

Barbarians at the gate? FDI and target firms' management quality

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Abstract

We analyse whether firms targeted by a foreign investor improve their management quality and practices after the acquisition, focusing on Foreign Direct Investments (FDI) occurring in Italy between 2010 and 2020. To proxy management quality, we resort to granular data on ISO certificates held by firms and find that those acquired by foreign investors experience an improvement in management standards, regardless of the country from which the FDI originates. This is not the case for firms involved in domestic M&As. Our empirical strategy controls for ex ante selection, and our findings show that the positive effects of FDI documented in the literature can be partly attributed to improved managerial practices implemented in target firms.

JEL Classification: F1; F2; D2; M1.

Keywords: FDI; M&As; Management quality; Foreign investors; Productivity.

1 Introduction

- Enzo Ferrari:** “Gentlemen, only one small question... If I wish to race Le Mans, and you don’t wish for me to race Le Mans, do we or do we not go?”
- Ford executive:** “Look, in that highly unlikely scenario... You do not go.”
- Enzo Ferrari:** “My integrity as a constructor, as a man, as an Italian is deeply insulted by your proposal. Go back to Michigan...”

(Ford v. Ferrari, [Mangold, 2019](#))

The movie dialogue above, in which a fictional Enzo Ferrari goes on obnoxiously insulting the Ford Motor Company and its CEO Henry Ford II, in a way shows how reluctant companies’ founders can be when facing acquisition offers by foreign investors, especially when these entail a significant loss of powers over the management of the entity. However, the broad literature analysing the impact of FDI on destination economies mostly agrees that foreign investors improve the performance of recipient firms, both in terms of productivity and profitability (see, for instance, [Braguinsky et al., 2015](#) and [Bircan, 2019](#)). This may happen because FDI bring in fresh capital and liquidity helping target firms to lever unexploited growth opportunities ([Harrison et al., 2004](#) and [Héricourt and Poncet, 2009](#)), improve their financial conditions ([Bamiatzi et al., 2017](#); [An et al., 2021](#)), increase innovation activity carried out by the recipient firm ([Guadalupe et al., 2012](#); [Stiebale, 2016](#)), or thanks to technological and knowledge spillovers ([Mattoo et al., 2004](#); [Sinani and Meyer, 2004](#); [Branstetter, 2006](#); [Abebe et al., 2022](#); [Hu et al., 2023](#)). The latter relates to know-how transfers from the parent to the target company (and possibly to other domestic firms), about production processes, organisational forms, foreign markets, and, of course, managerial practices. As for the latter, some authors show that multinationals offer additional training to managers compared to local firms ([Gershenberg, 1987](#)), transfer techniques for inventory and quality control, and incentivise subsidiaries to increase their managerial efforts and adopt the parent company’s procedures (see [Blomström and Kokko, 1998](#) for a more detailed discussion). Different studies provide evidence of such managerial spillovers triggered by FDI in target firms (e.g. [Child et al., 1999](#); [Child et al., 2000](#); [Fu,](#)

2012). The influential papers by [Bloom and Van Reenen \(2010\)](#) and [Bloom et al. \(2012\)](#) on management practices remark on how foreign multinationals are denoted by higher management quality than their domestic counterparts and seem to partially transfer their better standards abroad. However, management quality is difficult to measure, and such studies employ survey data to investigate the phenomenon. Therefore, the empirical analysis is conducted on samples that, although to varying degrees, are limited in size.

The aim of this paper is to investigate whether the beneficial productivity effects of FDI found in most of the literature stem, at least in part, from the adoption of better management procedures by firms acquired by foreign entities. To do so, we resort to data on ISO (International Organization for Standardization) certifications held by Italian firms. This strategy allows us to proxy management quality for the universe of Italian firms and provide detailed evidence of the role of foreign investors in improving management practices.

