



Talents from abroad. Foreign managers and productivity in the United Kingdom

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ABSTRACT

In this paper, we test the contribution of foreign management to firm productivity. We use a novel data set on the careers of 115,505 managers employed in 10,238 firms in the UK from 2009–2017. We find that domestic manufacturing firms become, on average, 4.9% more productive and about 23.3% more capital intensive after hiring foreign managers. In particular, we find that prior industry-specific experience of foreign managers abroad allows spillover effects to domestic recruiting firms. On the other hand, we find no significant effect on foreign-owned firms after hiring foreign managers, possibly because technological spillovers have already occurred after takeovers by headquarters. The marginal productivity gain is twice as high when the new hires end up on all-British boards without a history of diversity. Our identification strategy combines matching techniques, difference-in-difference and pre-recruitment trends to challenge reverse causality. The results are robust to different specifications and sample composition effects. Ultimately, our results show how restrictions on the global mobility of managerial talent hamper the competitiveness of the domestic industry.

1. Introduction

In recent decades, worker mobility has increased dramatically. There are about 164 million migrant workers around the world (ILO, 2018) and, according to Baldwin (2016, 2019), we should expect to see ever greater global mobility of workers in the coming years following the introduction of new information technologies and further reductions in travel costs. From this perspective, the United Kingdom is a compelling case study of a country where foreign employment has increased from 3.66% to 12.11% in the period 1997–2022 (ONS, 2023). Indeed, the United Kingdom has been a desirable destination in recent decades, and an increase in immigration rates was at the heart of the referendum campaign supporting withdrawal from the European Union. Crucially, workers' international mobility facilitates knowledge transfer across firms (Bahar and Rapoport, 2018; Bahar et al., 2022), increasing product quality (Ariu, 2022) and potentially lowering transaction costs after they bring valuable information about their countries of origin (Gould, 1994; Parsons and Vézina, 2018). The diversity brought by migrant workers can contribute to firms' relational capital and their ability to market products internationally (Parrotta et al., 2014). In the long run, host countries are better off thanks to greater product variety available in consumption and intermediate inputs (di Giovanni et al., 2015). Nationality diversity among managers has also been shown to be positively associated with firm performance (Nielsen and Nielsen, 2013). More in general, Alesina et al. (2016) and Docquier et al. (2020) have shown that birthplace diversity relates positively to measures of economic prosperity.

In this study, we specifically examine how the competitiveness of firms is affected by the mobility of a peculiar category of highly skilled workers, namely managers who make an important contribution to the organization of a firm. In our view, the

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ability of a manager (domestic or foreign) to transfer knowledge from previous positions is reflected in the adoption of better management practices¹ on how other workers organize their productive activities. Nevertheless, scholars have been rather silent about the relationship between foreign management and productivity while focusing on the impact on export performance (Meinen et al., 2018; Mion et al., 2022). From our perspective, the link between organization and productivity is of primary importance: foreign managers may (or may not) influence firms' productive capabilities, which in turn may (or may not) lead to better export performance. Finally, managers abroad may bring tacit knowledge that benefits a firm regardless of its strategy in domestic or foreign markets.

We find that hiring foreign managers has a positive and significant impact (4.9%) on domestic firms' Total Factor Productivity (TFP), which is associated with an expansion of activities as both sales and intermediate inputs also rise (19.6% and 22.9%, respectively). In contrast, we find no statistically significant effect of hiring foreign managers on the productivity of foreign-owned firms, possibly due to the fact that the adoption of best managerial practices has already occurred at the time of the acquisition by foreign headquarters. We find that the productivity gains of domestic firms are mainly due to the industry-specific experience gained by foreign managers in previous positions abroad. We argue that market-specific knowledge allows recruiting firms to increase both efficiency and volume of activity, as we observe *ex-post* increases in revenue, usage of intermediate inputs, and fixed asset investment.

For our analyses, we use a novel dataset that matches the individual careers of 115,505 managers and the financial accounts of 10,238 companies in the United Kingdom from 2009–2017. From our perspective, the United Kingdom is a compelling case study for a country that is revising its migration policies after leaving the European Union. We assess firm competitiveness by estimating Total Factor Productivity (TFP) *à la* (Akerberg et al., 2015), and we make our results robust to alternative methods of Wooldridge (2009) and Levinsohn and Petrin (2003). Our identification strategy includes difference-in-difference estimates that control for pre-recruitment trends after implementing a propensity score matching, where treated firms are paired with nearest untreated neighbours along with various firm-level characteristics (Abadie and Imbens, 2006; Imbens et al., 2004; Rubin, 2001). In our empirical investigation, we build on the experience of previous scholars who have studied productivity gains as a result of foreign acquisitions (Bircan, 2019; Arnold and Javorcik, 2009; Javorcik and Poelhekke, 2017). Among others, our findings are robust to challenges of reverse causality, effects of sample composition, and after most recent diff-in-diff methodologies with multiple treatment timing (Callaway and Sant'Anna, 2021).

Notably, when we delve into sensitivity checks, we find that most productivity gains are gathered by relatively bigger firms with already high capital intensity. Most interestingly, the gains are twice as big when the foreign manager lands on a managerial board where there is no diversity because resident managers had been all British.

The remainder of the paper is organized as follows. Section 2 discusses our framework by embedding it in the previous literature. Section 3 describes the data set and draws attention to preliminary evidence. Section 4 presents the results on the relationship between foreign management, market experience, and firm competitiveness. Section 5 discusses sensitivity and robustness checks. Section 6 concludes.

2. Related literature

The basic idea that good management correlates with efficient use of inputs is old and goes back to Walker (1887). Empirical studies, however, have had to wait for good microdata (Syverson, 2011). In the last decade, a fruitful line of research has shown how different managerial practices can explain part of the productivity gap across firms and countries (Bloom et al., 2019; Bruhn et al., 2018; Bloom et al., 2016, 2012; Bloom and Van Reenen, 2010, 2007; Bertrand and Schoar, 2003). Recently, a study by Giorcelli (2019) showed how specific management training can have a lasting impact on firm performance up to fifteen years after the program ends.

We relate to the above research strand because we examine the role of foreign managers after we assume that establishing good managerial practices is the main channel through which any manager (domestic or foreign) can influence productivity. Our primary intuition is that foreign managers are a special category of highly skilled migrants such as engineers, researchers, and other professionals (Nathan, 2014), whose jobs often require a combination of advanced education and soft skills.

We are mainly interested in how the international mobility of managers affects productivity. Therefore, our work is mainly related to the literature dealing with the spillover effects of worker mobility. Already Görg and Strobl (2005) had shown that worker mobility from a multinational business environment is crucial to explain spillover effects on domestic firms. More recently, Stoyanov and Zubanov (2012) has found that productivity gains are positively associated with hiring workers from more productive firms and that the higher the educational level, tenure, and skills of newly hired workers, the higher these gains are. On the other hand, Ariu (2022) finds that international mobility eventually leads to higher-quality products and more trade thanks to an upgrade in the quality of imported inputs. Overall, we know from previous work that migrant workers increase the TFP of firms in a region or country (Beerli et al., 2018; Mitaritonna et al., 2017). In a general equilibrium model, Fadinger and Mayr (2014) show how increasing the share of skilled migrants can reduce the unemployment rate and brain drain in a country on a scale that depends on the elasticity of substitution between skilled and unskilled labour. Ultimately, the international geography of skills may have aggregate and distributional implications that have significant consequences from a global perspective (Burzynski et al., 2020).

¹ We refer to foundational work showing how advanced managerial practices explain productivity differences across firms and countries (Bloom et al., 2016, 2014; Bloom and Van Reenen, 2010, 2007; Bertrand and Schoar, 2003). For more details, see Section 2.

