets.

Fifth, MNEs are also more productive, along a rich set of productivity measures (i.e. labor productivity, and two measures of revenue-based TFP): after controlling for their size, capital intensity, and sectoral and regional distribution, labor productivity is almost 27 percent higher, and revenue-based TFP differentials

[3] For an earlier analysis of the trends of FDI and MNEs in Italy over the period 1990-2012, see Borin and Cristadoro (2014)

[4] Studying the regional distribution of establishments, employment and value added, we find that the incidence of MNEs on the local economy is relatively uniformly low across all Southern regions. See the discussion in Section 3 and Figure A1 in the Appendix.

amounts to 12 percent in our preferred estimates that control for differences in the quality of labor inputs. Foreign MNEs are found to be more productive than their domestic counterparts.

Sixth, using matched employer-employee data, we document that the daily wage paid by MNEs is on average (unconditional to sectoral, regional and size differences) 30 percent higher than that paid by other firms. Once sectoral, regional and size differences are taken into account, the wage premium remains positive but drops to 14 percent, roughly half of the estimated productivity premium. The wage premium is higher among white-collars than among blue-collars, while being almost absent among middle-managers, and characterized by a large sectoral variability. The wage premium is also found to be smaller in domestic MNEs relative to foreign ones.

Seventh, MNEs are more innovative than other Italian firms and account for a large share of patenting activity. More than 50 percent of Italian patent applications are filed by multinationals[5], and there is a huge geographical divide: over 90 percent of patents are filed by firms located in the Center-North (a share similar across both MNEs and non-MNE firms). The number of patent applications filed by MNEs increases by roughly one-fifth once we take into account the inventions made by Italian residents and filed by foreign affiliates, as it happens in cases in which a foreign firm carries out R&D activities in Italy and registers the patent at its headquarters abroad.

Eighth, MNEs are more likely to export. They account on average for over 60 percent of total exports over the period 2010-22, their importance increased over time from 57 to 62 percent.[6] The large contribution to export is partially explained by sales to other affiliates of the multinational group (intra-group trade), which accounts for around one-third of their MNEs exports. Intra-group trade is particularly relevant among foreign MNEs, accounting for almost 50 percent of their total exports, while it represents one-fifth of trade for domestic MNEs.

The remainder of the paper is structured as follows. Section 2 provides the definition of MNE used throughout the note and gives an overview of the data used. Section 3 offers evidence on the economic relevance of MNEs in the Italian economy, focusing also on the regional divide between Center-North and South Italy. Section 4 characterizes MNEs, discussing their sectoral specialization and their productive structure (its labor and capital intensity, the role of intangible assets, its productivity and wage premia). Sections 5 and 6 present key facts related to, respectively, MNEs' innovative activities and internationalization. Section 7 discusses further and ongoing researches and concludes.

[5] In patent data, the geographic origin is based on the country of residence of the first applicant listed on the application form (first-named applicant principle). In cases where several applicants are mentioned on the application form, the country of residence of the first applicant listed applies.

[6] Preliminary analyses on import data show that MNEs account for around 60 percent of total imports over the period 2010-2021. See Section 6 and Figure A8.

2. Definition of MNEs and data

According to EUROSTAT definition, a multinational enterprises (MNE) is a firm producing goods or delivering services in more than one country. A multinational enterprise has its management headquarters in one country, the home country, while also operating in other countries, the host countries. Often firms that operate in different countries are independent legal entities but share the same Global Ultimate Owner (GUO), they belong to the same multinational group. The GUO is the legal entity holding more than 50% of the shares of the firms, either directly or indirectly through intermediate companies controlled by an absolute majority. The nationality of the multinational group is defined according to the location of the GUO.

In this paper we use two main data sources, each of which provide its own identification of MNEs. The first one, Frame-SBS, is a database managed by Istat and identifies multinationals through two main sources of information: the list of shareholders and the profiling of very large MNEs. The second data source is Orbis Historical, a proprietary database managed by Moody's. Orbis collects information on the shareholders of around 300 million firms from over 200 countries worldwide. It identifies the GUO by exploiting the list of shareholders of each firm.

Throughout the analysis, we focus on the private non-agricultural and non-financial business sector.[7]While Frame-SBS and Orbis Historical share the same definition of MNE, there are two main differences in the way they identify MNE groups and their location: how they identify the chain of controls within MNEs and the identification of foreign and domestically owned MNEs.[8] In Section 2.1, we assess the relevance of these two differences by looking at aggregate figures of MNEs according to Orbis Historical and Frame-SBS.

Frame-SBS data are available to the general public only with a regional breakdown, through Istat yearly reports "Conti economici delle imprese e dei gruppi di imprese", that currently provide information from 2017 to 2021. We exploit this data in Section 3 to assess the economic relevance of MNEs and its North-South variability. Sectoral data are only available from 2019 onwards, and with a very coarse distinction between manufacturing, other industries, trade, and other services: we, thus, exploit Orbis Historical data for the sectoral analysis.

Orbis Historical allows to analyze MNEs both at the micro and macro level exploiting firm-level data over the period 2010-2022. For this purpose, we integrate this database with several data sources. In Section 3, to

[7] That is, focusing on NACE rev.2.2 industries, from letter B (mining and quarrying) to letter N (administrative and support service activities), with the exclusion of letter K (financial and insurance activities). For a list of NACE rev.2.2 sectors, see https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF.

[8] First, the two sources differ in how they treat a particular configuration of the network of ownership (a specific type of indirect control). Consider two firms B and C that own 30% of firm D each. They are both owned by a firm A. According to Frame-SBS, firm A is the GUO of B, C, and D. Conversely, the algorithm of Orbis Historical only moves upward through the ownership structure and, hence, identifies A as the GUO of B and C only. A second difference between the two regards the identification of foreign and domestically owned MNEs. In Orbis, we can identify the location of the owner by looking at the country to which the GUO company belongs. Frame-SBS, conversely, combines ownership information with data on board composition and the governance structure of the company, as well as profiling activities for the largest MNEs.

study the role of MNEs in explaining the increase in the size distribution of firms, we combine Orbis Historical with data, administered by the National Social Security Institute (INPS), on the employment of all firms with at least one employee. To characterize MNEs' production and their productivity and wage premium, in Section 4, we integrate Orbis Historical with data on firm balance-sheet collected by CERVED Group and with matched employer-employee data administered by INPS. The former provides detailed balance-sheets of the universe of incorporated firms, the latter covers a sample of workers born in 24 dates (each 1st and 9th day of the month). In Section 5, we combine Orbis Historical with patent data from several sources: a match of patent filed by Italian firms provided by the Italian Chambers of Commerce (Unioncamere), with information on the priority date of each patent filed by an Italian firm between 2018 and 2019,[9] together with the location of each inventor, and a match of worldwide patents provided by Orbis along with OECD-REGPAT to collect information on patent filed by Italian inventors by claimed by foreign firms. Finally, in Section 6, we merge Orbis Historical with data from the Italian Custom Agency related to the export activities of each Italian firm over the period 2010-2022. Henceforth, we refer to the data infrastructure that combines these different data sources as Integrated Multinational Enterprises Database (IMED).

2.1 A comparison between ASIA-Frame and Orbis Historical

We study the implications of the differences in the methodologies of Frame-SBS and IMED by comparing information available from both databases at the national and regional levels.

At the national level, we can compare the number of firms and aggregate value added of MNEs according to the two databases. In 2021, according to IMED data, there were 12,526 active firms belonging to foreign MNEs in Italy and 14,180 to domestic MNEs. These correspond to –respectively- 87 and 84 percent of the values reported by Frame-SBS. These shares remained broadly constant over the 2017-2021 period.

Figure 1 shows the ratio between aggregate value added according to IMED and Frame-SBS. In 2018-19 the ratio remains roughly similar between foreign and domestic MNEs at around 80-83 percent, while in 2020 there is an increase in the ratio of foreign MNEs, accompanied by a reduction in that of domestic MNEs. This may be driven by some large firms that move their GUO according to Orbis Historical, while remain under domestic control according to the profiling activity made by Istat.

At the regional level, we can compare only employment between the two datasets. Table 1 provides the ratio IMED-to-Frame for all Italian regions in 2021. Besides few cases (marked in red), all ratios are set between 80 and 110 percent. Notably, there are no remarkable differences in these ratios between foreign and domestic MNEs.

[9] The priority date is the date since which the intellectual property is guaranteed.

All in all, the comparisons performed so far seem to indicate that IMED generally underestimates the weight of MNEs by roughly 10-15 percent in comparison to Frame-SBS. Discrepancies in value added of foreign and domestic groups are larger, particularly from 2020 onwards.

Figure 1. Ratio (%) of value added of MNEs in IMED relative to value added of MNEs in ASIA-Frame

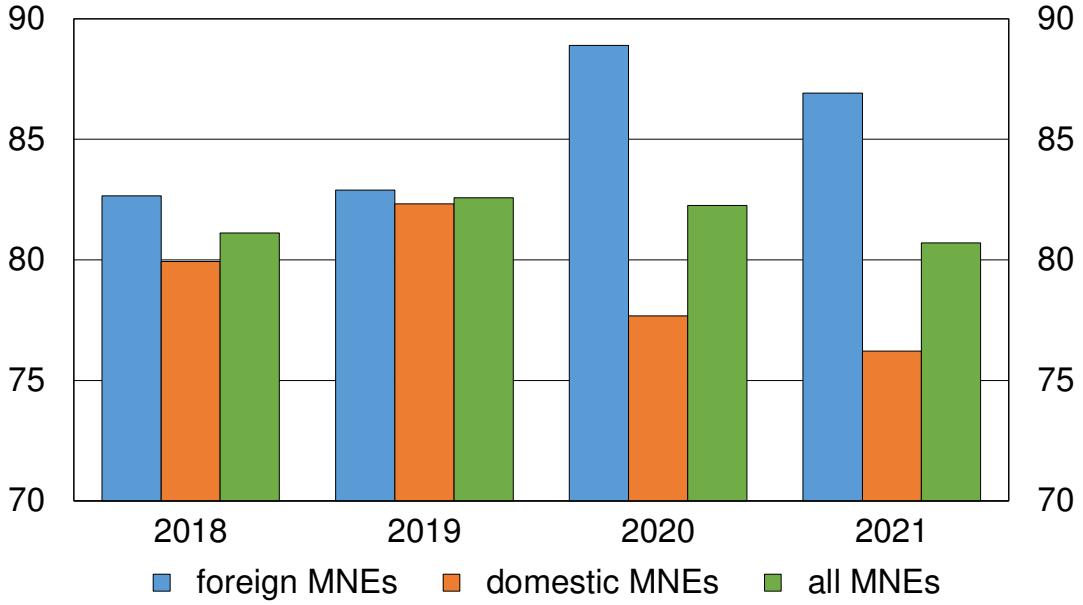


Table 1. Ratio (%) of employment in MNEs in IMED relative to employment in MNEs in ASIA-Frame

	Foreign MNEs	Domestic MNEs	All MNEs
Abruzzo	76,8	97,1	86,1
Alto Adige	91,4	99,9	96,1
Basilicata	105,7	87,7	97,9
Calabria	64,7	89,5	82,1
Campania	103,3	93,1	97,3
Emilia-Romagna	102,7	94,3	97,3
Friuli-Venezia Giulia	99,9	94,4	96,6
Lazio	91,1	109,6	100,1
Liguria	66,9	94,3	80,1
Lombardia	96,7	101,1	98,7
Marche	97,0	89,0	91,5
Molise	91,9	99,6	95,6
Piemonte	104,1	95,1	99,8
Puglia	95,7	89,2	92,1
Sardegna	76,4	87,4	82,4
Sicilia	98,9	90,5	93,3
Toscana	93,8	90,3	91,9
Trentino	90,8	100,2	96,1
Umbria	104,2	90,2	95,2
Valle Aosta	121,0	61,4	89,3
Veneto	96,3	101,6	99,5
Italy	**95,8**	**97,6**	**96,8**

3. The economic relevance of MNEs in Italy

This section provides some key insights on the relevance of MNEs in the Italian economy. First, it shows that MNEs account for a large share of employment and value added, and how the incidence of MNEs on local economies vary markedly between the Center-North and the South of Italy. Second, it gives novel evidence on how MNEs contributed to the growth in firm size experienced in Italy over the last decade, disentangling its extensive margin (the rise in the number of MNEs) from the intensive one (the growth in the size of MNEs).

3.1 The weight of MNEs in terms of employment and value added.

To assess the relevance of MNEs in the economy, and a possible North-South divide, we resort to Frame-SBS data for the period 2017-2021.

Results show that MNEs contribute disproportionally to employment and value added. While MNEs represent less than 3 percent of establishments, they employ around one fifth of workers and generate more than 35 percent of value added.

The penetration of multinational enterprises (MNEs) into the Italian economy has been increasing across both Centre-North and South. In 2017, multinational establishments - both foreign and domestic - accounted for slightly below 2 percent of the total in Italy. By 2021, this figure had risen to 2.8 percent, with approximately 40 percent attributed to foreign enterprises (fig. 2). Correspondingly, MNEs have been slowly but progressively taking up a larger share of both employees and value added, reaching 20 percent and 37.2 percent, respectively, in 2021 (figs. 3 and 4).

There is a large North-South divide in the economic relevance of MNEs. In the South, MNEs have from 1 to 1.5 percent of establishments, employ one tenth of workers and generate around one fourth of value added. Across all three dimensions, the penetration of MNEs remains consistently greater in the Center-North of Italy compared to the South. In 2021, the Center-North had slightly more than double the share of establishments and employees and approximately 60 percent more in value-added share.

We further analyze the regional divide in Figure A1 in the Appendix. The incidence of MNEs is rather uniformly lower in Southern regions relative to Northern Italy, the only exception being Basilicata (where the automotive and quarrying industries generate a large share of regional value added).