The Italian context is particularly suited to our purposes. Since the transition of developed countries from a traditional production system to a knowledge economy, Italy has indeed suffered from a severe slowdown in its productivity. Different contributions show that the recent underperformance of the Italian economy depends on the reduced innovation capacity of domestic firms ([Bugamelli et al., 2018](#)), and their inability to take full advantage of the Information Technology revolution ([Pellegrino and Zingales, 2017](#)). As shown by [Schivardi and Schmitz \(2020\)](#), the divergent patterns in productivity between the Southern and Northern European economies can be ascribed to inefficient management practices, which limited Southern Europe's gains from the IT Revolution.¹ Importantly, their general equilibrium model suggests that the most promising policy intervention for productivity enhancement would be incentivising multinationals from countries with superior managerial capabilities to invest in Southern Europe. The latter would benefit from management quality spillovers.

In this paper, we provide some micro-level evidence on the role of foreign investment on Italian target firms' managerial capabilities. Many of the issues determining the poor performance of Italian economy, as suggested by the literature, can be traced back to the peculiar structure of domestic firms. The Italian industrial structure comprises small,

¹Similar findings are documented also by [Nicoletti et al. \(2020\)](#).

family-owned, and rather conservative firms. If cultural and structural factors of domestic firms have determined the poor performance of the economy, investors from more thriving contexts should be able to increase their growth prospects.

We focus on cross-border M&As occurring in Italy between 2010 and 2020 and show that, after the arrival of the foreign shareholder, target firms improve their management standards, measured by the total number of active ISO certificates and by the probability of obtaining a specific certificate dealing with management quality. This happens both if the investor comes from an advanced or emerging economy, suggesting that Italian companies would benefit from a greater openness to foreign investors.

The rest of the paper is organised as follows. Section 2 provides a review of the literature related to our study. In Section 3 we describe the data used in the empirical analysis and some preliminary evidence. Section 4 presents our main findings, while in Section 5 we perform a number of robustness tests. Finally, Section 6 concludes.

2 Related literature

FDI are a significant source of capital and mechanisms for knowledge and technology transfer, making them an essential component of economic growth and development. As such, there is a substantial body of literature that analyses the impact of FDI on the origin and destination economies. Mainly, research has focused on the effect of foreign investment on the target firm’s performance in terms of productivity and profitability. [Braguinsky et al. \(2015\)](#) show that acquisitions improve both dimensions, while [Bircan \(2019\)](#) shows that acquisition by a multinational corporation increases the capacity of production plants. Moreover, not only do FDI positively impact the target firm, but also influence its entire sector. In fact, they increase competition, reduce costs, and force less efficient firms to leave the market. These results substantiate that “backward vertical spillovers” produce a favourable effect on the productivity of sectors that foreign investors have targeted ([Javorcik, 2004](#)).

First of all, FDI can be seen as a source of fresh liquidity, which may boost target firms’ potential. [Héricourt and Poncet \(2009\)](#), using a firm-level dataset on Chinese companies, document that foreign investors reduce the financial constraints of acquired firms, allowing

them to increase their investment activities. [Manova et al. \(2015\)](#) find similar results and show that the relaxation of credit constraints brought about by FDI enables target firms to better access foreign markets through exports. This happens because foreign affiliates can exploit foreign capital markets or borrow from their parent company. Notably, [Harrison et al. \(2004\)](#) document a reduction of financial constraints due to foreign investments in both developed and developing countries. Accordingly, [Alquist et al. \(2016\)](#) claim that liquidity issues are among the most prominent causes leading firms to look for foreign shareholders. For instance, when financial crises tighten credit conditions in the domestic economy, FDI are more likely. In general, FDI are found to improve the financial soundness of target firms ([Bamiatzi et al., 2017](#); [Bentivogli and Mirenda, 2017](#)).