Our contribution also relates to previous work testing the causality direction of hiring managers to better export performance (Meinen et al., 2018; Mion et al., 2022; Meinen et al., 2022). From our viewpoint, we argue that studying the impact on productivity is of paramount importance. An assessment of firm productivity gains should logically precede any increase in export activity. Indeed, recruited talents can benefit companies regardless of their strategies in foreign markets. For example, a company may benefit (or not) from changes in managerial practices implemented by recruited talent, first improving competitiveness and then making it better in international markets. We believe that our approach is consistent with previous academic efforts to predict firm self-selection by productivity into international status when trade is costly (Melitz, 2003; Helpman et al., 2004; Melitz and Ottaviano, 2008; Conconi et al., 2016). With this in mind, our approach is not inconsistent with the possibility that some workers, including managers, are actually poached to reduce transaction costs and trade with specific destinations (Gould, 1994; Parsons and Vézina, 2018; Mion et al., 2022). In this case, one would still observe an improvement in productivity due to lower trade costs and then an increase in either imports or exports, as (Ottaviano et al., 2018) show in the case of foreign workers in British service firms.²

Interestingly, in our contribution, we find that the recruitment of foreign managers has a significant impact on the productivity of domestic firms, thanks to the experience that the managers have previously gained in the same sector of the recruiting firms. We find that the recruitment of managers paves the way for an increase in the activity of domestic firms (i.e., higher revenues, expenses on intermediate inputs, and investment in fixed assets) and higher capital intensity of domestic firms. Yet, these productivity gains are twice as high when the new foreign recruit sits on a board that was previously made of British managers only, therefore pointing to a correlation between passport variety and firm performance.

Note, however, that we do not find significant productivity increases in foreign-owned firms after hiring foreign managers. Nor do they increase their volume of activity after recruiting events. In this case, we argue that an earlier alignment of managerial practices with the foreign headquarters may have already occurred at the time of the acquisition by a foreign parent company.

In our identification strategy, we draw on the experience of previous scholars in examining the relationship between productivity and foreign acquisitions (Fons-Rosen et al., 2021; Bircan, 2019; Arnold and Javorcik, 2009). As in the case of foreign takeovers, we aim to challenge reverse causality. The best managers (domestic or foreign) are attracted to firms, locations, and industries with higher potential. Following previous literature, we therefore explicitly examine whether firms show pre-recruitment tendencies and whether managers cherry-pick firms and regions. In particular, regional heterogeneous attractiveness is a crucial confounding element once we acknowledge that the most productive firms are located in denser and urban areas (Combes et al., 2012). In contrast to previous findings, we recognize that supply-driven changes in the endowment of immigrant workers can increase local advantages of assortative matching (Orefice and Peri, 2020; Dauth et al., 2018) and thus indirectly affect firm productivity.

Finally, we demonstrate that domestic manufacturing firms with foreign managers on their teams do not differ significantly in productivity from foreign-owned firms with or without foreign managers. We argue that recruiting new managers from abroad is a strategy that can allow domestic firms to catch up with foreign competitors. In this regard, we believe that the international composition of the workforce is another dimension that deserves more attention by scholars interested in firms' global outreach, for example, in Bernard et al. (2018).

Finally, we relate our work to the recent literature examining the impact of the Brexit event (Ortiz Valverde and Latorre, 2020; Cappariello et al., 2020; Dhingra et al., 2017), as our results suggest that any policy that restricts managerial mobility lowers domestic productivity in addition to the losses from new frictions in international markets for inputs and outputs.

3. Data and preliminary evidence

3.1. Managers and firms

Data on the careers of managers and the financial accounts of companies in the United Kingdom come from Orbis, a commercial database compiled by the Bureau Van Dijk,³ which is a consultancy firm controlled by Moody's Analytics. The database collects original information about management based on each company's records, including their roles, recruitment dates, nationality, gender, and age. Unfortunately, there is little information about managers' education and compensation. For our purposes, we select managers who worked for manufacturing companies in the UK for at least one year during 2009–2017, retaining information on their previous workplaces.

Interestingly, the UK has good coverage of management information thanks to specific filing requirements asked by compilers of the UK's national register, the Companies House, following the Companies Act in 2006.⁴

² Similarly, in the context of migration of workers from Balkan countries to Germany in the 1990s, Bahar et al. (2022) find that firms' export performance increases as a result of a more general productivity shift.

³ The Orbis database collects and standardizes financial reports from companies around the world. Orbis data are increasingly used for firm-level studies on multinational enterprises. See for example Alvarez et al. (2017), Cravino and Levchenko (2016), Del Prete and Rungi (2017), Riccaboni et al. (2021), Del Prete and Rungi (2020) and Rungi et al. (2023).

⁴ In particular, the primary legal concern is that a company does not appoint managers who are undischarged bankrupts or who have previously been disqualified by the court from acting as company directors. Recently, risk and compliance firms have systematically examined the ensemble of directors from the Companies House register to determine how many of them are on international watch lists of individuals considered at high risk of crime. See, for example, O'Neill (2008).

Table 1
Top 10 nationalities of foreign managers.

Nationality	No. of managers -per- nationality
United States	4030
Germany	1800
France	1370
Japan	1347
Ireland	975
South Africa	751
Netherlands	712
Italy	646
Sweden	555
Belgium	474
Others	4699

Note: A foreign manager is a manager with a nationality other than that of the UK. In the case of multiple nationalities, including the UK, the individual is considered a domestic manager. Please note that managers who hold multiple passports will be counted above in each country from which they hold a passport.

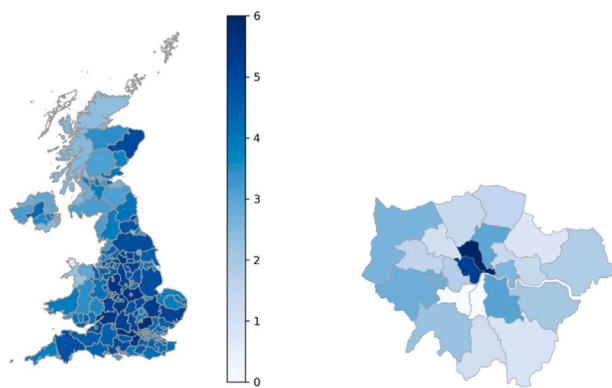


Fig. 1. Geographic coverage: all firms. Note: The total number of sample firms in the UK (on the left) and a focus on London (on the right) are reported in a logarithmic scale.

In this context, we consider a manager to be any person who serves on the board of directors, a committee, or an executive department. Therefore, we exclude consultants and shareholders from our analysis since they are not involved in the firm's day-to-day management. We obtained a sample of 115,505 managers who worked for 10,238 firms in the UK over the period 2009–2017. Note, however, that each manager in our sample may hold more than one role in the same firm or be involved in the management of more than one firm at the same time. We can track a manager's career within and across companies because we have recruitment dates differentiated by role and company for each manager. In [Table A.1](#), we present a snapshot of managers' levels of responsibility as included in our sample. In the following analyses, we consider the hiring date to be the earliest date that a manager held any role in that company. Finally, the nationality of managers is a crucial variable in our analysis. In our sample, we find that 13.3% of managers have a foreign nationality.

[Table 1](#) shows the 10 most common nationalities we discover in our sample. Note that we use a conservative definition of a foreign manager here. For example, a manager with dual citizenship, including that of the United Kingdom, is still considered domestic. In this case, we want to exclude foreign nationals who are also UK citizens because they arrived in the country relatively early or were raised by parents who immigrated to the UK. As largely expected, managers who end up in UK firms come from all over the world. We found 15,353 foreign managers in our sample with 102 different foreign nationalities. Of them, 1690 are nationals with multiple passports different from those of the United Kingdom. The most represented country is the US, followed by Germany, France and Japan. Overall, we find that 50.14% foreign managers are citizens of the European Union, and they account for about 6.67% of the total managers.