Figure 2. Share of establishments of MNEs by year and geographical area

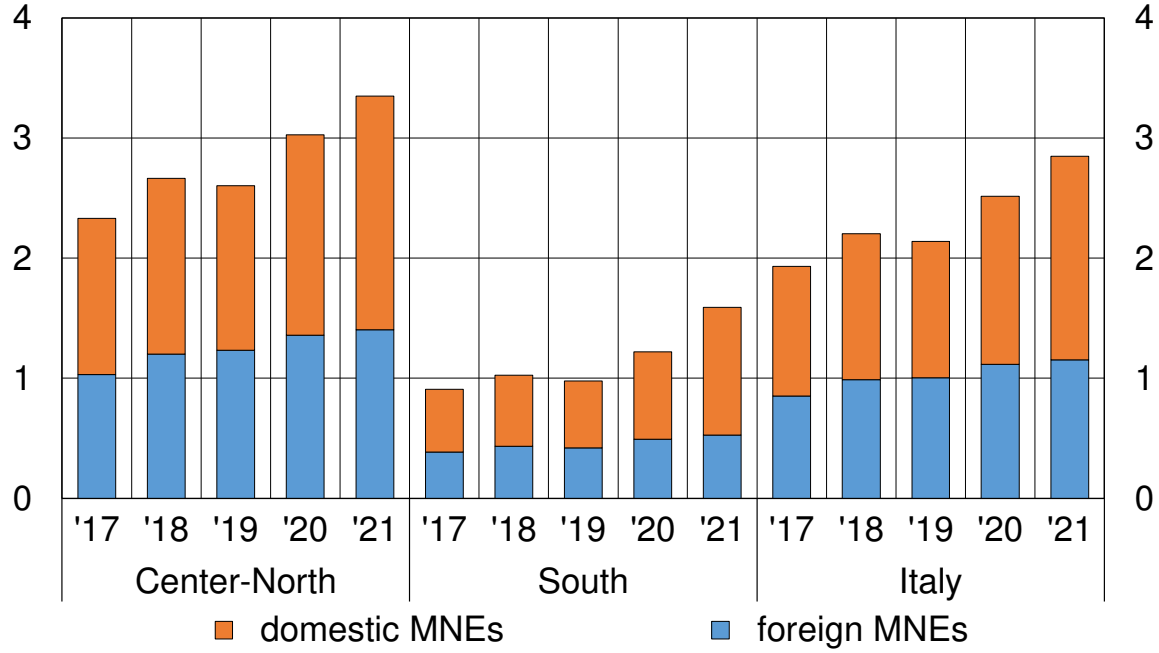


Figure 3. Share of employees of MNEs by year and geographical area

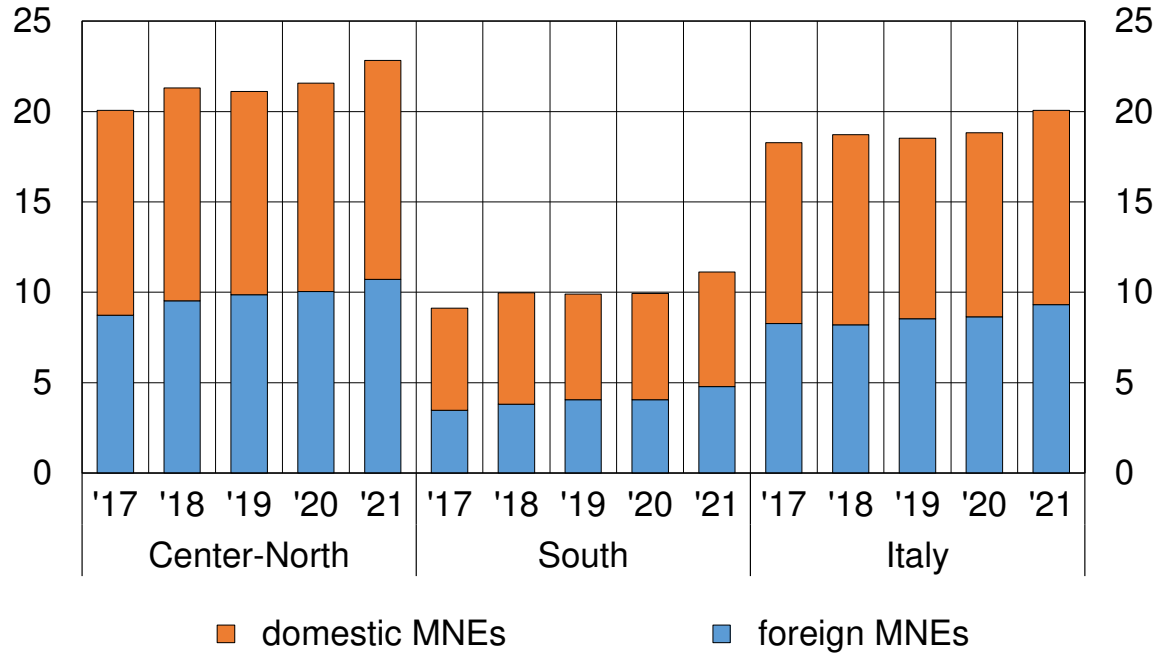
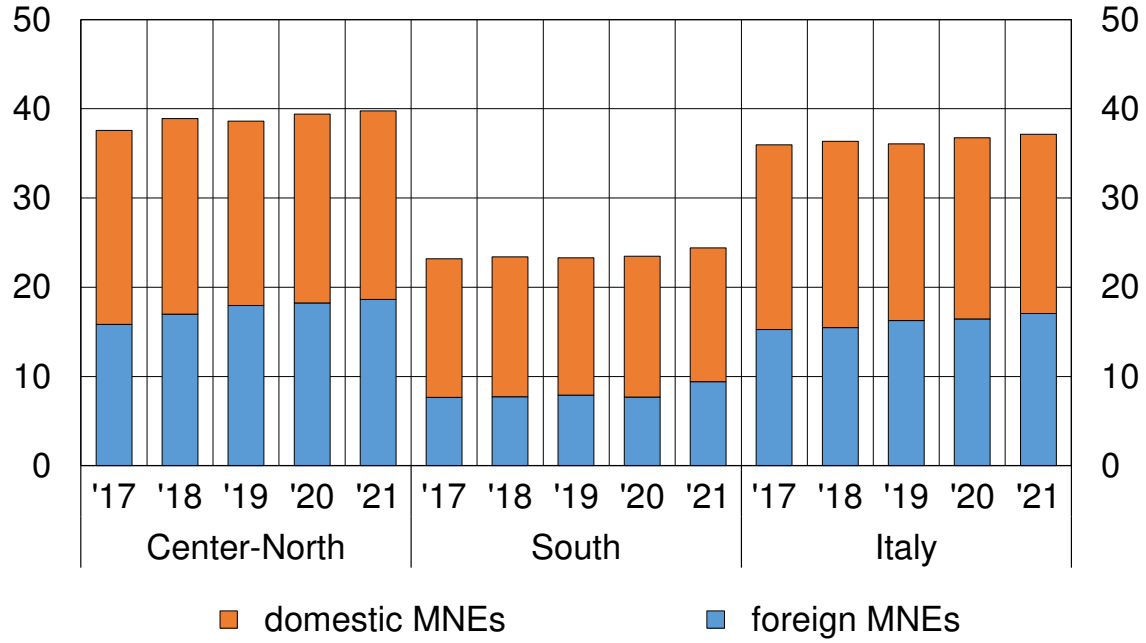


Figure 4. Share of value added of MNEs by year and geographical area



3.2 The contribution of MNEs in explaining the dynamics of firm size

The extraordinary shocks that have hit the Italian business sector over the last two decades (the financial and sovereign debt crises, as well as the more recent COVID pandemic) have triggered a stronger selection process among firms. Greco and Nota (2024) show that this has supported the growth in firm size experienced in the last ten years. According to INPS data on the universe of firms with at least one employee, the average size of Italian firms has increased from 7.4 employees in 2010 to 9 in 2022. Information from IMED allows to identify the role of MNEs in explaining this pattern.

The increase in the number of MNEs and, to a lesser extent, in their size plays an important role in explaining the increase in firm size experienced over the last decade. Figure 5 decomposes the yearly change in firm size into the contributions of MNEs (distinguishing between foreign and domestic ones) and other firms. During the period, MNEs account for a large part of the growth in firm size of Italian firms (about 46% of total increase).

We can further decompose the growth of MNEs and non-MNEs in the contribution on the intensive margin (the growth in size of each group keeping its number of firms fixed at the beginning of period), on the extensive margin (the growth in the number of firms of each group keeping its size fixed), and the interaction between these two components. Results provided in Figure 6 show that before 2016 most of the contribution came from the extensive margin of both domestic and foreign MNEs (64 percent of average growth in size of Italian firms), while the contribution on the intensive margin involved both foreign MNEs and non-MNE firms. From 2016 onwards, the intensive margin of both domestic and foreign MNEs represent over 15 percent of the total growth in size, while the extensive margin contributed by 31 percent to the average growth of Italian firms.

Figure 5. Contributions of foreign MNEs, domestic MNEs and other firms to the growth in size of Italian firms

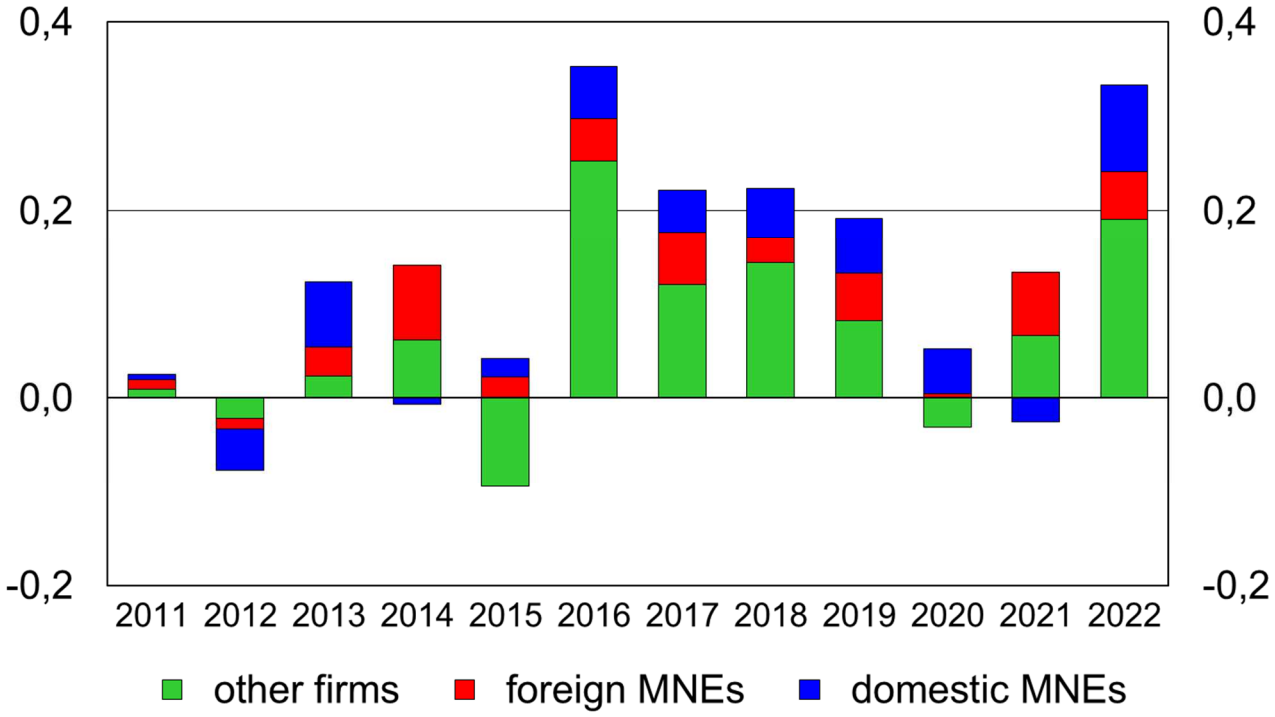
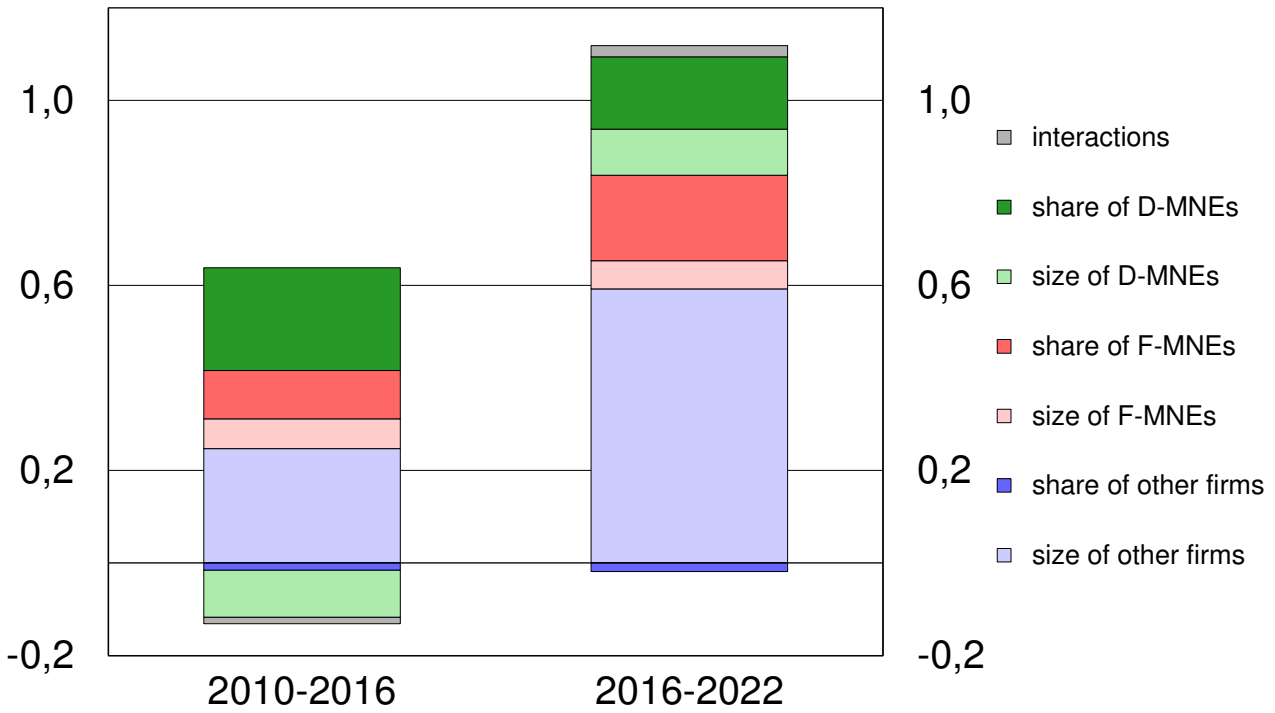


Figure 6. Decomposition of the contributions of foreign MNEs, domestic MNEs and other firms to the growth in size of Italian firms



4. The characteristics of MNEs

In this section we characterize MNEs exploiting firm-level data. The section provides three main facts. First, it gives account for the wide sectoral heterogeneity in the relevance of MNEs. Second, it quantifies the size gap between MNEs and non-MNE firms, and it shows that MNEs have higher revenues, value added, and capital accumulation. These differences remain large also once we take into consideration the different size of MNEs. Third, conditional on firm characteristics, we study the productivity premium of MNEs using different measures of productivity. Finally, we provide evidence of the wage premium, and how it varies according to sectors and by type of occupation. Once the differences in sector, region, and size of MNEs are taken into account, the wage premium stands at around 14 percent, roughly half of the corresponding premium in labor productivity.