Foreign investors may also influence the innovative activity of the target company. According to [Guadalupe et al. \(2012\)](#), companies that receive FDI demonstrate a greater degree of innovation intensity compared to non-acquired companies. Similarly, [Stiebale \(2016\)](#) notes that cross-border mergers and acquisitions result in a higher level of innovation in the newly formed entity. However, the degree of enhancement in innovation intensity depends on the characteristics of the parent company.

Related to our work, [Bencivelli and Pisicoli \(2022\)](#) show that Italian firms targeted by a foreign investor experience a rotation in their financial structure, making use more intensively of the non-bank financial channel, and this increases their investment capacity, especially in intangible assets. The authors recognise that the financial rotation, favouring more sophisticated instruments, hints at an improved managerial structure of target firms. In fact, FDI have long been recognised as carriers of technology and knowledge from the country of origin to the recipient economy. In their theoretical model [Mattoo et al. \(2004\)](#) distinguish FDI according to their mode of entry (greenfield and acquisition) and show that, for high costs of technology transfer, the welfare in the recipient country is generally higher under acquisitions. Empirical studies have generally confirmed that foreign investors transfer technology to the target company, help them improve production processes, introduce new products, and improve operational efficiency ([Veugelers and Cassiman, 2004](#); [Iwasaki and Tokunaga, 2016](#); [Hu et al., 2023](#)). However, [Sinani and Meyer \(2004\)](#) show that the magnitude of the spillover may depend on a number of specific characteristics of

the target firm, such as its size, ownership structure, and trade orientation. Importantly, not only is the recipient firm affected, but there are indirect effects at work, too. In fact, the beneficial effects spill over to other domestic firms operating in the same context in which foreign investment takes place. Focussing on Ethiopian plants, [Abebe et al. \(2022\)](#) document how technology upgrade occurs more frequently due to competition in the output markets and imitation in the same line of business. Other positive contributions consist of better management and knowledge about exports. Spillovers are observed among domestic plants in all geographic districts where a large greenfield foreign plant operates.

Our paper builds on this line of research and focuses, in particular, on spillovers from FDI to acquired firms in terms of management quality. Other studies have already investigated this issue. [Child et al. \(1999\)](#) and [Child et al. \(2000\)](#) analyse UK firms acquired by foreign investors and show that acquisitions were often followed by significant changes in management practice, especially towards performance-related rewards and a greater emphasis on quality. Similar results are provided by [Fu \(2012\)](#). The most influential strand of literature on this topic has been introduced by [Bloom and Van Reenen \(2010\)](#) and [Bloom et al. \(2012\)](#). The authors show that US multinationals have experienced a *productivity miracle* thanks to their superior managerial practices. Notably, when investing in Europe, they seem to transfer their superior business models to their overseas affiliates, which, thus, perform better than the domestic firm. Given their higher scores on “people management” practices, American multinationals better exploit information technology. In addition, they appear to have transferred these management practices abroad, so that their foreign affiliates also enjoy productivity benefits. As shown by [Bloom and Van Reenen \(2007\)](#) and [Bloom et al. \(2019\)](#), superior managerial practices are generally related to better firms’ performance, in terms of productivity, profitability and survival rates.

However, the studies recalled above rely on survey data to measure management quality. In contrast, we employ valid ISO certificates at the firm level to proxy our variable of interest. An extensive number of studies on ISO certificates can be found in the management literature (see [Heras-Saizarbitoria and Boiral, 2013](#) for a broad review). They usually focus on the benefits coming from the adoption of specific ISO standards and their general conclusion is that certificates entail clear benefits on operational, people and customer