In [Figs. 1](#) and [2](#), we report the geographic coverage by NUTS 3-digit regions of our sample firms with at least one manager and firms with at least one foreign manager, respectively. *Prima facie*, we do not observe any specific pattern of geographic selection in our data, as we can identify foreign manager teams across the UK.

In general, we find that the most populous urban regions are also more densely populated by manufacturing activities, with the exception of the London region, where we expect specialization in business services. About 12.5% of companies with foreign managers are located in Greater London, where foreign managers account for about 19%. Notably, we observe how recruiting talents from abroad appears to be a widespread practice among many firms across all UK regions.

For completeness, in [Table A.2](#), we show foreign-owned firms' top 10 origin countries. The identification of foreign-owned firms follows international standards ([OECD, 2005](#); [UNCTAD, 2009, 2016](#)), according to which a subsidiary is controlled after a

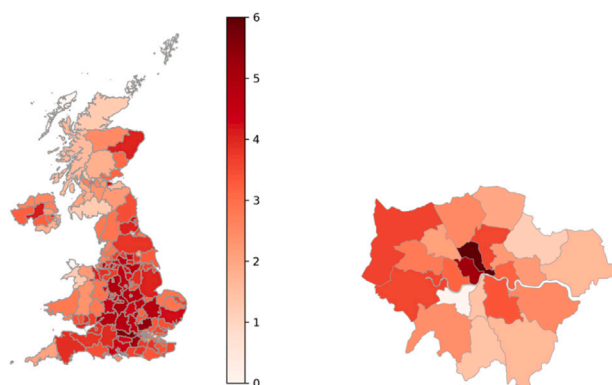


Fig. 2. Geographic coverage: firms with foreign managers. Note: The number of sample firms with at least one foreign manager (left) and a focus in London (right) are shown in a logarithmic scale.

Table 2
Productivity premia, foreign managers, and ownership.

	Mean difference in (log) TFP	N. obs.
Firms with vs. without foreign managers	.175*** (.016)	50,869
Domestic-owned with vs. without foreign managers	.225*** (.029)	29,254
Foreign-owned with vs. without foreign managers	-.039 (.032)	19,687
Foreign- vs. domestic-owned with foreign managers	-.014 (.032)	23,615
Foreign- vs. domestic-owned firms	.181*** (.016)	48,941

Note: The table reports t-tests on the difference in TFPs across different categories of firms. Standard errors are reported in parentheses. *** denotes significance at 1%.

(direct or indirect) concentration of voting rights (>50%). We find that U.S. parent companies control the majority of foreign-owned subsidiaries (1201), while the second largest country of origin is Germany (357), followed by Japan (264) and France (241). If we cumulate the foreign subsidiaries held by parent companies based in EU member states, we find that the latter account for 39.8% (1497) of the total number of foreign subsidiaries (3757).

3.2. Productivity, foreign managers, and ownership

For our baseline analyses, we estimate firm-level total factor productivity (TFP) using the technique by [Akerberg et al. \(2015\)](#). TFP is traditionally interpreted as the portion of output growth not explained by growth in observed inputs. The main identification problem in estimating a firm-level production function is that the choice of inputs may depend on shocks unobserved by the econometrician at the end of the period, when firms' financial accounts typically become available. Therefore, an endogeneity problem may arise such that the observed combination of factors of production occurs simultaneously with the possibly unobserved shocks, making the OLS estimates inconsistent. In this context, [Akerberg et al. \(2015\)](#) improve on previous efforts by [Levinsohn and Petrin \(2003\)](#) and [Wooldridge \(2009\)](#), which we however include as alternative estimators for robustness checks.

To estimate TFP, we use data on operating revenues, cost of goods sold, number of employees, and fixed assets, and we finally control for firm age. All variables are deflated with producer price indices specific to each 2-digit manufacturing industry for turnover, while price indices for capital stock and intermediate inputs are provided at the aggregate level by Eurostat.

For the rest of the analysis, we keep only managers with full information on appointment and resignation dates to track their tenure. At this stage, we present preliminary evidence on the difference in average TFPs between different categories. As largely expected, foreign firms are, on average, more productive than domestic firms (last line, [Table 2](#)). More interestingly, we detect a slightly smaller difference for firms that have foreign managers in their team (first line, [Table 2](#)). The latter is a novelty of our study. The advantage is particularly evident in the case of domestic firms (second line). Even more interestingly, we do not find a significant difference in competitiveness when we compare domestic firms with foreign managers and foreign-owned firms (line 4).

The preliminary findings so far motivate our following analyses, in which we will explicitly challenge the hypothesis that foreign managers can transfer knowledge to a domestic firm in the form of generic or specific skills in production, allowing them to catch up with their competitors. To this end, we want to rule out the phenomenon of cherry-picking, i.e., that more productive firms are also the ones that are more likely to hire better managers and pay them higher wages.

4. Empirical strategy and results

We evaluate the impact of hiring foreign managers on a firm's productivity. We consider firms as treated if they hired a foreign manager in the period 2009–2017. Obviously, we need to control for the endogenous decision of a manager who accepts a position in any workplace, industry, and geographic region that allows changing her career for the better. To this end, we proceed in four steps.

In Section 4.1, we conduct an exercise to determine the average benefit of a firm hiring a foreign manager (Average Treatment Effects on the Treated — ATT), while controlling as much as possible for endogenous firm characteristics and pre-hiring trends. The event studies presented in Figs. 3 and 4 for domestic and foreign firms show the evolution of TFP benefits along the timeline we observe.

In Section 4.2, we then control for the selection of more productive firms into treatment, i.e., the endogenous better ability of recruiters to participate in the international market for talent when compared to non-recruiters. For this purpose, we consider a control group consisting of companies that have never hired foreign managers. The control group is based on a propensity score matching exercise based on covariates that can determine the self-selection of firms into the treatment (productivity, size, wage bill, capital intensity, firm age, skill intensity, number of managers, regional density, and ownership). In this case, we challenge our identification strategy to simulate a counterfactual with firms that are otherwise similar and have all the characteristics that make them an attractive destination for a talented worker, including their observed productivity, except for their recruitment strategy in the observed period.

Then, in Section 4.3, we verify that the previous industry experience of foreign managers abroad is the most important channel through which domestic firms can achieve productivity gains. Finally, in Section 4.4, we provide additional results qualifying the impact of foreign managers when we consider alternative firm-level indicators, including sales, usage of inputs, capital intensity, and investment strategies. Finally, in Section 5, we provide a battery of robustness and sensitivity exercises.

4.1. Foreign managers and recruiting firms

We begin by estimating the following equation, looking only at the group of companies that hired foreign managers during our period of analysis:

$$(\log)TFP_{ijrt} = \beta_0 + \beta_1 T_{ijr} \times Post_t + \beta_2 X_{ijrt} + \gamma_j + \delta_t + \zeta_r + \sum_k \eta_k \times \delta_i + \varepsilon_{ijrt} \quad (1)$$

where the dependent variable TFP_{ijrt} is the Total Factor Productivity of a firm i active in a sector j and a region r at time t . TFP is calculated using the semiparametric methodology of Akerberg et al. (2015). T_{ijr} is the treatment, i.e., it indicates that a firm has hired a foreign manager, while $Post_t$ is a binary variable that equals one for post-hiring observations. In this case, $(1 - e^{\beta_1})$ is our main quantity of interest and captures the average productivity gains of recruiting firms expressed in percentage units. X_{ijrt} includes firm-level controls (size, age, capital intensity, wage bill, the ratio of managers to employees,⁵ foreign ownership) and regional employment density as a proxy of local attractiveness. In addition, we include γ_j , δ_t and ζ_r as 2-digit industries, year, and NUTS -3 regional fixed effects, respectively. Crucially, at this stage, we control for the self-selection of foreign managers into firms and industries with better prospects. As in Bircan (2019), the term $\sum_k \eta_k \times \delta_i$ represents a full set of pre-recruitment characteristics.⁶ (age, size and 2-digit industry) interacted with a time trend δ_i . We repeat the same exercise first for all firms and then separately for domestic and foreign-owned firms.