4.1 Sectoral distribution

We exploit IMED data on the private non-agricultural and non-financial business economy to analyse sectoral heterogeneity in the weight of Italian MNEs in the corporate business sector. Over the period 2010-22, MNEs represented an overwhelming share of value added in mining and quarrying, an industry characterized by high fixed costs of entry and the global reach of its markets (Figure 7). MNEs generated over half of value added in IT services, manufacturing, construction, business services, and transportation. The relevance of foreign players also differs by sector, being the highest in IT services and the lowest in utilities. The distribution of employment follows a broadly similar pattern (Figure A2), although in sectors characterized by relatively larger economies of scale and higher capital intensity (such as mining and quarrying, manufacturing, and energy) the share of workers employed in MNEs is smaller than the share of value added.

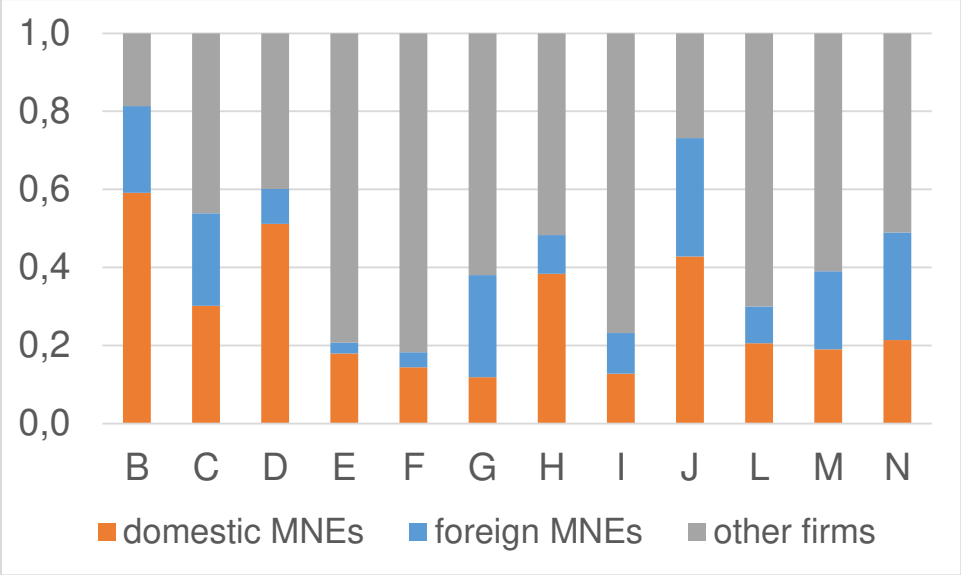
Figure A3 in the Appendix shows the share of value added in each branch of the manufacturing sector. There is considerable variability also within the manufacturing sector. Domestic MNEs are more prevalent in the manufacturing of coke and refined petroleum products (*CD*) sector, while the share of foreign MNEs is larger in the manufacturing of transportations and in pharmaceutical products (respectively, *CL* and *CF*).

Figure A4 in the Appendix shows the distribution of the share of value added of MNEs and other firms in manufacturing and services, distinguishing between high-tech and low-tech sectors.[10] MNEs, notably foreign ones, have a larger incidence in high-tech industries.

[10] We exploit the taxonomy developed by F. Calvino, C. Criscuolo, L. Marcolin and M. Squicciarini, *A taxonomy of digital intensive sectors*, OECD Science, Technology and Industry Working Papers, 14, 2018. It classifies NACE sectors in four quartiles of digital intensity, defined according to the following variables: share of material and immaterial investments in the ICT sector; share of intermediates in the ICT sector; robots per employed person; share of ICT employees; share of online sales. We define "high-tech" firms belonging to sectors in the top two quartiles of the digital intensity distribution.

While comparable data across countries are scant, Eurostat has recently developed experimental data collection on multinationals in EU+EFTA countries. We use this data to compare the sectoral distribution of Italian MNEs. Figure A5 in the Appendix shows the distribution of employment by NACE rev.2.2 letters: in both Italy and EU+EFTA around 40 percent of MNE workersare employed in manufacturing. The share of workers in administrative and support services is substantially larger in Italy, while the one in wholesale and retail trade is smaller.

Figure 7. Share of value added of MNEs and other firms by NACE Rev. 2.2 letters – 2010-22



4.2 Firm-level characteristics

In this section we perform a preliminary analysis to assess to what extent multinational firms have different firm characteristics compared to non-multinational firms (multinationals include both domestic and foreign, non-multinational includes firms that belong to non-multinational groups and unaffiliated firms). To quantify the differentials, we run the following OLS regression:

$$y_{it} = \alpha + \mathbb{1}_{it}(multinational) + \delta_k + \delta_r + \delta_t + \varepsilon_i \qquad (1)$$

Where y_{it} refers to the characteristics of firm *i* that we want to analyze, $\mathbb{1}_{it}(multinational)$ is a dummy variable that takes value 1 for multinational firms and 0 otherwise, δ_k , δ_r and δ_t are industry (6 digit), regional, and year fixed effects. Firm characteristics are measured in logs, therefore the coefficient of the multinational dummy has a clear interpretation: it shows the percentage differential between multinational firms and non-multinational firms. Because multinationals and non-multinationals firms differ substantially in terms of size as measured by employment, we control for log employment in all regression (except that in the regression on employment). We focus on firms' employment, revenue, value added, tangible and intangible capital and investment rate measured from financial accounts between 2010 and 2022, the latest available year. Table 2 shows the results of estimating model (1) with different fixed effects structures, to

test the robustness of the correlations identified. Multinationals are consistently found to be on average larger (130%), to have higher sales (50%), generate more value added (33%), operate with more capital, both tangible (14%) and intangible (75%), and to have higher investment rate (5 pp)

Table 2: Firm characteristics differentials between multinational and non-multinational

	Panel (a) : Log Employment				
Multinational	1.475	1.474	1.316	1.402	1.271
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	Panel (b) : Log Revenue				
Multinational	0.811	0.811	0.567	0.732	0.503
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Panel (c) : Log Value added				
Multinational	0.586	0.585	0.381	0.508	0.331
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Panel (d) : Log Tangible asset				
Multinational	0.304	0.307	0.176	0.257	0.138
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
	Panel (e) : Log Intangible asset				
Multinational	0.982	0.981	0.786	0.946	0.755
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
	Panel (f) : Investment rate				
Multinational	5.408	5.117	4.713	6.909	5.606
	(0.306)	(0.306)	(0.315)	(0.308)	(0.317)
Controls					
Sector FEs	no	no	yes	no	yes
Region FEs	no	no	no	yes	yes
Year FEs	no	yes	no	no	yes
Log Employment (1)	yes	yes	yes	yes	yes

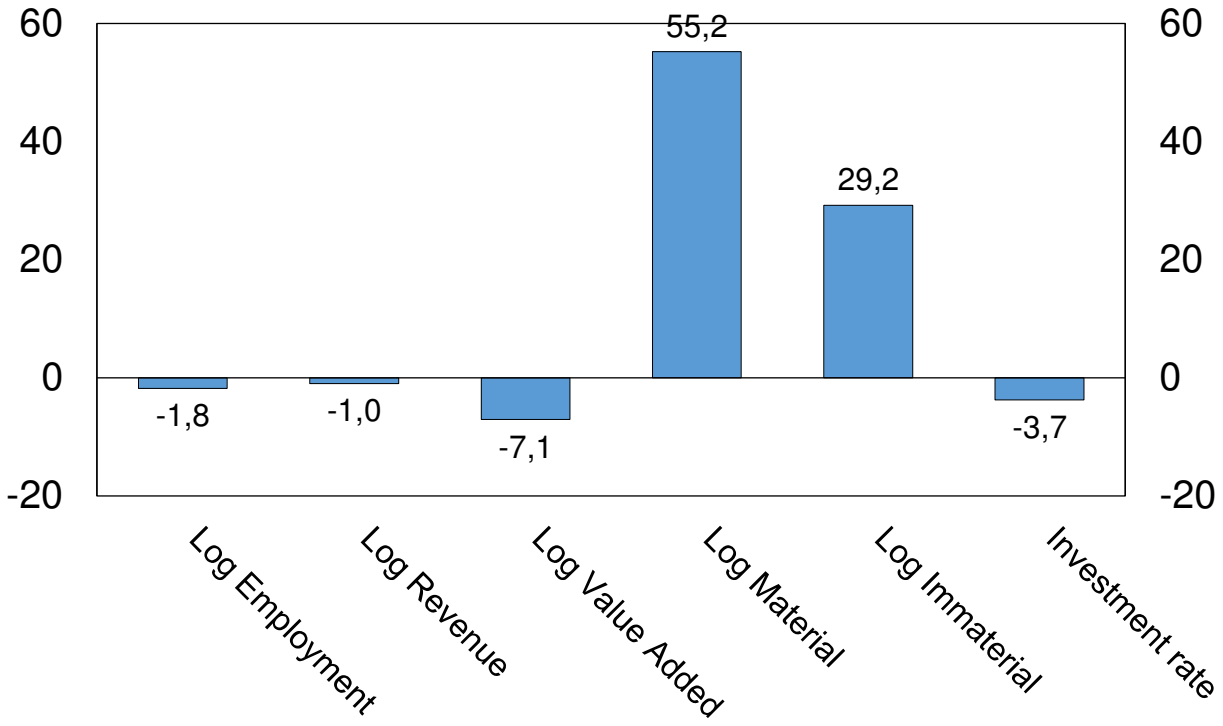
Firm-year regression over the period 2010-2022. The dependent at the top of each panel. Multinational indicates a dummy equal to 1 for multinational firms. Robust standard errors in parenthesis. (1) the variable log employment as a control for firm size is not included in panel (a).

We also investigate if firm characteristics differ between domestic and foreign multinationals. We add to equation (1) an interaction term of the dummy MNE with a dummy equal to 1 for domestic MNE, i.e., those with an Italian GUO. Given that domestic MNEs are more likely to have their headquarters (HQ) located in Italy, we also include a dummy to account for potential differences in their characteristics, such as a greater involvement in control functions compared to operational activities11. Table A1 in the appendix shows the results and Figure 8 below summarizes them. Domestic multinationals are smaller in terms of employment, revenue, value added, and investment rate relative to foreign ones; nonetheless, they are larger in terms of material and immaterial assets. Overall, these patterns are consistent with the smaller firm sizes of Italian corporations, while also reflecting the fact that many strategic assets of MNEs are located in their home countries. Another possibility is that the organization of production differs systematically between domestic

[11] We identify firms' headquarters as those that compile annual consolidated balance sheet.

and foreign MNEs, for example, in terms of production technology or the adoption of managerial practices, something that affects the optimal demand for inputs and the level of output[12]. Although we cannot directly observe technology at the firm level, productivity differentials should reflect these differences.

Figure 8. Firm characteristics differentials between domestic and foreign multinationals



4.3 Productivity premium

In the previous section, we documented that multinational firms have different structural characteristics than non-multinational ones. We now test whether they also have higher productivity, in line with earlier research (Antras et al., 2015; Yeaple, 2013). The productivity premium reflects both the fact that when foreign multinationals acquire domestic units, they target more productive firms, and the fact that multinational firms—domestic and foreign—are more R&D-intensive and innovative, and because they operate in many countries, they have access to greater knowledge and superior technologies.

In the absence of firm-specific output and input prices we cannot identify quantity total factor productivity (TFPQ), and therefore rely on alternative proxies of productivity. In particular, we use two measures of labor productivity, output per worker and value added per worker, and two different measures of revenue TFP: one using headcount employment, another using labor costs as the labor input to control for differences in

[12] For example, in the US domestic MNEs are 8 times larger than foreign ones in term of average employment (Kamal et al., 2022).

the quality of labor force.[13] We estimate the multinational productivity premium using the same empirical framework used in the previous section to quantify the structural differences and data from 2010 to 2022; Table 3 shows the results.

In panel (a), we estimate the unconditional difference, i.e., without controlling for any firm characteristics; in panel (b), we add a set of firm-level controls (firm size and capital intensity); and finally, in panel (c), we add a set of fixed effects to control for sectoral and geographical composition. According to our preferred model (i.e., panel (c)), the productivity premium is always positive and significant, varying between 7 and 43 percent, depending on the measure considered. Importantly, the productivity premium does not change significantly after controlling for sectoral composition and firm-specific characteristics.

Finally, in panel (d), we test whether multinational firms also exhibit higher productivity growth. We do so by adding firm fixed effects to our regressions; because our dependent variable is in log level, the coefficient on the dummy multinational has a direct interpretation in terms of differences in the growth rate in productivity between multinationals and non-multinationals. Results show that, on average, multinational firms have higher productivity growth. The point estimates range between 1.3 and 5.9 percent, depending on the measure of productivity. Taken together, the results confirm also for the Italian economy the existing evidence that multinational firms are more productive and have higher productivity growth than non-multinational.

[13] In the presence of heterogeneous quality of the labor force, and assuming better workers are poached by MNEs, the use of headcount employment as a proxy of the labor input may induce an upward bias in the estimate of the productivity premium of MNEs. Conversely, if there exist some degree of rent sharing among workers in MNEs, the use of the labor cost may bias our estimate downwardly. We, thus, consider the two proxies to yield an upper and lower bound to the underlying productivity premium (see Fox and Smeets 2011 for an analysis of TFP estimation in the presence of heterogeneous labor quality).