results by certified firms (Tari et al., 2012). On the other hand, the economic literature rather overlooks such data. Recently, Bolatto and Pignataro (2023) proposed a theoretical model in which small and medium enterprises adopt ISO standards as a signaling device to increase their chances of being selected as suppliers by large global players, confirming the empirical results of Terlaak and King (2006). The latter focus on a large panel of US manufacturing firms and find that facilities that certify with ISO 9000 experience a greater increase in production volume subsequent to the certification than non-certified ones. They suggest that firms use the certification to communicate to buyers their underlying organisational quality, that otherwise would be difficult to explicitly observe. Hence, the certification allows buyers to identify suppliers with better quality attributes, which, consequently, grow faster. Other examples of articles using ISO standards are found in the development (Paunov, 2016) and environmental economics (Johnstone and Labonne, 2009) literature. Similarly to Bourke and Roper (2017), we interpret ISO certificates as proxies for management quality and, therefore, we use them to study whether foreign-acquired firms in Italy increase the number of active certificates after the FDI.

3 Data and stylised facts

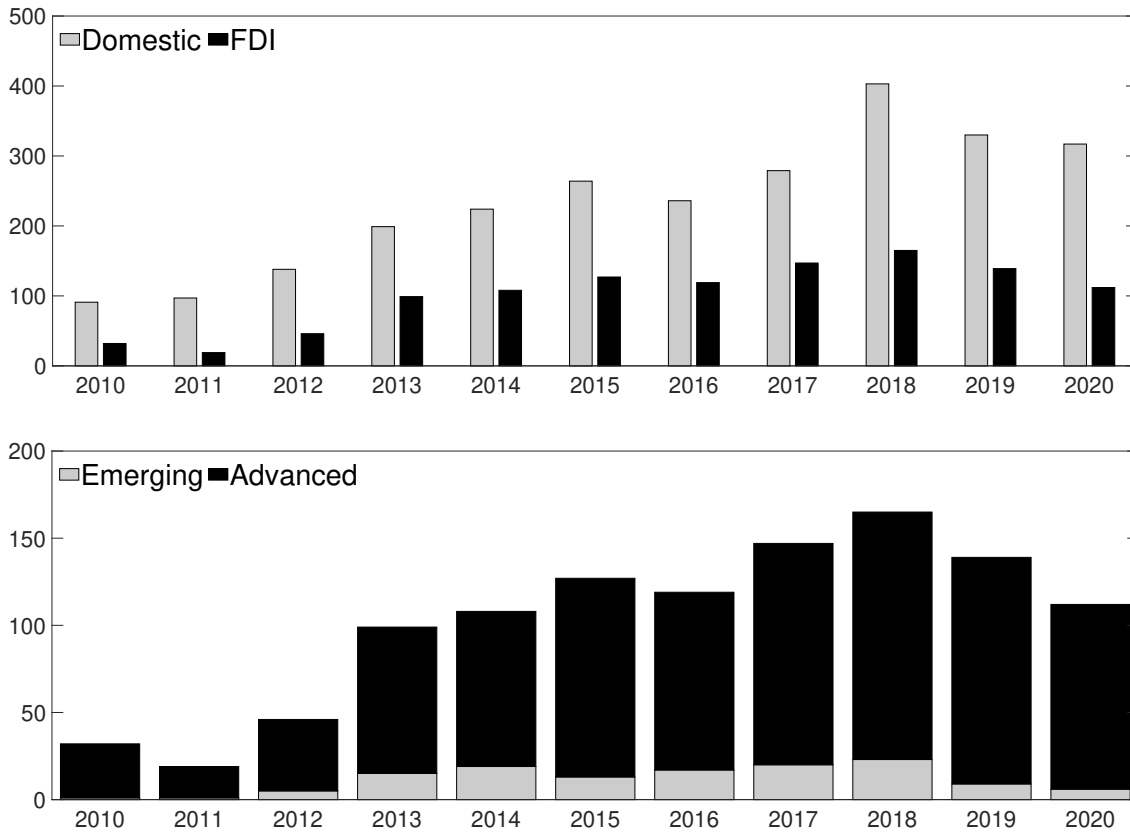
We retrieve data from different sources. First, we use Zephyr by Bureau Van Dijk (2023) to collect information on cross-border and domestic M&As occurring in Italy. Second, to measure management quality, we use detailed administrative data provided by Accredia (2023), the Italian public accreditation body, on firms certified according to ISO standards. Finally, we merge these data with a granular dataset that contains information on the balance sheet of the universe of Italian companies from 2010 to 2020, Aida by Bureau Van Dijk (2021). In this section, we provide additional information on the data and some preliminary results.