In columns 1–3, Panel B of Table 3, we find a significant increase in TFP for domestic firms in an interval from 4.39% to 7.36% (log units: from .043 to .071) after hiring foreign managers. Interestingly, the impact is relatively higher when we control for pre-treatment trends in column 3. Apparently, domestic firms fully explain the significance of the coefficients in Panel A when we do not separate firms by ownership status.

When we look at foreign-owned firms in Panel C of Table 3, we never find a statistically significant effect on TFP after hiring foreign managers. To our knowledge, there is no evidence of a similar result in previous literature. We suspect foreign headquarters already had the opportunity to realign managerial practices in subsidiaries after the acquisitions. Previous findings appear to be systematic in the following analyses.

Eventually, the albeit weakly positive and significant results for all firms reported in columns 1–3 of Panel A are entirely driven by foreign managers' impact on domestic firms.

In Figs. 3 and 4, we also visualize the coefficients of the separate event studies conducted for domestic and foreign firms, respectively. We track the trend in (log) TFP over the three years following the hiring of foreign managers, controlling for what happened two years earlier. In a nutshell, the plots represent the coefficients of a modified version of Eq. (1), where the productivity trends are visualized over a six-year interval centred around the point in time when the recruiting firms decided to hire a foreign manager.

Interestingly, the positive productivity gains of domestically owned firms (Fig. 3) occur in the first year after the arrival of the foreign manager and persist for the following three years, while there are no significant benefits for foreign-owned firms (Fig. 4).

4.2. Recruiting and non-recruiting firms

In this Section, we challenge the selection of some firms into treatment, i.e., the endogenous ability of the firms that actually hired foreign managers during our period of analysis to attract the best (domestic or foreign) managers. We conjecture that part

⁵ We consider the ratio of managers to employees as a proxy for the skill intensity at the firm level. Unfortunately, we do not have data on the composition of the workforce with non-managerial positions. We guess that a higher or lower presence of foreign workers positively correlates with the possibility of recruiting foreign managers.

⁶ We categorize firm age into the following classes: [0,4], [5,9], [10,14], and 15 years. We categorize firm size into the following classes: [0,9], [10,19], [20,49], [50,249], and 250 employees.

Table 3
TFP and foreign managers — ATT.

	(1)	(2)	(3)
Dep. variable:	(log) TFP	(log) TFP	(log) TFP
Panel A: All firms			
Hired × Post-recruitment	.023*	.022*	.021*
	(.012)	(.012)	(.011)
R^2	.935	.936	.946
No. of obs.	23,932	23,932	23,932
Panel B: Domestic firms			
Hired × Post-recruitment	.043***	.050***	.071***
	(.011)	(.012)	(.025)
R^2	.925	.928	.943
No. of obs.	4562	4562	4562
Panel C: Foreign firms			
Hired × Post-recruitment	.011	.010	.009
	(.013)	(.014)	(.013)
R^2	.942	.943	.954
No. of obs.	19,370	19,370	19,370
Panels A, B and C:			
Firm controls	Yes	Yes	Yes
Industry effects	Yes	Yes	
Year effects	Yes	Yes	
Region effects	Yes	Yes	Yes
Industry × Year effects		Yes	Yes
2-digit industry & age & size trends			Yes

Note: The table shows the average treatment effect on treated firms (ATT) after controlling for confounding factors. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Controls include firm size, firm age, capital intensity, average wage bill, the share of managers on total employees, regional employment density and, for Panel A, foreign subsidiary status. *, ** and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

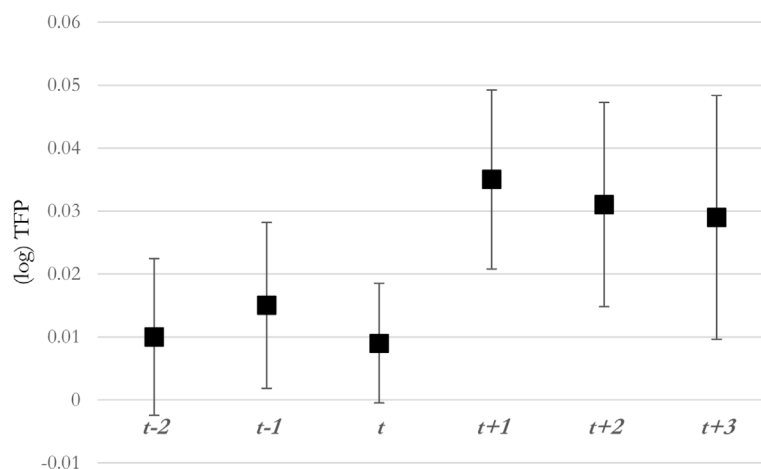


Fig. 3. TFP, foreign managers and domestic firms. Note: An event study of the effect on the productivity of domestic firms hiring foreign managers at time t . The markers indicate the magnitude of the coefficients, and the bars indicate a 95% confidence interval of a modified version of Eq. (1). Errors are clustered at the firm level. We include controls for industry-time fixed effects, region-level fixed effects, firm-level characteristics, and pre-recruitment trends.

of the productivity premia for domestic firms that we observe in Table 3 is explained by an inherently higher potential of firms having the ability to enter international labour markets, offering better salaries and better career prospects for managers. For our purposes, we apply a matching procedure to select a control group consisting of firms that never hired foreign managers during our period of analysis, although they mirror the characteristics of the observed recruiters.

We run a five-nearest neighbour matching algorithm (Abadie and Imbens, 2006; Imbens et al., 2004; Rubin, 2001) that looks for peers within any 2-digit industry-*per*-year cell in which we find treated firms in the UK to ensure that performance differences due to different market conditions do not affect our estimated effects. Finally, the control group consists only of firms that never hired a foreign manager during our period of analysis. All time-varying explanatory variables are lagged by one year to reflect pre-treatment performances. We choose a set of predictors of treatment following the previous literature examining the effects of foreign ownership (Bircan, 2019; Arnold and Javorcik, 2009; Javorcik and Poelhekke, 2017). Namely, we assume that hiring foreign managers is endogenous to a similar set of observable characteristics that make a firm desirable as a target for a foreign

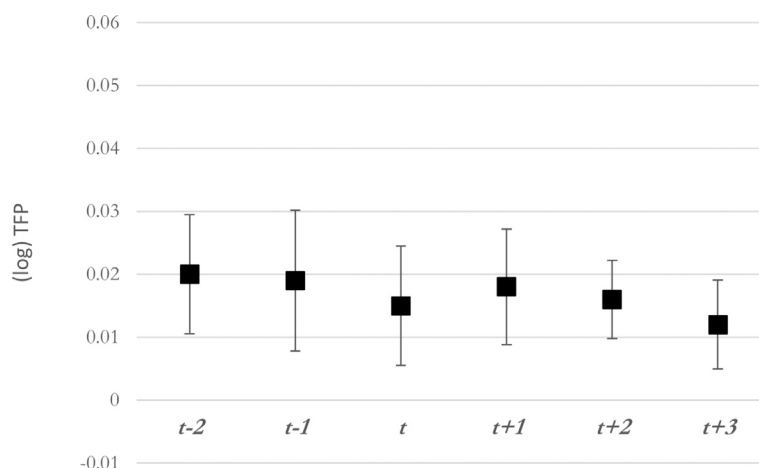


Fig. 4. TFP, foreign managers and foreign firms. Note: An event study of the productivity effects of hiring foreign managers at time t by foreign-owned firms. The markers indicate the magnitude of the coefficients, and the bars indicate a 95% confidence interval of a modified version of Eq. (1). Errors are clustered at the firm level. We include controls for industry-time fixed effects, region-level fixed effects, firm-level characteristics, and pre-recruitment trends.