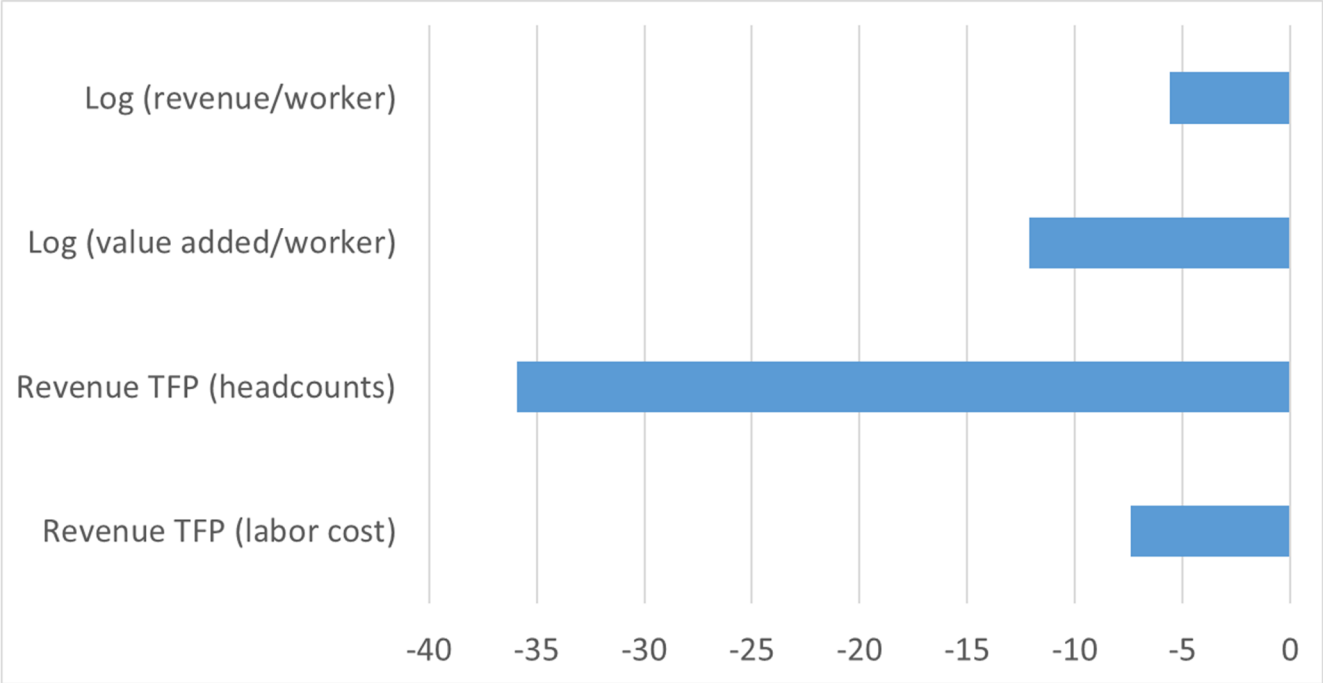
Table 3: Productivity premium differentials between multinational and non multinational

	(1)	(2)	(3)	(4)
	Log (revenue/worker)	Log (value added/worker)	Revenue TFP (labor costs)	Revenue TFP (headcounts)
	Panel (a): unconditional productivity premium			
Multinational	0.543	0.525	0.079	0.601
	(0.002)	(0.001)	(0.005)	(0.012)
	Panel (b): controls for firm size and capital intensity			
Multinational	0.103	0.474	0.111	0.493
	(0.001)	(0.001)	(0.005)	(0.013)
	Panel (c): panel (b) + year, sector and region fixed effects			
Multinational	0.066	0.268	0.122	0.434
	(0.001)	(0.001)	(0.004)	(0.011)
	Panel (d): panel (c) + firm fixed effects			
Multinational	0.013	0.028	0.021	0.059
	(0.001)	(0.002)	(0.006)	(0.017)

Firm-year regression over the period 2010-2022. The dependent variable is defined at the top of each panel. Multinational indicates a dummy equal to 1 for multinational firms. Robust standard error in parenthesis. We consider several proxies of productivity: log output per worker, log value added per worker, revenue TFP using labor costs as labor inputs, revenue TFP using employment headcounts as labor inputs and value added TFP. All TFP measures are estimated using "*prodest*" command and Wooldridge (2009) methodology. In panel (a) we do not add any control to the regression; in panel (b) we add log capital per worker and log employment to all regressions, in the first column we also add log material per worker; in panel (c) we add year, sector and region fixed effects; in panel (d) we add firm fixed effects.

We also assess whether productivity differ between domestic and foreign multinationals. As shown in figure 9 (see also Table A2 in the Appendix), we find that domestic multinationals are less productive that foreign ones. According to our preferred estimates, i.e., revenue TFP that use labor costs as inputs, domestic multinationals are 7.5 percent less productive that foreign ones. The results are also consistent with what we documented for firm characteristics in the previous section. Domestic MNEs employ less labor but create much less value added (-1 and -7.8 percent, respectively); along the same line they own more capital, both material and immaterial, but generate less output. There are several possible explanations for these gaps: one possibility is that foreign multinationals have access to frontier technology (Keller, 2010); another is that when foreign MNEs enter a new market via acquisition, they target best firms (Criscuolo and Martin 2009). Understanding the determinant of these gaps goes beyond the scope of this paper, but it is something that we left for future research.

Figure 9. Productivity differentials between domestic and foreign MNEs



4.4 Wage premium

The productivity premium described in the previous section also translates into a sizeable wage premium. To analyze the wage distribution, we exploit the matched employer-employee data from INPS.[14] Figure 10 shows boxplots of the wage distributions for MNEs and other firms for the period 2021-22 (the last two years available). The median MNE worker earns slightly more than 100 euros per day, roughly similar to the 75th percentile of non-MNE workers. The right panel of the Figure distinguishes between Center-North and Southern Italy: while wages are generally less skewed in the South, the median wage of MNE workers is broadly similar across the two geographic areas. As a result, the premium in median wages seems larger in the South than in the North.

A further distinction relates to workers' occupation. The premium looks particularly relevant for white-collar workers: 75 per cent of them in multinational firms earns more than the median worker in a non-MNE firm (Figure 11). For blue-collar and directors, the wage distribution of MNE workers is particularly more right-skewed than its non-MNE counterpart. Finally, the wage distribution among middle-managers ("*quadri*") is relatively similar across MNE and non-MNE workers.

The wage premium shows considerable variability across industries (Figure 12). It is larger in the mining and quarrying industry (where non-MNE firms account for less than 10 percent of value added) and is very small

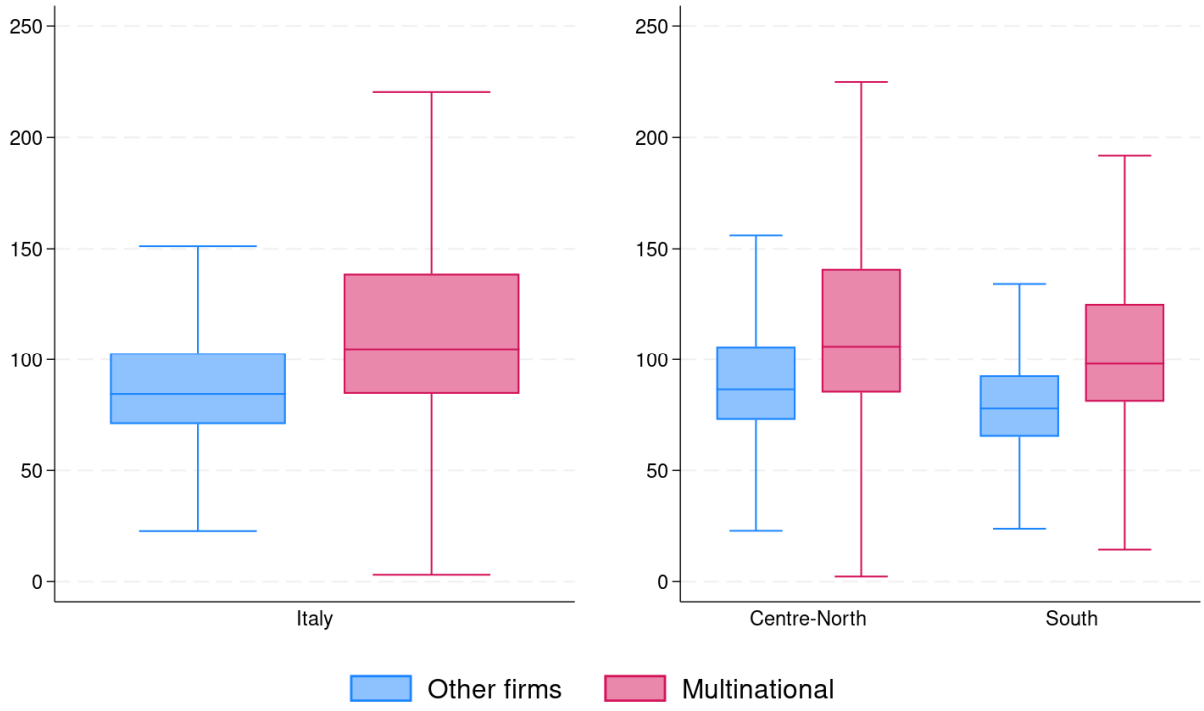
[14] The original sample of individuals born in 24 dates has been further selected by focusing on workers who have worked at least half of the year, employed as blue-collar, white-collar, middle-manager or director (excluding other types of occupation), and trimming values above 10 times the 99th percentile or below 1/10 of the 1st percentile.

in the accommodation and food service sector (where MNEs account for around 20 percent of value added). This large sectoral variability in the wage premium partly reflect differences in the sectoral productivity premia. Figure 13 plots the premium in median wage (i.e., the (log) difference between the median wage of MNEs and the one of non-MNEs) against the premium in median labor productivity at the 4-digit NACE rev.2.2 level. The correlation is positive and statistically significant, and it is also confirmed once we control for firm size.

To better quantify the average wage premium, controlling for these sources of variability, we resort to regression analysis. Table 4 shows that workers employed by multinational enterprises earn 30 percent more on average relative to workers in domestic firms. Yet, a large part of this gap is accounted for by characteristics of firms and workers, shrinking to 8.4 percent when controlling for the sector and size of the firm and for the sex, age, working-time arrangement, contract type and qualification of the worker.

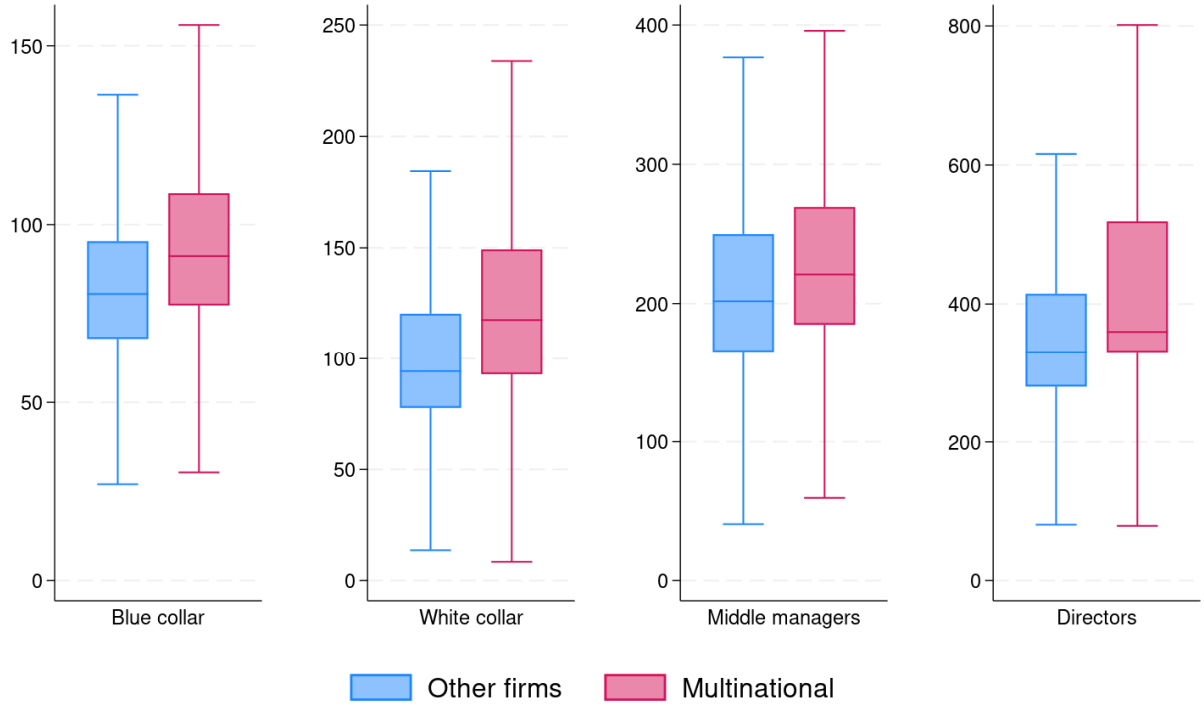
Finally, we test whether the wage premium is higher for domestic or foreign MNEs. In table A2 in the Appendix we show that wage premia, similarly to productivity premia, are higher in foreign firms.