3.1 FDI and domestic M&As

We define FDI as cross-border acquisitions, i.e. operations where a foreign entity buys a relevant stake in an existing Italian firm, group, subsidiary, or branch not previously

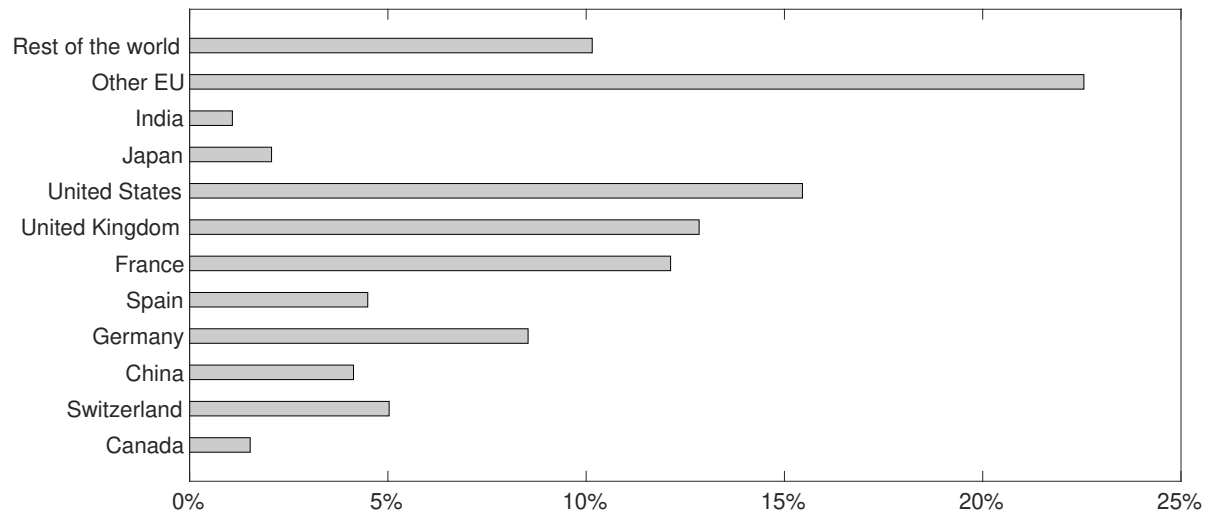
invested in from abroad. In the literature, these investments are identified as brownfield, as opposed to greenfield, i.e. operations consisting of investors setting up a new entity in a foreign country. The reason to exclude greenfields from our study is twofold: (i) the predominance of M&As in the total FDI flows, and (ii), most importantly, the need to identify a clear break in the life of target firms.

Figure 1: Top panel: FDI and domestic M&As by year. Bottom panel: FDI from Advanced countries vs Emerging countries by year.



FDI are defined as “investments reflecting a lasting interest and control by a foreign direct investor, resident in one economy, in an enterprise resident in another economy (foreign affiliate)” (UNCTAD, 2019). The definition underscores the concept of “lasting interest and control” and excludes foreign portfolio investments. This is particularly relevant for our purposes, since our goal is to analyse the effects regarding managerial spillovers from the foreign entity to the target firm. These are likely to show up only when the foreign investor can exert a certain influence on the target firm. In practical terms, the IMF, OECD,

Figure 2: FDI's countries of origin.



UNCTAD and the World Bank consider as FDI all investments that lead to an ownership share of at least 10% by a foreign entity. We follow this definition and retrieve only deals above such a cutoff.