Table 4

Probit estimates for a propensity score matching.

Dep variable: Recruiting foreign manager(s) = 1	
(log) TFP_{t-1}	.0337** (.0150)
(log) Firm size $_{t-1}$.0328*** (.0080)
(log) Average wage $_{t-1}$.1083*** (.0168)
(log) Capital Intensity $_{t-1}$.0171*** (.005)
(log) Age $_{t-1}$	-.0457*** (.0079)
Skill Intensity $_{t-1}$.0580* (.0313)
(log) Number of Managers $_{t-1}$.195*** (.0152)
Regional Employment Density $_{t-1}$	2.5174*** (.6014)
Foreign ownership $_{t-1}$.6074*** (.0106)
Pseudo R^2	0.364
No. of obs.	47,717
Year and 2-digit industry fe	Yes
Errors clustered by firm	Yes

Note: The table reports coefficients after a probit model. The dependent variable equals one if a firm recruits a foreign manager. Errors are clustered at the firm level in parentheses. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

firm, including technology, firm age, firm size, average employment composition, and capital intensity. In addition, we include three specific controls that may make a new position in a firm desirable to talented newcomers: the share of managers in the total number of employees as an indicator of the skill composition of the workforce, the total number of managers, and the regional employment density of firm locations as a proxy for local agglomeration economies. The latter is particularly useful because we recognize that the local assortative matching between workers and firms indirectly impacts firm-level productivity, as acknowledged by [Orefice and Peri \(2020\)](#) and [Dauth et al. \(2018\)](#).

Table 4 shows the marginal effects of the first-stage probit model. It is noticeable that all main predictors are correlated with selection into treatment as expected. Firms that are more productive, larger, and offer higher wages are more likely to hire foreign managers in our sample. Young firms with a high number of managers and a higher skill intensity attract foreign employees. The firm is also relatively more attractive to foreign talent if it is foreign-owned and located in a populous region. In Table 5, we also evaluate the quality of the matching procedure by performing a balancing test. In doing so, we compare the sample averages of all covariates in the treatment and control groups. Ultimately, we find that there is no *ex-post* statistically significant difference along the variables we include for matching, as the null hypothesis of the same mean is always rejected in the matched sample. In the last column of Table 5, we report the variance ratio, $V_e(T)/V_e(C)$, of the residuals of the covariates of the treated over the control

Table 5
Balancing test on the nearest-neighbour matching procedure.

Variable	Sample	Average treated	Average untreated	% Bias	t-test	p-value	$V_e(T)/V_e(C)$
(log) TFP _{<i>t-1</i>}	Unmatched	2.66	2.45	11.3	13.28	0.001	1.16
	Matched	2.67	2.66	0.50	0.52	0.601	1.05
(log) Size _{<i>t-1</i>}	Unmatched	4.49	3.97	36.7	44.80	0.001	1.40
	Matched	4.64	4.62	1.3	1.48	0.138	1.15
(log) Avg wage _{<i>t-1</i>}	Unmatched	5.98	5.73	52.7	61.97	0.001	1.02
	Matched	5.98	5.95	6.5	7.56	0.001	0.99
(log) Age _{<i>t-1</i>}	Unmatched	8.83	8.75	8.4	12.15	0.001	1.16
	Matched	9.03	9.01	1.6	1.95	0.051	1.05
(log) N. Managers _{<i>t-1</i>}	Unmatched	1.51	1.24	55.5	74.90	0.001	0.90
	Matched	1.57	1.53	9.5	10.82	0.001	0.96
(log) Capital intensity _{<i>t-1</i>}	Unmatched	5.55	4.98	35.8	42.94	0.001	1.25
	Matched	5.56	5.50	3.6	3.78	0.001	1.11
Skill intensity _{<i>t-1</i>}	Unmatched	0.15	0.12	6.8	8.37	0.001	0.80
	Matched	0.10	0.10	1.9	2.71	0.007	0.72
Regional employment density _{<i>t-1</i>}	Unmatched	0.03	0.03	13.0	19.44	0.001	1.23
	Matched	0.03	.03	5.7	5.77	0.001	1.11
Foreign subsidiary	Unmatched	0.78	0.13	172.4	277.76	0.001	1.11
	Matched	0.81	0.81	1.7	1.61	0.107	0.96

Note: The table reports sample averages and t-tests for the original unmatched sample after the application of a nearest-neighbour matching technique. See Rubin (2001), Rosenbaum and Rubin (1983), and Rosenbaum and Rubin (1985) for more details.

Table 6
TFP and foreign managers — ATE.

	(1)	(2)	(3)
Dep. variable:	(log) TFP	(log) TFP	(log) TFP
Panel A: Domestic firms			
Hired × Post-recruitment	.047*** (.012)	.048*** (.013)	.048** (.023)
R^2	.950	.951	.950
No. of obs.	16,696	16,696	16,696
Panel B: Foreign firms			
Hired × Post-recruitment	.008 (.019)	.010 (.019)	.009 (.019)
R^2	.967	.968	.968
No. of obs.	8060	8060	8060
Panels A, and B:			
Firm controls	Yes	Yes	Yes
Industry effects	Yes	Yes	
Year effects	Yes	Yes	
Region effects	Yes	Yes	Yes
Industry × Year effects		Yes	Yes
4-digit Industry & age & size trends			Yes

Note: The table contains estimates for a sample matched after a propensity score. Errors are clustered at the firm level in parentheses. Coefficients are in log units. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, regional employment density and, for Panel A, foreign subsidiary status. *, ** and *** represent $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

group. Following Rubin (2001), a perfect match implies a ratio of one, while a ratio between 0.5 and 2 indicates acceptable quality. In our case, we have many variance ratios that are in a range close to one. Moreover, the standardized biases we report in column 5 of Table 5 are less than 10% in absolute terms for all variables after matching.

After ensuring that pairs of observations are well matched, we proceed with the diff-in-diff estimates proposed in Eq. (1) and report the nested results in Table 6. Interestingly, the TFP premia for domestic firms are slightly lower after implementing the matching procedure when we compare with Table 3. Our baseline results are in column 3, where we report the most challenging specification, with firm controls, region effects, industry-*per-year* fixed effects, and a term that captures past trends that may make a firm or industry a desirable destination for a successful career even before a talent is hired. In this case, a foreign recruit makes a domestic firm about 4.9% more productive on average (log units 0.048, $1 - e^{-0.048} = .049$). As in the previous results in Table 3, we confirm that there are no statistically significant productivity gains for foreign-owned firms.

4.3. The role of industry experience

In general, there are many potential channels through which foreign managers can influence a firm's productivity. They can teach native workers what they would otherwise have difficulty learning on their own (Markusen and Trofimenko, 2009), or they

Table 7
TFP, foreign managers, and market experience — ATE.

	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP
Hired × Post	.021* (.010)	.004 (.023)
Hired × Market × Post	.080*** (.034)	.021 (.023)
R ²	.951	.968
No. of obs.	16,696	8060
Firm controls	Yes	Yes
Region effects	Yes	Yes
Industry × Year effects	Yes	Yes
Industry & age & size trends	Yes	Yes

Note: The table reports estimates on a matched sample when the treatment is split considering companies that recruited foreign managers with and without specific market experience. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

can bring skills that help reduce transaction costs once they bring valuable information about their home countries (Gould, 1994; Parsons and Vézina, 2018). In general, the cultural diversity that workers of different origins bring can contribute to companies' relational capital and their ability to market products internationally (Parrotta et al., 2014).