Figure 10. Distribution of wages of MNE and non-MNE workers, by geographic area – 2021-22



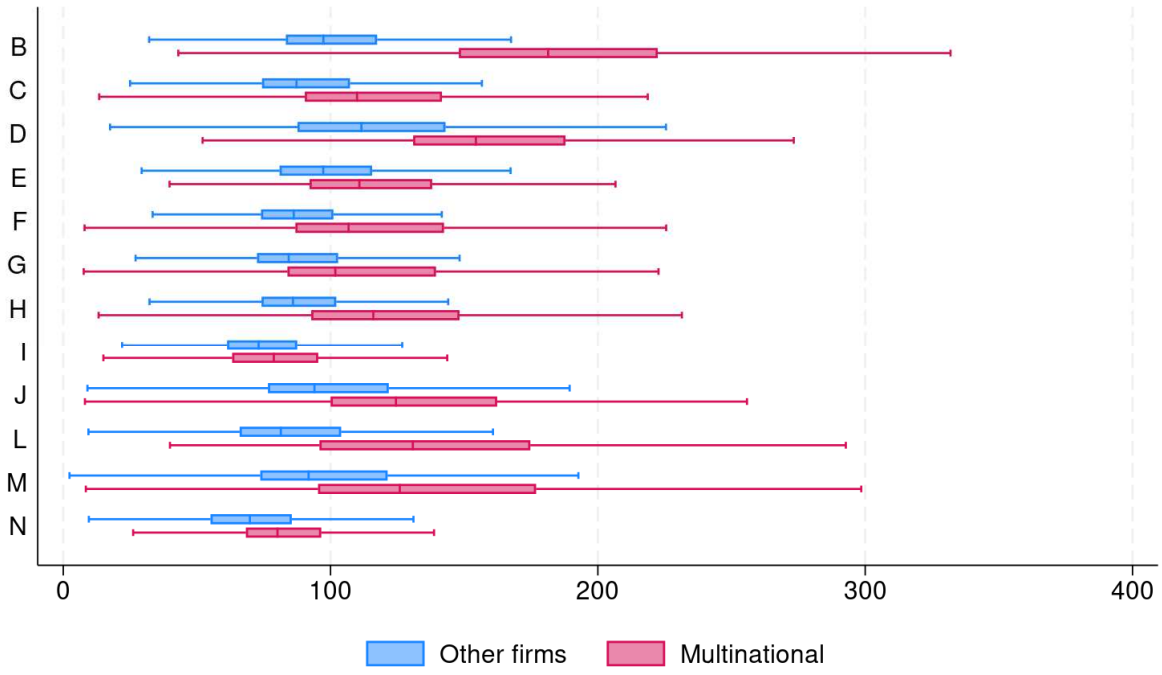
Notes: the figures provide the distribution of wages by type of firm and geographic area. The adjacent lines indicate the top and bottom adjacent values (defined as the values of the value of the observation located above/below 1.5 times the interquartile value from the nearest quartile); the whiskers of the box indicate the 75th and 25th percentile of the distribution; the line inside the box indicates the median.

Figure 11. Distribution of wages of MNE and non-MNE workers, by occupation – 2021-22



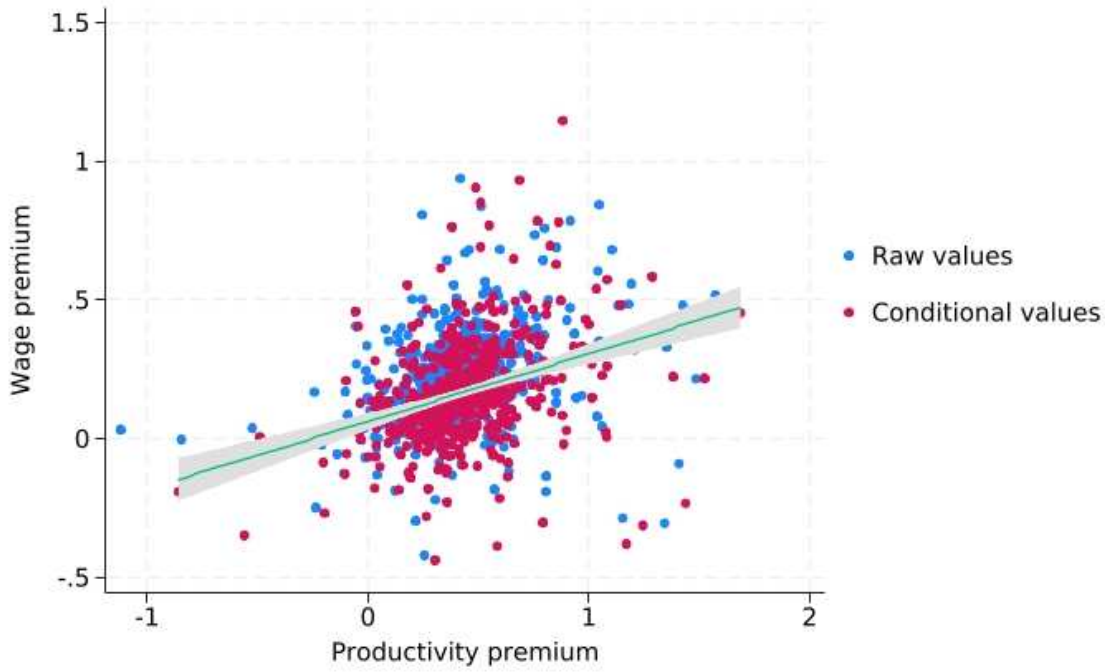
Notes: The adjacent lines indicate the top and bottom adjacent values (defined as the values of the value of the observation located above/below 1.5 times the interquartile value from the nearest quartile); the whiskers of the box indicate the 75th and 25th percentile of the distribution; the line inside the box indicates the median.

Figure 12. Distribution of wages of MNE and non-MNE workers, by sector – 2021-22



Notes: The adjacent lines indicate the top and bottom adjacent values (defined as the values of the value of the observation located above/below 1.5 times the interquartile value from the nearest quartile); the whiskers of the box indicate the 75th and 25th percentile of the distribution; the line inside the box indicates the median.

Figure 13. Sector-level correlation between wage and productivity premia – 2021-22



Notes: the figure plots the correlation between the wage premium of MNEs (the log difference between the median wage of MNEs and the median wage of non-MNE firms) and the productivity premium (the log difference between the median labor productivity of MNEs and the median labor productivity of non-MNE firms) for each NACE rev.2.2 4-digits sector, averaged over the period 2021-22. The correlation is conditional on the size (in terms of log-employment) of the firm.

Table 4: Wage differentials between multinational and non-multinational

Multinational	0.305	0.150	0.292	0.141	0.084
	(0.011)	(0.007)	(0.010)	(0.007)	(0.017)
Controls					
Sector FEs	no	yes	no	yes	yes
Region FEs	no	no	yes	yes	yes
Year Fes	yes	yes	no	yes	yes
Worker Characteristics	no	no	no	no	yes
Log Employment (1)	yes	yes	yes	yes	yes

Firm-year regression over the period 2021-22. The dependent variable is the log-wage of each worker. Multinational indicates a dummy equal to 1 for multinational firms. Standard errors clustered at the firm-level in parenthesis. (1) the variable log employment as a control for firm size is not included in panel (a).

5. The innovative activity of MNEs

In this Section, we exploit the IMED database to study the patenting activity of MNEs in Italy.

We first run a linear probability model of applying to the European Patent Office (EPO) for a patent in 2018 and 2019 (the last two years of data availability) on a dummy "Multinational", equal to 1 the firm is an MNE. Table 5 shows the results with different fixed effect structures. In our preferred specification, with both sector, region, year and size fixed effects, MNEs have a 0.7 percentage points higher probability of applying

for a patent (which corresponds to twice the unconditional probability in the sample). In an additional regression analysis, available upon request, we have interacted the dummy "Multinational" with geographic area dummies: the larger innovation propensity of MNEs stem mostly from Northern Italy, and it is significantly smaller in the South. We have also studied whether the innovation propensity of domestic MNEs is different from the one of foreign MNEs. Results in Table A4 in the Appendix show that, controlling for sector, size, region, and year unobserved heterogeneity (as well as for whether the firm is a headquarter), domestic MNEs have around twice the probability to file a patent than foreign MNEs.

Table 5. Innovation propensity of MNEs vis-à-vis other firms

Multinational	0.018	0.015	0.010	0.017	0.018	0.007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sector FEs	no	yes	no	No	no	yes
Size FEs	no	no	yes	No	no	yes
Region FEs	no	no	no	Yes	no	yes
Year FEs	no	no	no	No	yes	yes

Firm-year regressions over the period 2018-2019. The dependent variable is a dummy equal to 1 if the firm applies for at least one patent. The main regressor is a dummy equal to 1 if the firm is a MNEs. Standard errors clustered at the firm level in parenthesis.

Figure 14 provides the distribution of patents by type of firms and geographic area for the period 2018-19. To allocate patents to each geographical area, we have exploited the region of residence of each inventor and distributed the patent accordingly. Thus, if –for instance- a patent has two inventors, one located in the Center-North of Italy and one in the South, half of the patent is allocated to the former area and half to the latter.

More than 50 percent of patent applications are made by multinationals, and there is a huge divide between the Center-North, where over 90 percent of patents are located, and the South.

Figure 15 shows the top 15 technology fields according to the number of applications received from Italian firms by EPO in 2018-19. There is considerable variability in the share of patents belonging to MNEs, ranging from over 70 percent in Engines, pump, turbines, and transports to less than 40 percent in pharmaceuticals.[15]

In the analysis made above, we have focused on patent applications filed by an Italian firm. However, patents filed by MNEs may be differently linked to the Italian economy. For instance, the headquarter of a foreign MNE may file an application of an invention made by an R&D lab located in Italy. Ultimately, MNE patents can be related to Italy in three ways: first, a patent application may be filed by an Italian firm and the invention may be made by Italian residents; second, an application may be sent by an Italian firm and the inventors may not be resident in Italy; finally, a foreign firm may file an application which features inventors

[15] In this sector, the share of applications filed by MNEs is low because of the presence of private research centers and foundations. These non-MNE entities file a large share of patent applications every year.

resident in Italy. The latter case would correspond to the case of an invention made by an Italian R&D lab of a non-Italian firm. Figure 16 shows the distribution of patent application by type of relationship with Italy for the period 2010-19. While the majority of patents are claimed by Italian firms, applications made by foreign firms with Italian inventors account for roughly one fifth of total applications related to Italy.

Figure 14. Patents of MNEs and other firms in Italy by geographical area – years 2018-19

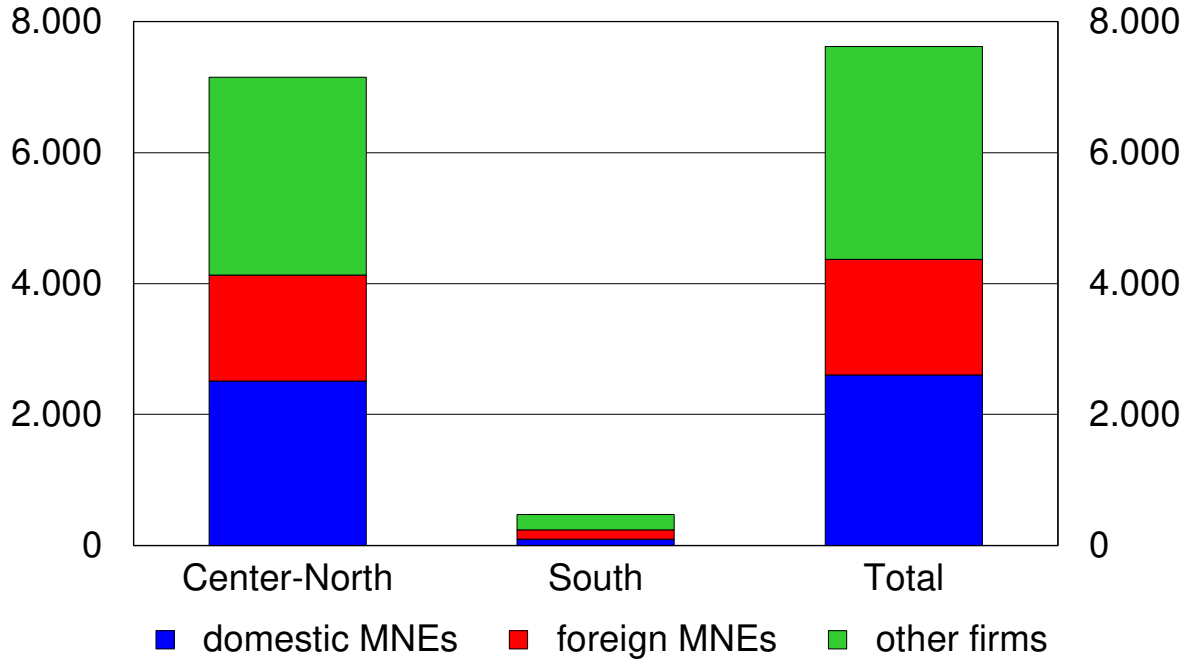
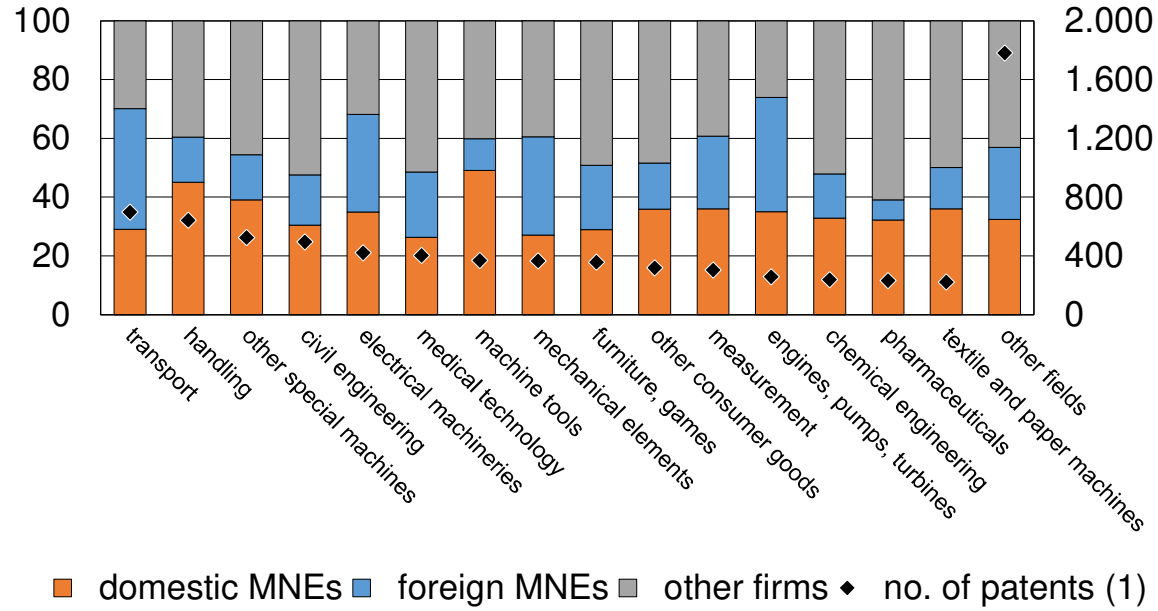
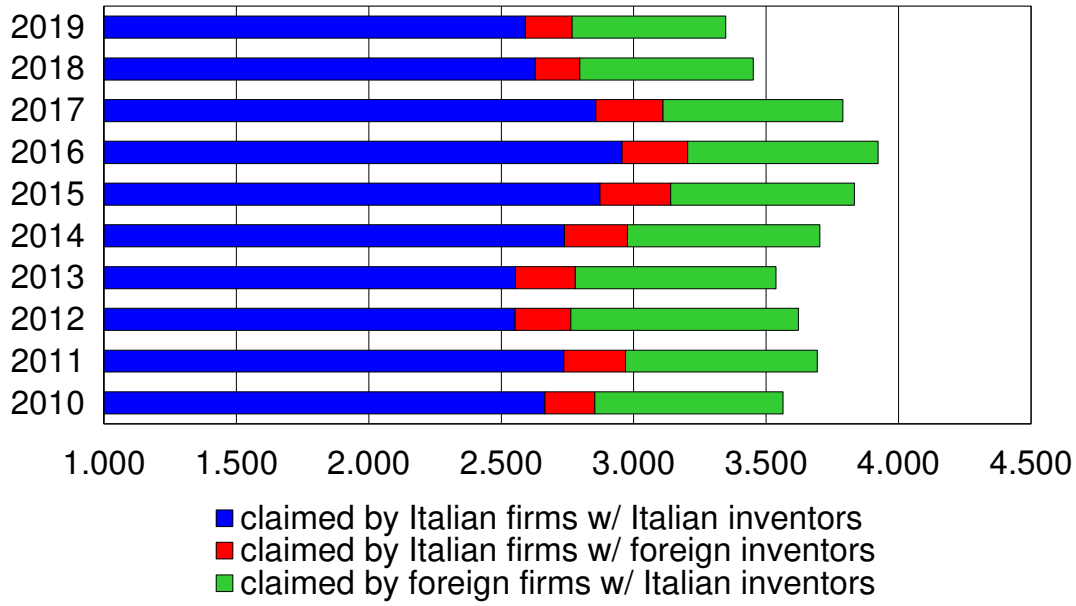


Figure 15. Top-15 technology fields of patents – years 2018-19



Notes: (1) right axis.