In the specific case of foreign managers, we argue that all the previous skills or knowledge imply that managers (domestic or foreign) can intervene to change managerial practices. See also the framework we outline from related literature in Section 2. The tacit knowledge that managers bring to the new firm can usefully inform the implementation of better management. Unfortunately, our data do not allow us to track whether managerial practices actually change after hiring. Nor can we say much about the intangible skills of newly hired managers from our data. What we can do, however, is understand what the newly hired managers did at earlier stages of their careers because we have information on the companies where the managers worked before they took the new positions in the UK.

In this context, we consider prior experience as a proxy of the skills that managers bring to their new jobs. In particular, we explicitly challenge the hypothesis that market-specific experience acquired abroad can explain the productivity gains of domestic firms observed in the previous sections. To this end, we repeat the baseline exercise of Eq. (1), this time separating firms that recruit:

- foreign managers who have previously worked in a firm whose main industry (NACE 2-digits) is the same as that of the latest hiring firm in the UK;
- foreign managers who have worked in a company whose core industry (NACE 2-digits) differs from that of the latest recruiting company in the UK.

As with the last set of results, we rely on a control group consisting of firms that have never hired a foreign manager, determined according to the propensity score matching described and validated in Section 4.2. Results for domestic and foreign firms are reported separately in Table 7.

Interestingly, we find that the TFP gains of domestic firms are mainly explained by market-specific experience acquired abroad, and the corresponding coefficient is relatively higher than previous estimates (8.3%; log units: .080), although on average, managers without market-specific experience also have a positive, albeit weakly significant, impact (2.1%; log units: .021). In column 2 of Table 7, we still find no significant impact on the productivity of foreign-owned firms.

In the case of domestic firms, we argue, we are able to capture the type of managerial knowledge that is passed on to the firm. Prior market experience entails on-field training that may be particularly attractive to recruiters. We believe that our results are related to previous work examining the effects of recruiting events on export performance (Mion and Opromolla, 2014; Mion et al., 2022). There, too, a market-specific experience is most beneficial for firms recruiting managers to gain better access to foreign markets, thus reducing beachhead costs. Given our data, we cannot rule out the possibility that companies may benefit from reducing friction when choosing export destinations. In fact, checks on alternative results presented in the following section allow us to show how foreign managers pave the way for an overall increase in the volume of activity by domestic firms that may (or may not) be associated with rising export shares.

4.4. Alternative outcomes

In this Section, we go beyond TFP and examine what other dimensions of the production process are mainly affected by the hiring of foreign managers. Firm-level TFP is a very useful measure that captures technology and efficiency as the portion of output growth of a firm that is not explained by input growth (Syverson, 2011). It helps to reconcile firms' microeconomic performance with aggregate welfare since higher aggregate productivity is a source of economic growth. However, we believe that looking at other firm-level indicators of productive performance can help complete our picture of the changes brought about by recruits.

Table 8
Alternative outcomes — ATE.

	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) Sales	(log) Sales	(log) Intermediates	(log) Intermediates	(log) Employees	(log) Employees	(log) Fixed assets	(log) Fixed assets	(log) Capital intensity	(log) Capital intensity
Hired × Post	.179*** (.072)	.039 (.074)	.207*** (.075)	.018 (.079)	−.011 (.063)	.002 (.070)	.192* (−105)	−.007 (.120)	.210*** (.074)	−.019 (.081)
R ²	.167	.220	.180	.230	.152	.247	.198	.233	.190	.230
No. of obs.	17,215	8258	17,215	8258	17,215	8258	17,215	8258	17,215	8258
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table reports estimates after a propensity score matching. The treatment is split between firms that hire foreign managers with and without specific industry experience abroad. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, regional employment density and, for the first column, the foreign subsidiary status. *, ** and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

In [Table 8](#), we focus on alternative outcomes, including firms' revenues, costs of intermediate inputs, number of employees, fixed assets, and capital intensity. The exercise we perform is similar to that in [Table 6](#) with a control group formed after a propensity score matching while keeping the most challenging specification with firm controls, region effects, industry-time effects, and pre-recruitment trends as from Eq. (1).

Interestingly, we find domestic firms have a higher volume of activity after hiring foreign managers. On average, they sell about 19.6% (log units: .179) more of their products and consume about 22.9% more intermediate inputs, indicating expansion plans that also entail additional investment. Our hypothesis seems to be confirmed by an average increase, albeit weakly significant, in fixed assets (21.2%; log units: .192), implying higher capital intensity (23.4%; log units: .210). Notably, no significant change is observed in the number of employees of domestic firms.

In line with previous results on TFP, foreign-owned firms do not register a significant change in any of the alternative firm-level outcomes that we test in [Table 8](#). We believe that the latter results support our earlier conjecture that foreign-owned firms do not view foreign managers as crucial for their productive strategy since any alignment in managerial practices or expansion plans may have occurred as a consequence of the takeover by foreign headquarters.

5. Sensitivity and robustness checks

In this Section, we present a battery of checks on the robustness and sensitivity of our results. Our first concern is that a specific TFP methodology does not affect our results. In [Table 9](#), we report results following three alternatives from the related literature: (i) the [\(Levinsohn and Petrin, 2003\)](#) algorithm was the first to propose intermediate inputs in a two-stage procedure that proxies unobserved shocks that potentially introduce a simultaneity bias due to unobserved adjustments in the combination of factors of production; (ii) [Wooldridge \(2009\)](#) proposed to solve the same simultaneity bias by implementing a generalized method of moments (GMM) procedure; (iii) [Ackerberg et al. \(2015\)](#) proposed another variant of our baseline, where we switch from a Cobb–Douglas to a trans-logarithmic production equation to capture more sophisticated functional forms. Our central tenets are robust across different TFP methodologies. However, the magnitudes may vary depending on the underlying productivity dispersions. The TFP premia are smaller than previous baseline estimates in [Levinsohn and Petrin \(2003\)](#) and larger in [Wooldridge \(2009\)](#).

In a second check, our concern is that our previous results may capture productivity gains of firms that are simply more active in labour markets and, therefore, hire the best managers, regardless of nationality. Indeed, a majority of firms in our sample hired foreign and domestic managers during our period of analysis. Since we can assume that higher manager mobility allows some proactive firms to reallocate productive resources faster, we challenge our results by applying a specific placebo test in [Table 10](#). In this case, we consider only the firms that hired UK managers as treated. We thus reset our control group by performing a propensity score matching, where we looked for nearest neighbours in the group of firms that did not hire managers during our period of analysis. The first column of [Table 10](#) shows that there is a weakly significant impact on domestic firms by recruiting British managers, but that is three times smaller than previous baseline estimates with foreign managers. In the third column of [Table 10](#), we also observe that most of the albeit weak impact by British managers is explained by those among them that had previous experience in the same industry of the recruiting firms. The latter result is in line with what we observe in [Section 4.3](#), although once again, we observe that the magnitude of the coefficient is much lower than in the case when we consider foreign managers. Columns 2 and 4 of [Table 10](#) report non-significant results when firms are foreign-owned.

A third check that we do is on the locations of the companies. Note that we previously controlled for the extent to which regions can attract foreign managers differently, as proxied by local employment density when matching recruiting firms with peers in the propensity score exercise in [Section 4.2](#). Yet, we still may find that estimates are sensitive to the heterogeneous distribution of recruitment events across regions. For this reason, in [Table 11](#), we first show estimates that consider the entire sample,

Table 9
Alternative TFP methods — Average treatment effects.

	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.025*** (.005)	.011 (.008)	.043*** (.007)	.017 (.019)	.098*** (.023)	−.002 (.190)
R ²	.945	.851	.953	.887	.956	.821
No. of obs.	16,696	8060	16,696	8060	16,696	8060
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes	Yes	Yes
Method	LevPet	LevPet	WRDG	WRDG	ACF-T	ACF-T

Note: The table reports estimates on a matched sample for alternative measures of TFP: (Levinsohn and Petrin, 2003) (LevPet); (Wooldridge, 2009) (WRDG); a translog variant of Akerberg et al. (2015) (ACF-T). Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Table 10
A placebo test: TFP and British managers.

	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.014* (.008)	.004 (.023)	.012 (.006)	.016 (.010)
Hired × Market × Post			.019* (.010)	.010 (.015)
R ²	.914	.868	.923	.945
No. of obs.	1586	987	1586	987
Firm controls	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes

Note: The table reports placebo estimates after treating firms with British managers only. The control group is made of firms that never hired any manager in the period of analysis. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, the share of managers on employees and, for the first column, the foreign subsidiary status. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

excluding Greater London, and then separate urban and non-urban areas. The division into urban and non-urban NUTS-3 regions follows Eurostat definitions based on relative population densities.⁷ The results for domestic firms are still significant, although to different degrees. Excluding London from the sample increases the TFP gains of domestic firms. Finally, recruiters in non-urban areas experience higher productivity gains, while the coefficients are relatively lower in urban areas. Following the latter evidence, we argue that the magnitude of TFP gains of domestic firms is higher at the margin, where productivity is *ex-ante* on average lower. Indeed, as widely expected, TFP levels in our sample significantly correlate with employment density in a firm's location (coefficient .715), even after controlling for local industrial specialization and different firm characteristics.

A fourth check that we consider important regards the specific nationalities of managers. In Table 12, we check that our results hold whether firms recruit a foreign manager with a passport from the United States or from any other country in the world. We think it is important to link this sensitivity check to our preliminary findings in Section 3.1, where we show that the most common nationality among foreign managers is American. We want to check that our results are not driven by lower cultural barriers among managers with English as their native language. Indeed, the impact on TFP is relatively higher when American managers are hired in domestic firms, but they stand also in the case of managers with different nationalities. We presume that there are unobserved characteristics of the managers that can play a role behind managers' passports. Among others, managers with a US passport are more likely to receive a better (managerial) education that they can bring with them in any workplace, while managers who have been educated in developing countries could not benefit from the same initial educational advantage of the U.S. citizens.⁸ Once again, we confirm no significant impact on foreign-owned firms.

A fifth concern we wanted to address is whether our results are affected by transition mechanisms when firms are the targets of mergers and takeovers. That is, we want to check that our results do not confound the recruitment of foreign managers with

⁷ Please note that, in this case, firms located in Northern Ireland are dropped as the classification of the region in urban vs non-urban areas is not straightforward from official sources at our disposal.

⁸ Our comment builds on what we know about the heterogeneity of managerial practices across countries, as briefly discussed in Section 2. Among others, see Bloom and Van Reenen (2010).

Table 11
Robustness checks: firms' locations — ATE.

	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.066*** (.025)	.019 (.019)	.127*** (.056)	−.001 (.033)	.022** (.012)	.014 (.023)
R ²	.955	.971	.954	.921	.949	.967
No. of obs.	15,146	7364	4709	2347	11,395	5552
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes	Yes	Yes
Firms' locations	w/o London	w/o London	Non-urban	Non-urban	Urban	Urban

Note: The table reports estimates on a matched sample to check for sample composition by firms' locations. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Table 12
Robustness checks: managers' passports — ATE.

	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.072*** (.034)	.020 (.084)	.039*** (.015)	.014 (.024)
R ²	.978	.961	.954	.919
No. of obs.	1601	977	15,719	6459
Firm controls	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes
Foreign manager's passport	US	US	non-US	non-US

Note: The table reports estimates on a matched sample to check for sample composition by managers' passports. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

changes on the ownership structure. Indeed, we find that 51 companies fundamentally changed their ownership structure in our sample. In Table A.3, we report our results after excluding from our sample these companies, and we notice how they are similar to the baseline coefficients.

Another important concern is that we could have better addressed our empirical strategy with a panel set up for difference-in-difference, like the one proposed by Callaway and Sant'Anna (2021), which is specifically designed for cases of multiple treatment timing. Briefly, we know from that literature that the results of a classical diff-in-diff and one that considers multiple treatment timing could be different if: (i) there is variation in treatment timing, i.e., one could observe a trend in when units are treated; (ii) the assumption of parallel trends holds only after conditioning on observed covariates. In Table A.4, we report the results after following the approach by Callaway and Sant'Anna (2021) with a doubly robust estimator and inverse probability weights when we include in the control group both firms that are never treated and firms that are not treated yet. Coefficients for domestic firms are slightly lower in magnitude than the baseline, while the impact on foreign firms is once again non-significant. Eventually, we prefer to keep our baseline approach in the previous sections because we do not observe a significant variation in treatment timing regarding recruiting events, and we already controlled for parallel trends conditional on observed firm-level characteristics

Importantly, in Table 13, we delve into firms' heterogeneity to check how sensitive our results are along firms' distributions by size, capital intensity and age. We limit our analysis to domestic firms only. In the first two columns of the table, we report results after splitting the sample into firms that record sales above and below the median threshold. What we find is that bigger firms register a higher impact on TFP after recruiting foreign managers. In the second two columns of the table, we performed a similar exercise by splitting the sample into firms that record above and below the median capital intensity. What we find is that only firms with a higher capital intensity benefit from foreign talents. Eventually, in the latest two columns of Table 13, we report results for younger and older sample firms considering a symbolic threshold of twenty years. We find a slightly higher coefficient magnitude for young firms, although confidence intervals partially intersect.

Notably, in Table 14, we check whether our results are driven by pre-existing diversity at the level of the managerial board when managers can already have different passports before the new recruits come. In the first two columns, we perform our estimates on a sub-sample made of firms where the managers were all British before recruiting a new foreign manager. In the final two columns, we perform our exercise on the subsample, including firms with foreign managers before the new recruiting events. What we find is that the marginal impact is twice as high on domestic firms where there was no previous managerial diversity. We comment that it makes sense that firms that introduce board diversity for the first time benefit the most at the margin. On the other hand, at

Table 13
TFP, foreign managers, and firms' heterogeneity.

	Domestic	Domestic	Domestic	Domestic	Domestic	Domestic
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.061*** (.015)	.025* (.013)	.041*** (.017)	.015 (.019)	.050*** (.020)	.038*** (.009)
R ²	.835	.815	.823	.897	.856	.844
No. of obs.	8320	8342	8226	8204	8054	8096
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes	Yes	Yes
Sub-sample	Bigger firms	Smaller firms	High cap. int.	Low cap. int.	Young firms	Old firms

Note: The table reports estimates on several matched sub-samples to explore how baseline results change by firms' heterogeneity: (i) bigger and smaller firms, splitting the sample above and below the median number of employees; (ii) high and low capital intensity, splitting the sample above and below the median capital intensity; (iii) New and old firms, splitting the sample between older and younger than 20 years. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Table 14
Robustness checks: TFP, foreign managers, and managerial diversity — ATE.

	Domestic	Foreign	Domestic	Foreign
Dep. variable:	(log) TFP	(log) TFP	(log) TFP	(log) TFP
Hired × Post	.069*** (.030)	.025 (.027)	.035*** (.015)	-.012 (.024)
R ²	.915	.921	.966	.958
No. of obs.	14,604	1976	2092	6084
Firm controls	Yes	Yes	Yes	Yes
Region effects	Yes	Yes	Yes	Yes
Industry × Year effects	Yes	Yes	Yes	Yes
Industry & age & size trends	Yes	Yes	Yes	Yes
Previous board composition	British only	British only	Already foreign	Already foreign

Note: The table reports estimates on a matched sample to check for sample composition by managers' passports. Coefficients are in log units. Errors are clustered at the firm level in parentheses. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, and regional employment density. *, ** and *** stand for $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

increasing levels of managerial diversity, we expect that the impact of a new foreign manager will be lower and lower. To support our findings, please consider the preliminary evidence reported in Table 2, from which we know that domestic firms without foreign managers (i.e., where diversity is null) are about 2.25% less productive on average.