Fig 16. Patent applications of MNEs by year and type of relationship with Italy



6. MNEs' Export

As discussed in the introduction, MNEs are key players in the global economy, accounting for around two-thirds of total world trade. This section analyzes and characterizes their role in shaping Italian exports. We start by showing that MNEs are more likely to export, even vis-à-vis comparatively similar firms. Table 6 shows the results of estimating a linear model for the probability that a firm is an exporter on a dummy equal to 1 if the firm belongs to a multinational group and a set of fixed effects (sector, region, year, and size) added one-by-one and then together, to check the robustness of the measured correlation. The analysis focuses on year 2022 (last year of availability of the data). In our preferred specification, which includes all vectors of fixed effects, an MNE has a 14 percent higher probability of being an exporter relative to a non-MNE firm. This corresponds to nearly 50 percent of the unconditional probability of being an exporter in the Italian economy. In Table A5 in the Appendix, we study whether foreign and domestic MNEs differ in their propensity to export. Controlling for sector, size, region, and year unobserved heterogeneity (as well as for whether the firm is a headquarter), we found that domestic MNEs have a slightly lower probability to export than foreign MNEs.

Table 6. Export propensity of MNEs vis-à-vis other firms

Multinational	0.484	0.263	0.295	0.424	0.478	0.138
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Sector FEs	no	yes	no	no	no	yes
Size FEs	no	no	yes	no	no	yes
Region FEs	no	no	no	yes	no	yes
Year FEs	no	no	no	no	yes	yes

Firm-year regressions over the period 2010-2022. The dependent variable is a dummy equal to 1 if the firm is exporting. The main regressor is a dummy equal to 1 if the firm is a MNEs. Standard errors clustered at the firm level in parenthesis.

We then look at the evolution of Italian export by MNEs and other firms over the period 2010-22 (the earliest and latest years in which Custom Agency data are available). Figure 17 shows that, over the period, Italian exports (in current values) increased by 86 percent. This growth was mostly supported by foreign MNEs, whose exports rose by 133 percent over the period, followed by non-MNEs and domestic MNEs (who grew by, respectively, 75 and 70 percent). As a result, the share of export sales from MNEs has risen by 2 percentage points to over 60 percent in 2022.

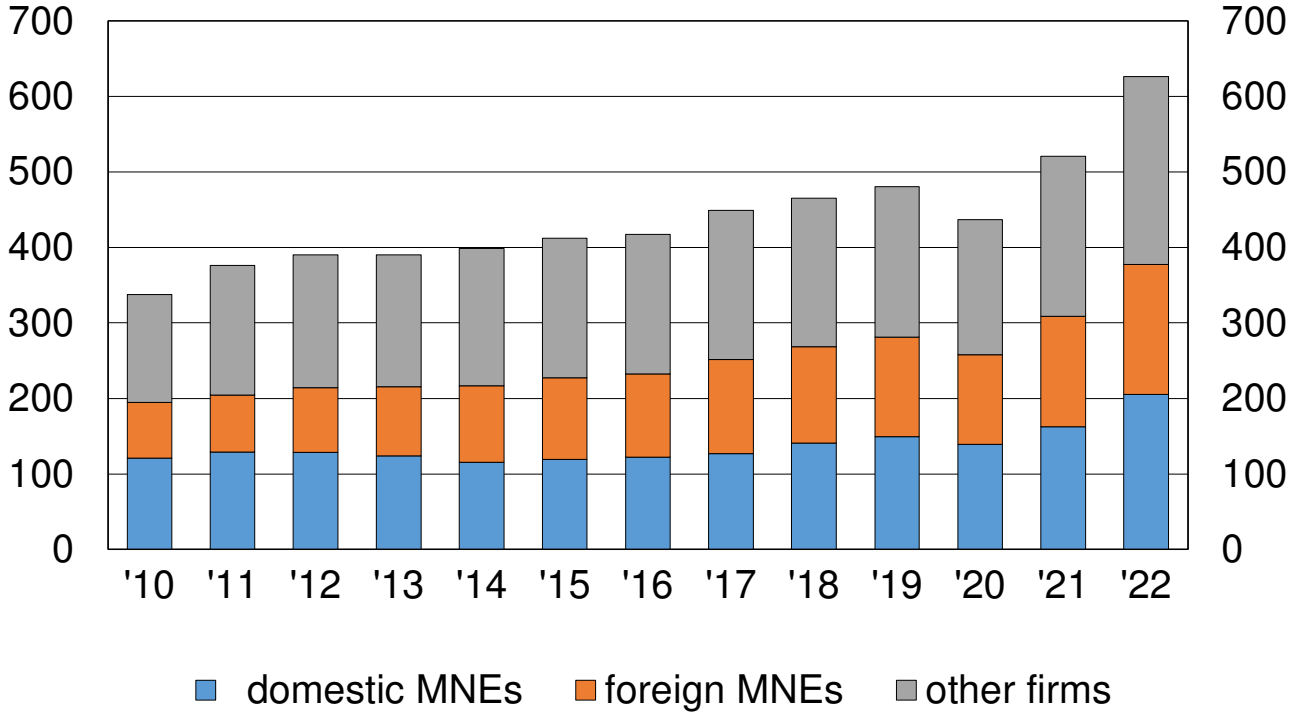
Figures A6 and A7 in the Appendix show the dynamics of exports originated from the Center-North and South of Italy. MNEs represent a smaller share of exports in the South than in the Center-North (46 versus 57 percent on average over the period of analysis). Moreover, domestic MNEs are found to be particularly more relevant in the Center-North, where they generate almost one-third of exports, than in the South, where they sell less than one-fifth of total exports.

Italian custom data also allow us to identify the trade counterparty for each transaction (Crispino and Conteduca 2024) . Combining this information with Orbis Historical data we estimate the share of intra-group exports for MNEs over the period 2017-2021.[16] Table 7 reports these shares for the top 20 destination countries, which account for nearly 73 percent of MNEs exports. Overall, intra-group exchanges represent about one-third of the total. The share, however, is systematically higher for foreign-owned MNEs (on average 48 percent as opposed to 20 percent for domestic ones). Additionally, the relevance of intra-group flows shows some degrees of heteregeneity across destinations, ranging from more than 50 percent in Switzerland to less than 12 percent in Russia.

Finally, our data may allow to analyze the role of MNEs in the importing activity of the Italian business sector. According to preliminary analyses performed on Custom Agency data, MNEs account for about 60 percent of total imports over the period 2010-2021 (Table A8 in the Appendix), with foreign MNEs accounting for about 60 percent of this share.

[16] Transactions are defined as intra-group if the exporter and the buyer share the same GUO. We leveraged information from Orbis Historical to associate a GUO to trade counterparties. Italian custom data report the fiscal identifier of the counterparty for intra-EU transactions, allowing exact matching. Instead, for extra-EU transactions we run a fuzzy matching as only the name of the counterparty is available.

Fig 17. Exports of MNEs and other firms in Italy (billions of current euros)



Notes: the figure shows the evolution of Italian exports. MNEs' exports are compured from the integration of Italian custom data to the IMED database. Exports of other firms are obtained residually from Istat official trade statistics.

Table 7. Exports of MNEs by destination countries

Country	MNEs (Total)		Domestic MNEs		Foreign MNEs	
	Country export share	Share of intra-group trade	Country export share	Share of intra-group trade	Country export share	Share of intra-group trade
Germany	12,28	32,41	11,37	16,36	13,30	50,15
France	9,96	38,11	9,72	23,85	10,23	54,20
United States	9,11	34,30	9,23	25,97	8,97	44,74
United Kingdom	5,35	40,22	5,40	29,42	5,29	51,26
Switzerland	5,08	51,08	3,76	12,89	6,56	74,60
Spain	4,91	36,95	5,18	26,10	4,60	51,73
China	3,20	27,18	3,42	25,00	2,96	30,02
Poland	3,16	32,06	3,06	17,37	3,28	49,73
Belgium	3,05	30,70	1,98	9,36	4,24	51,17
Netherlands	2,34	32,48	2,16	11,91	2,55	52,98
Turkey	2,24	12,69	1,92	9,88	2,61	15,07
Austria	2,00	28,63	2,15	18,10	1,83	43,45
Russian Federation	1,75	11,86	1,98	8,25	1,49	17,7
Japan	1,44	28,06	1,25	25,50	1,65	30,34
Romania	1,38	27,76	1,56	26,65	1,18	29,78
Czech Republic	1,31	17,87	1,39	10,68	1,23	28,43
Korea, Republic of	1,10	27,02	1,03	20,66	1,18	33,23
Brazil	1,09	34,55	0,91	28,49	1,28	39,36
Sweden	1,06	22,61	1,03	11,08	1,10	37,49
Mexico	1,05	21,40	1,01	21,05	1,08	21,84
Total	**72,87**	**33,47**	**69,51**	**20,28**	**76,6**	**48,23**

The table considers the top 20 destination countries in terms of export shares for all MNEs. The period considered is 2017-2021. Shares of intra-group trade are computed considering only transactions with an associated foreign counterparty.

7. Conclusions

In this paper, we provide an overview of the importance of multinationals for the Italian productive system. MNEs account for a sizeable share of employment and value added (although there is a strong North-South divide), and they have contributed to the growth in firm size over the last two decades. They are larger than other firms, both in terms of inputs and outputs, and are generally more productive, displaying a wage premium relative to other firms of similar size, sector, and region. They contribute to trade and innovative activities, both in the north and south of the country.

Our analysis shows that there are several important topics left for future work. First, we show that MNEs contribute disproportionally to the increase in average firm size, and it would be interesting to explore the underlying mechanisms of such a shift, whether it is the results of MNEs becoming more efficient and increasing their scale of operation or a process of growth driven by mergers and acquisitions of domestic firms (Helpman and Niswonger 2022; Garetto et al. 2019). Second, we documented that MNEs pay higher wages. Additional empirical effort is needed to better understand the broader impact of MNEs on the labor market (Alfaro-Urena 2021): their ability to poach workers from domestic firms and the consequences for individual careers; assessing the monopsonistic power of MNEs and the implications for local labor market functioning (Mendez and Van Patten 2022). Third, the role of intra-group trade is another peculiar feature of MNEs internationalization that needs a more in-depth analysis. Intra-group trade may affect firm responsiveness to foreign demand shocks (Altomonte et al. 2012) and may be used by MNEs to shift profits across countries (Vicard 2015). Finally, the availability of detailed information on patents and inventors for both domestic and foreign affiliates of MNEs may allow us to better understand how these firms allocate innovative activities across countries (Bruno et al. 2021) and how to attract them.

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Appendix: additional tables and figures

Figure A1. Share of establishments, employment and value added of MNEs by region – 2021

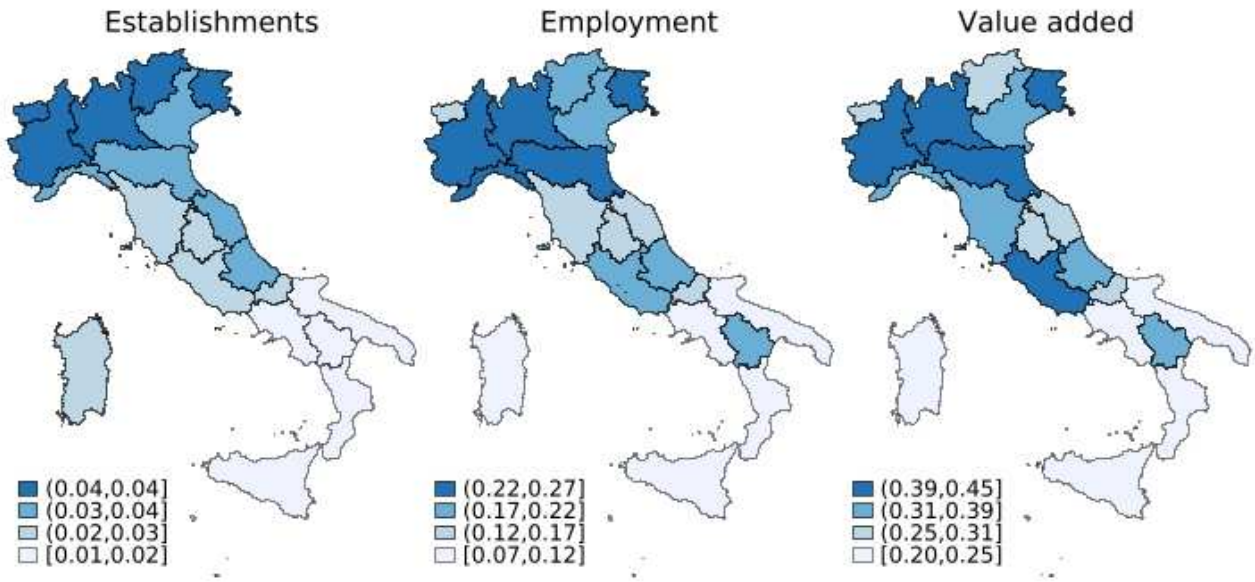


Figure A2. Share of employment of MNEs and other firms by sector – 2010-22

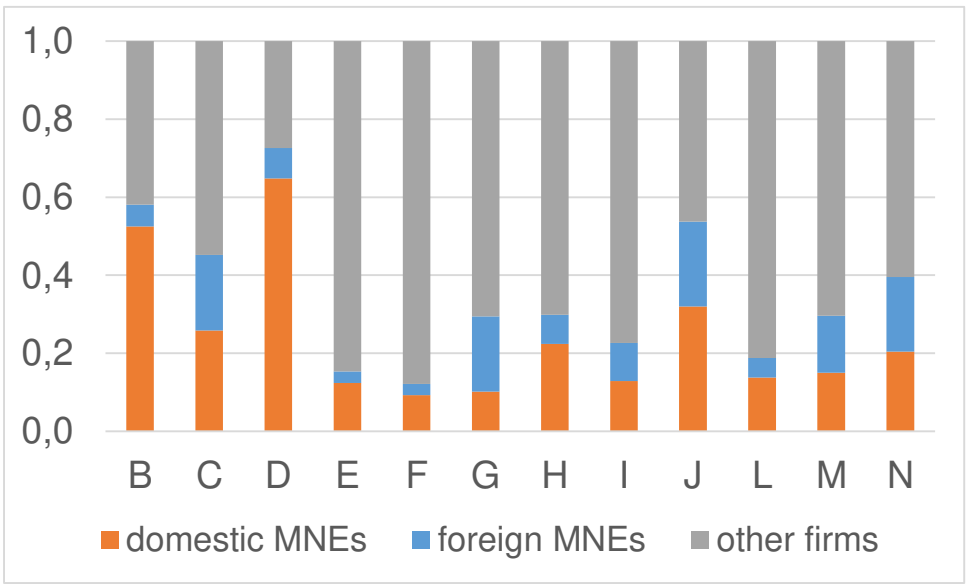


Figure A3. Share of value added of MNEs and other firms in manufacturing – 2010-22

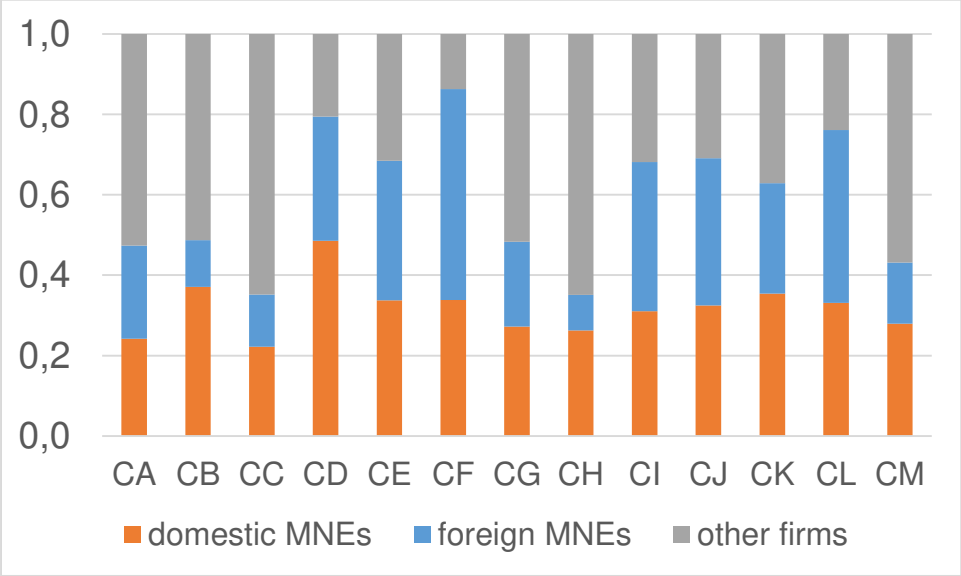


Figure A4. Share of value added of MNEs and other firms in manufacturing and services by high-tech and low-tech sectors – 2010-22

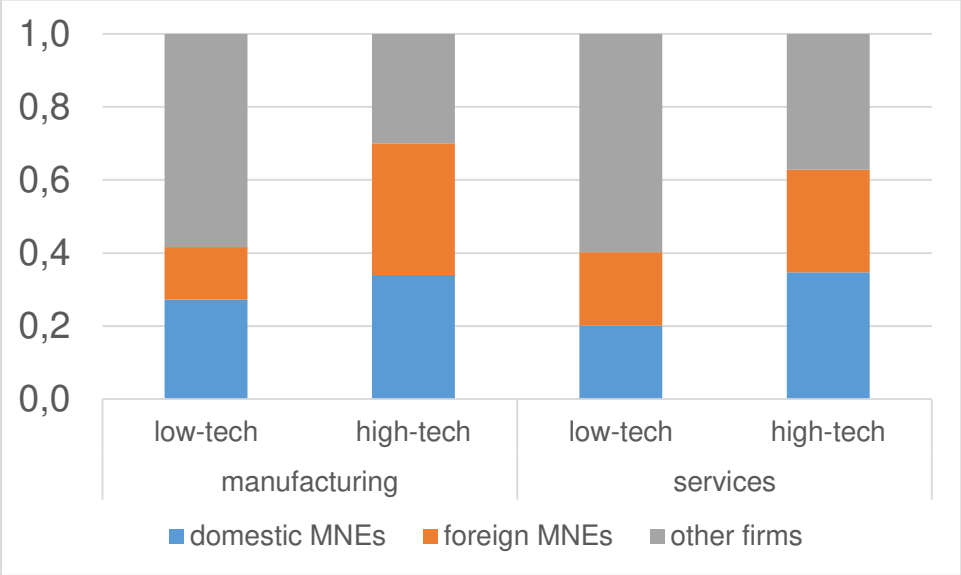
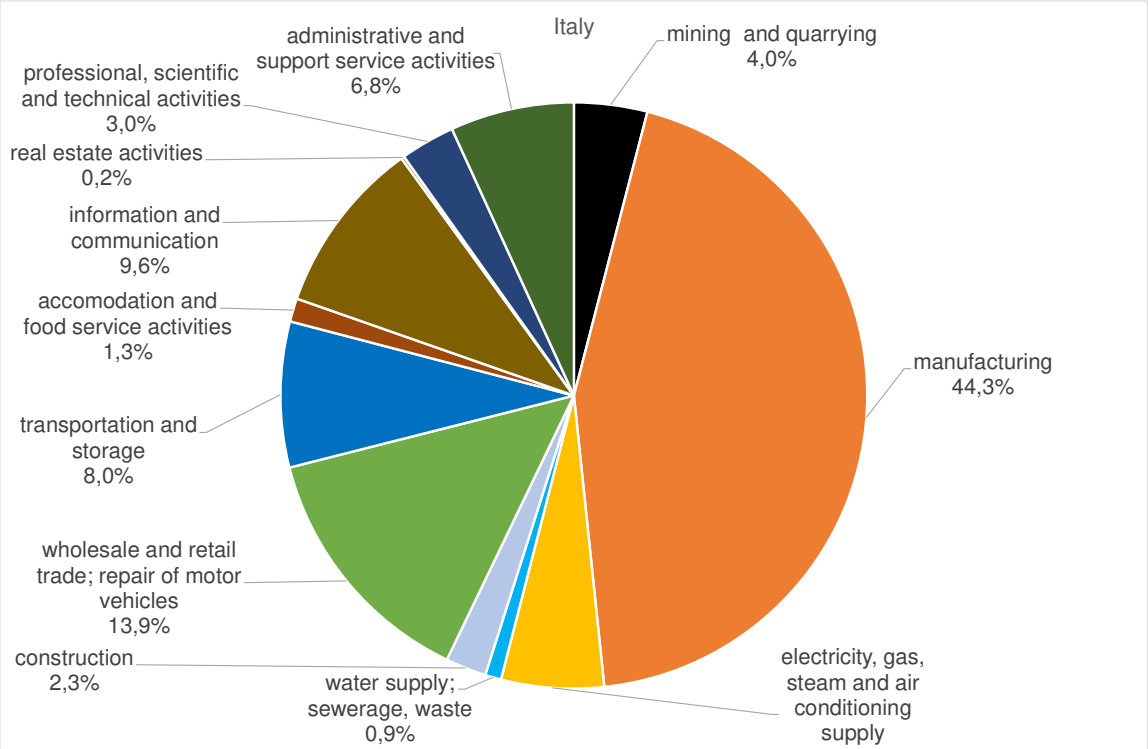


Figure A5. Employment in Italy and EU+EFTA countries by NACE Rev2.2 letters – 2022



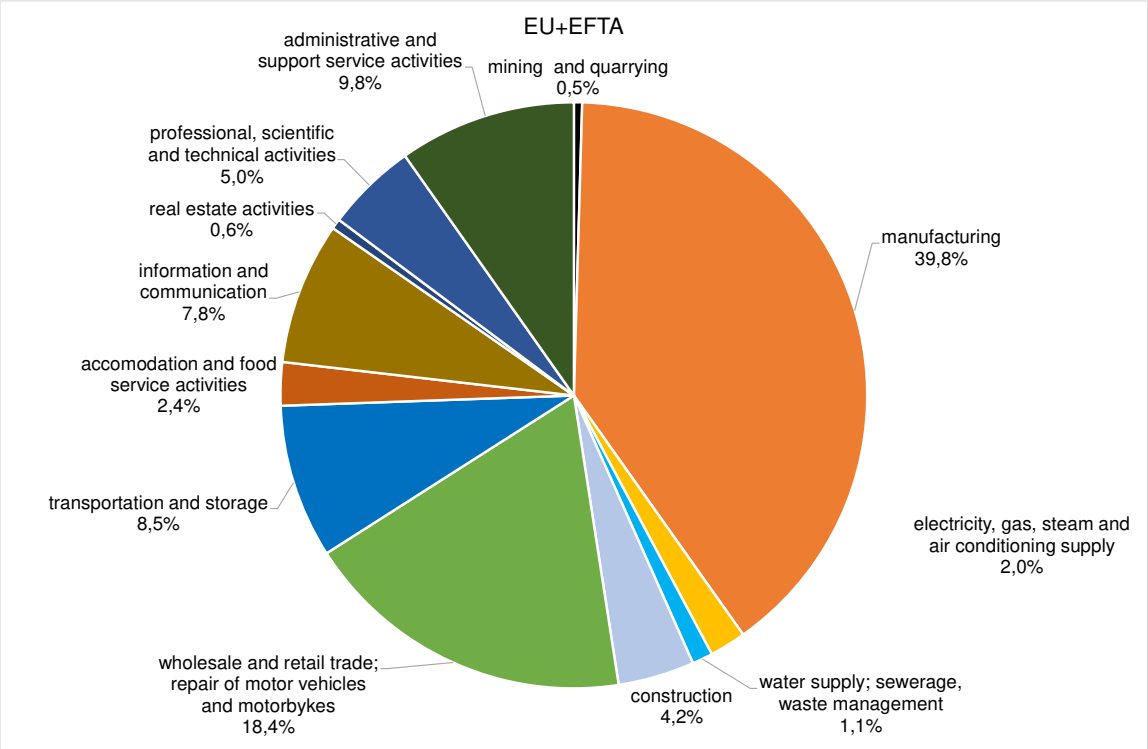


Table A1. Firm characteristics differentials between foreign and domestic multinationals

	Panel (a) : Log Employment			
Multinational	1.271	1.222	1.165	1.175
	(0.003)	(0.004)	(0.003)	(0.004)
Domestic multinational		0.089		-0.018
		(0.006)		(0.005)
Headquarter			2.165	2.168
			(0.009)	(0.009)
	Panel (b) : Log Revenue			
Multinational	0.503	0.490	0.476	0.482
	(0.002)	(0.003)	(0.002)	(0.003)
Domestic multinational		0.025		-0.010
		(0.003)		(0.003)
Headquarter			0.727	0.728
			(0.005)	(0.005)
	Panel (c) : Log Value Added			
Multinational	0.331	0.361	0.318	0.357
	(0.002)	(0.002)	(0.002)	(0.002)
Domestic multinational		-0.054		-0.071
		(0.003)		(0.003)
Headquarter			0.322	0.332
			(0.005)	(0.005)
	Panel (d) : Log Material Asset			
Multinational	0.138	-0.205	0.087	-0.219
	(0.004)	(0.005)	(0.004)	(0.005)
Domestic multinational		0.611		0.552
		(0.007)		(0.007)
Headquarter			1.260	1.181
			(0.009)	(0.009)
	Panel (e) : Log Immaterial Asset			
Multinational	0.755	0.537	0.685	0.518
	(0.005)	(0.007)	(0.005)	(0.007)
Domestic multinational		0.376		0.292
		(0.009)		(0.009)
Headquarter			1.587	1.548
			(0.013)	(0.013)
	Panel (f) : Investment Rate			
Multinational	1.251	3.539	1.440	3.585
	(0.093)	(0.137)	(0.094)	(0.137)
Domestic multinational		-3.955		-3.747
		(0.165)		(0.165)
Headquarter			-4.367	-3.856
			(0.195)	(0.196)

Notes: Firm-year regression over the period 2010-2022. The dependent variable at the top of each panel. The regressor "Multinational" is a dummy equal to 1 if the firm is an MNE; "Domestic multinational" is a dummy equal to 1 if the firm is a domestic MNE; "Headquarter" id a dummy equal to 1 if the firm is classified as the headquarter of the group based on the presence of a consolidated balance sheet. All regressions include year, region and sector fixed effects. Robust standard error in parenthesis.