On a side note, we observe that foreign-owned companies are also more likely to have a diverse managerial board than domestic firms. When we compute the ratios out of total managers, we observe that, on average, a foreign-owned firm has about 38% of managers from abroad vs. 5% in the case of domestic firms. Therefore, the latest robustness check is particularly helpful in checking also whether foreign managers' lack of a significant impact in foreign-owned firms was due to previously unobserved board diversity. Results in columns 2 and 4 of Table 14 show that this was not the case.

Finally, in Table A.5, we make our results robust to changing control groups, i.e., to check that they stand whether we compare with firms that, in our analysis period, either recruited British managers only or they never recruited any new manager. As expected, we retrieve a change in the magnitude of the impact, which is higher when we compare with firms that never hired on our timeline. In this case, we argue that it makes sense since firms that never recruited any manager in the analysis period are also the ones that may have been the least attractive to foreign talents.

6. Conclusion

To our knowledge, no work has yet addressed the primary relationship between foreign management and firm-level productivity. From our perspective, foreign managers are highly skilled migrants who contribute to transmitting knowledge across national boundaries. They play a special role in the organization of a company because they possess a combination of specific training experiences and soft skills. They transfer the knowledge acquired in previous positions to set the most suitable managerial practices that enable other workers to make the best contribution to the company's mission.

In this paper, we find that domestic manufacturing firms primarily benefit from hiring foreign managers. We find that their Total Factor Productivity (TFP) increases by 4.9% on average after hiring foreign talents. Recruiting highly skilled workers generally allows firms to access a broader pool of skills than those available in the domestic market. For foreign managers, we find that prior industry experience abroad qualifies their contribution to the competitiveness of the recruiting firms. Interestingly, beyond TFP, we find that the recruitment of foreign managers anticipates an increase in the volume of activity (sales and intermediate inputs) and higher investment in fixed assets, possibly due to the newcomers' expansion plans that increase the capital intensity of a domestic firm.

On the other hand, we do not find significant TFP gains for foreign-owned firms after they hire foreign managers. In this case, we argue that productivity spillovers may have already occurred at the time of acquisition by foreign headquarters when the subsidiaries became part of a multinational firm. Different specifications confirm the absence of a significant effect on foreign firms throughout our work. Interestingly, we show no statistical difference in productivity levels between domestic firms with foreign managers and foreign-owned firms.

Our identification strategy includes propensity score matching, diff-in-diff analyses, and the inclusion of pre-recruitment trends to challenge reverse causality and the parallel trends hypothesis. The results are robust to various controls, including a placebo test with local managers, the use of different TFP estimators, and controls for sample composition in terms of firm locations and managers' countries of origin.

Ultimately, we support the idea that the international composition of management teams is a dimension that deserves more attention from scholars studying the global reach of modern firms. From this perspective, we argue that emerging barriers to the circulation of highly skilled labour, including managerial talent, resulting from Brexit and the recent pandemic crisis are affecting the competitiveness of the domestic manufacturing industry.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix. Tables and graphs

See [Tables A.1–A.5](#).

Table A.1
Board, committee or department in which managers' belong.

Title	No. of managers-per-role
Senior management	65,207
Board of Directors	56,044
Operations & Production & Manufacturing	11,180
Sales & Retail	8,788
Finance & Accounting	6,279
Administration department	4,684
Human Resources (HR)	3,974
Information Technology (IT) & Information Systems (IS)	3,344
Purchasing & Procurement	3,233
Research & Development/Engineering	3,063
Marketing & Advertising	2,770
Health & Safety	677
Branch office	271
Legal/Compliance department	119
Product/Project/Market Management	119
Executive Committee	105
Audit Committee	57
Nomination Committee	56
Remuneration/Compensation Committee	52
Corporate Governance Committee	34
Supervisory Board	16
Risk Committee	11
Safety Committee	7
Executive Board	5
Environment Committee	4
Public & Government Affairs	3
Quality Assurance	3
Ethics Committee	3
Others	17,752

Note: The table shows the managers' roles in our sample. Each manager may have more than one role in the same company or may be involved in the management of more than one company at a time. We exclude from the original sources only shareholders and consultants who do not play a role in the company's day-to-day management. Please note that role designations are inconsistent across companies, as they may be based on the specific responsibilities assigned to individuals within the companies.

Table A.2
Top 10 origin countries of foreign-owned firms.

Nationality	No. of companies
United States	1201
Germany	357
Japan	264
France	241
Sweden	172
Switzerland	148
Ireland	131
Netherlands	128
Italy	93
Luxembourg	87
Others	935

Note: We define a foreign-owned firm following international standards (UNCTAD, 2016, 2009; OECD, 2005), according to which a subsidiary is controlled after a (direct or indirect) concentration of voting rights (>50%).

Table A.3
Robustness check: TFP and foreign managers — ATE, firms not targeted by mergers and takeovers.

	(1)	(2)	(3)
Dep. variable:	(log) TFP	(log) TFP	(log) TFP
Panel A: Domestic firms			
Hired × Post-recruitment	.047*** (.011)	.047*** (.010)	.048*** (.013)
R^2	.955	.956	.959
No. of obs.	16,618	16,618	16,618
Panel B: Foreign firms			
Hired × Post-recruitment	.007 (.021)	.009 (.020)	.008 (.020)
R^2	.967	.968	.968
No. of obs.	8036	8036	8036
Panels A, and B:			
Firm controls	Yes	Yes	Yes
Industry effects	Yes	Yes	
Year effects	Yes	Yes	
Region effects	Yes	Yes	Yes
Industry × Year effects		Yes	Yes
4-digit Industry & age & size trends			Yes

Note: The table contains estimates for a sample matched after a propensity score. We drop firms that have been the targets of mergers or takeovers in our analysis period. Errors are clustered at the firm level in parentheses. Coefficients are in log units. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, regional employment density and, for Panel A, foreign subsidiary status. *, ** and *** represent $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.4
Robustness check: TFP and foreign managers — ATT, considering multiple treatment timing.

	(1)	(2)
Dep. variable:	(log) TFP	(log) TFP
Domestic firms		
Hired × Post-recruitment	.035*** (.009)	.032*** (.0008)
No. of obs.	3910	3910
Foreign firms		
Hired × Post-recruitment	.025 (.032)	.021 (.035)
No. of obs.	18,550	18,550
Firm controls	No	Yes

Note: The table shows the average treatment effect on treated firms (ATT) after implementing the method proposed by Callaway and Sant'Anna (2021) for multiple treatment timing with a doubly robust estimator and inverse probability weights. ATE coefficients (in log units) are obtained as a weighted average that considers the importance of each cohort of firms. The control group includes firms that are never treated and firms that are not treated yet. *, ** and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.5
Robustness check: TFP and foreign managers, changing control groups.

	(1)	(2)
Dep. variable:	(log) TFP	(log) TFP
Panel A: Domestic firms		
Hired × Post-recruitment	.022*** (.012)	.071*** (.020)
R^2	.966	.965
No. of obs.	11,102	9406
Panel B: Foreign firms		
Hired × Post-recruitment	.008 (.018)	.012 (.008)
R^2	.965	.961
No. of obs.	7112	5604
Panels A, and B:		
Firm controls	Yes	Yes
Region effects	Yes	Yes
Industry × Year effects	Yes	Yes
4-digit Industry & age & size trends	Yes	Yes
Control group	Hiring British	Never hiring

Note: The table contains estimates for a sample matched after a propensity score. The first set of results is based on a control group of firms that recruited only British managers in our analysis period. The second set of results is based on a control group of firms that never recruited foreign managers in our analysis period, but they could have done in previous years. Errors are clustered at the firm level in parentheses. Coefficients are in log units. Firm-level controls include age, employment, capital intensity, average wage bill, skill intensity, regional employment density and, for Panel A, foreign subsidiary status. *, ** and *** represent $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.

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