Table A2. Productivity premium differentials between domestic and foreign multinational

	(1)	(2)	(3)	(4)
	Panel (a): Log (revenue/worker)			
Multinational	0.066	0.096	0.065	0.096
	(0.001)	(0.001)	(0.001)	(0.001)
Domestic multinational		-0.054		-0.056
		(0.001)		(0.001)
Headquarter			0.034	0.041
			(0.002)	(0.002)
	Panel (b): Log (value added/worker)			
Multinational	0.268	0.331	0.262	0.329
	(0.001)	(0.002)	(0.001)	(0.002)
Domestic multinational		-0.112		-0.121
		(0.002)		(0.002)
Headquarter			0.158	0.175
			(0.004)	(0.004)
	Panel (c): Revenue TFP (headcounts)			
Multinational	0.434	0.630	0.427	0.628
	(0.011)	(0.011)	(0.011)	(0.011)
Domestic multinational		-0.348		-0.359
		(0.018)		(0.018)
Headquarter			0.177	0.227
			(0.017)	(0.018)
	Panel (d): Revenue TFP (labor cost)			
Multinational	0.122	0.158	0.115	0.156
	(0.004)	(0.005)	(0.004)	(0.005)
Domestic multinational		-0.064		-0.074
		(0.007)		(0.007)
Headquarter			0.184	0.195
			(0.008)	(0.008)

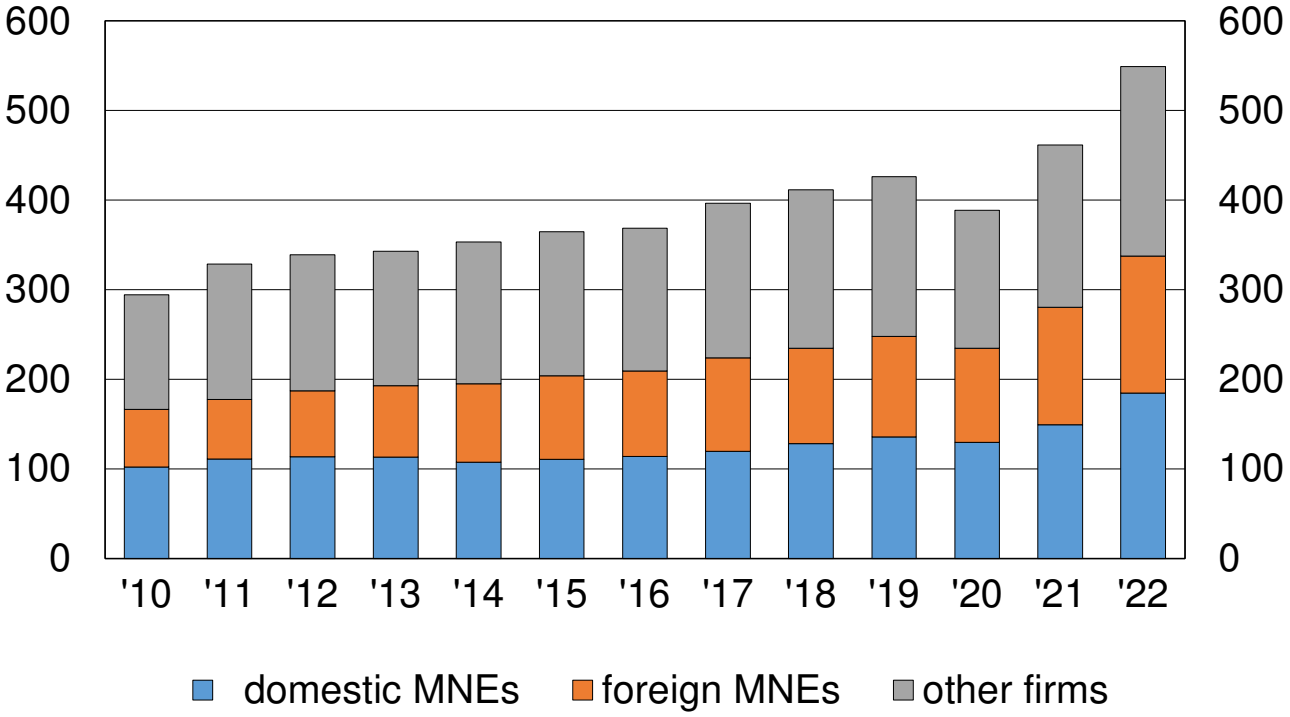
Notes: Firm-year regression over the period 2010-2022. The dependent variable at the top of each panel. We consider several proxies of productivity: log output per worker, log value added per worker, revenue tfp using labor costs as labor inputs, revenue tfp using employment headcounts. All TFP measures are estimated using "prodest" command and Wooldridge (2009) methodology. The regressor "Multinational" is a dummy equal to 1 if the firm is an MNE; "Domestic multinational" is a dummy equal to 1 if the firm is a domestic MNE; "Headquarter" id a dummy equal to 1 if the firm is classified as the headquarter of the group based on the presence of a consolidated balance sheet. All regressions include year, region and sector fixed effects. Robust standard error in parenthesis.

Table A2. Wage premia of domestic and foreign MNEs

Multinational	0.084	0.095	0.074	0.095
	(0.017)	(0.006)	(0.004)	(0.006)
Domestic multinational		-0.036		-0.036
		(0.006)		(0.006)
Headquarter			0.047	0.053
			(0.029)	(0.030)
Sector FEs	yes	yes	yes	yes
Size FEs	yes	yes	yes	yes
Region FEs	yes	yes	yes	yes
Year FEs	yes	yes	yes	yes

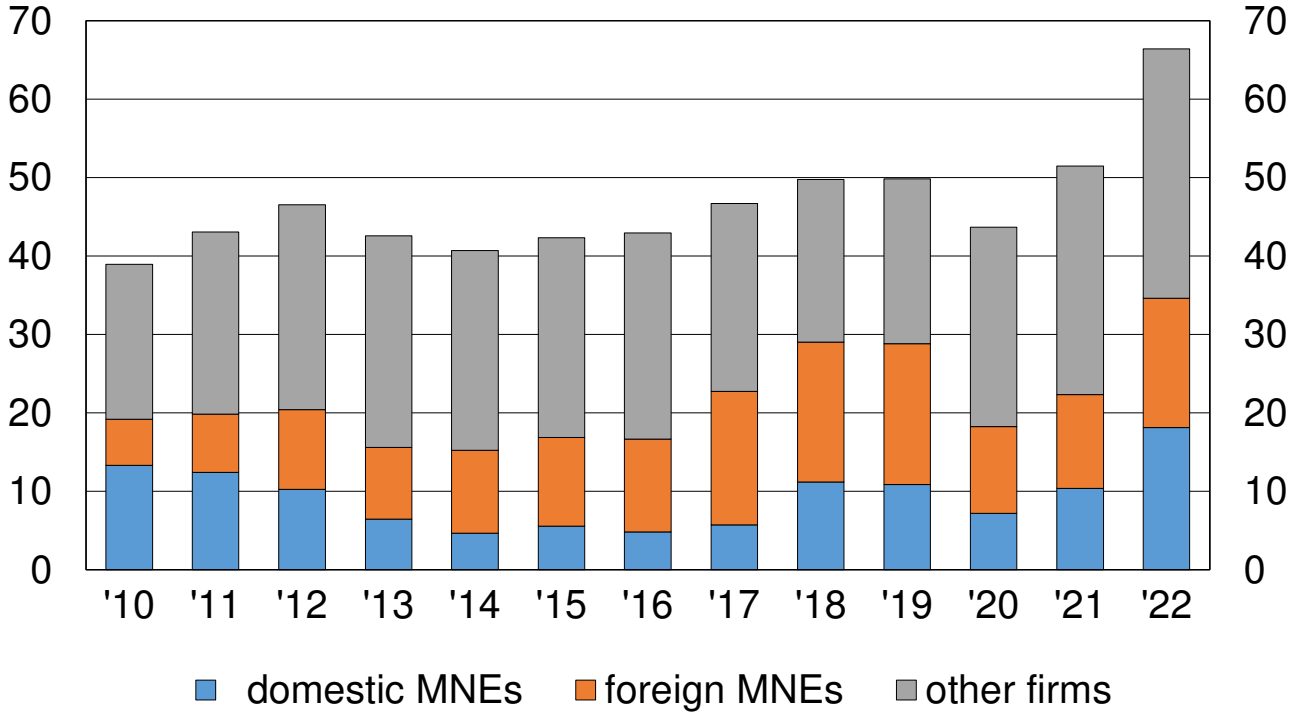
Firm-year regression over the period 2021-22. The dependent variable is the log-wage of each worker. Multinational indicates a dummy equal to 1 for multinational firms. Domestic multinational is a dummy equal to 1 for domestic multinationals. Standard errors clustered at the firm-level in parenthesis. (1) the variable log employment as a control for firm size is not included in panel (a).

Figure A6. Exports of MNEs and other firms in Center-North of Italy (billions of euros)



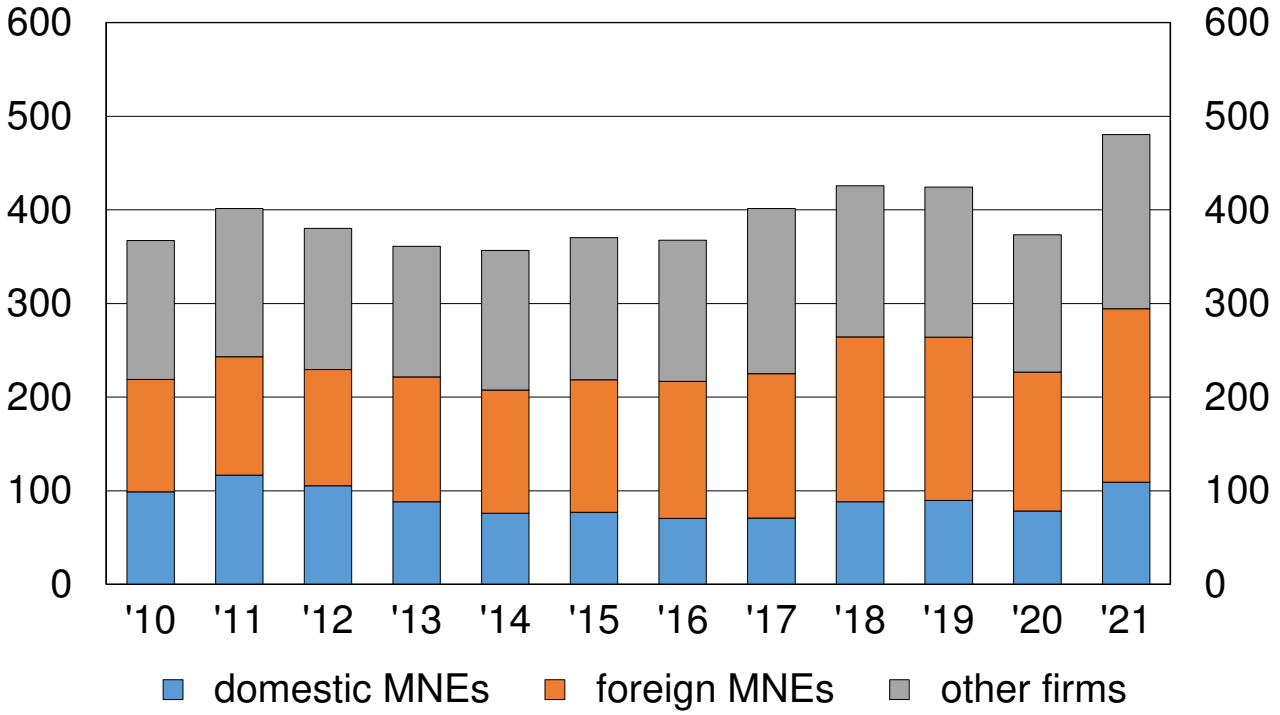
Notes: the figure shows the evolution of exports in Center-North of Italy. MNEs' exports are compured from the integration of Italian custom data to the IMED database. Exports of other firms are obtained residually from Istat official trade statistics.

Figure A7. Exports of MNEs and other firms in South of Italy (billions of euros)



Notes: the figure shows the evolution of exports in South of Italy. MNEs' exports are compured from the integration of Italian custom data to the IMED database. Exports of other firms are obtained residually from Istat official trade statistics.

Figure A8. Imports of MNEs and other firms in Italy (billions of euros)



Notes: the figure shows the evolution of imports in Italy. MNEs' exports are compured from the integration of Italian custom data to the IMED database. Imports of other firms are obtained residually from Istat official trade statistics.

Table A4. Innovation propensity of domestic and foreign MNEs

Multinational	0.007	0.003	0.007	0.003
	(0.000)	(0.001)	(0.000)	(0.001)
Domestic multinational		0.008		0.007
		(0.000)		(0.000)
Headquarter			0.018	0.017
			(0.000)	(0.000)
Sector FEs	yes	yes	yes	yes
Size FEs	yes	yes	yes	yes
Region FEs	yes	yes	yes	yes
Year FEs	yes	yes	yes	yes

Firm-year regressions over the period 2018-2019. The dependent variable is a dummy equal to 1 if the firm applies for at least one patent. The regressor "Multinational" is a dummy equal to 1 if the firm is an MNE; "Domestic multinational" is a dummy equal to 1 if the firm is a domestic MNE; "Headquarter" id a dummy equal to 1 if the firm is classified as the headquarter of the group based on the presence of a consolidated balance sheet. Standard errors clustered at the firm level in parenthesis.

Table A5. Export propensity of domestic and foreign MNEs

Multinational	0.138	0.141	0.135	0.141
	(0.002)	(0.002)	(0.002)	(0.002)
Domestic multinational		-0.006		-0.011
		(0.003)		(0.003)
Headquarter			0.056	0.058
			(0.005)	(0.005)
Sector FEs	yes	yes	yes	yes
Size FEs	yes	yes	yes	yes
Region FEs	yes	yes	yes	yes
Year FEs	yes	yes	yes	yes

Firm-year regressions over the period 2018-2019. The dependent variable is a dummy equal to 1 if the firm applies for at least one patent. The regressor "Multinational" is a dummy equal to 1 if the firm is an MNE; "Domestic multinational" is a dummy equal to 1 if the firm is a domestic MNE; "Headquarter" id a dummy equal to 1 if the firm is classified as the headquarter of the group based on the presence of a consolidated balance sheet. Standard errors clustered at the firm level in parenthesis.