Zephyr by [Bureau Van Dijk \(2023\)](#) is among the most credible sources of M&As ([Bollaert and Delanghe, 2015](#)). It has the benefits of providing a vast array of information on the acquirer and target firm, relevant dates of the deals, and defining for each firm the Global Ultimate Owner. It also provides data on rumours, i.e. information on rumoured acquisitions that were ultimately not completed.

We retrieve information on all deals that occurred in Italy between 2010 and 2020. We consider FDI those operations in which a firm (located abroad or whose Global Ultimate Owner is foreign) buys a share of at least 10% of a firm located in Italy. We also include deals in which the foreign entity increases its share in the Italian one, and the minimum 10% threshold is reached. We also retrieve data on domestic M&As occurring in the period under scrutiny. Even in this case, we consider the minimum 10% cut-off. We exclude deals in which the target operates in the financial sector since such firms follow specific strategies whose study is beyond the scope of this paper. Overall, our sample considers 1,113 foreign operations and 2,578 domestic M&As.

Figure 1 provides information on the temporal distribution of domestic and cross-border

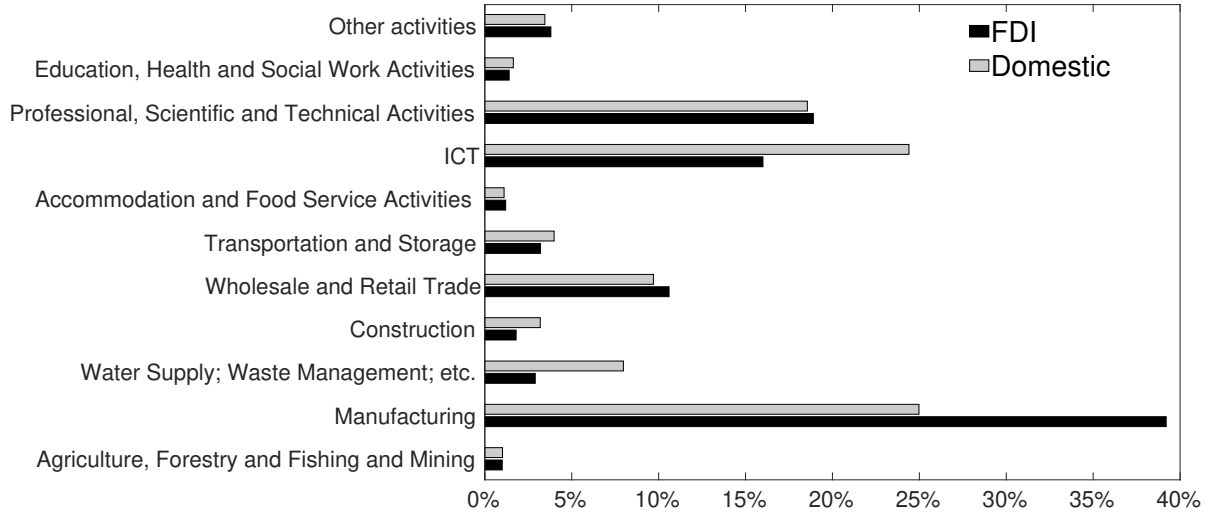
M&As. The initial years of the sample are characterised by the turmoil of sovereign debt that affects European economies. Hence, the number of both domestic and foreign deals is particularly low. Operations start to increase in 2013, peak in 2018, and then slightly decline. Despite the Covid-19 pandemic, in 2020, more than 300 domestic operations and 100 FDI were completed. Since we expect that especially foreign investors from advanced economies improve the management of target firms, in the bottom panel of Figure 1 we disentangle foreign deals into two categories: deals originating in advanced and emerging economies, respectively. The bulk of FDI comes from advanced economies. Even if the number of deals originating in emerging countries increased over time, it is still limited to 23 at its peak in 2018. In fact, as shown in Figure 2, the main countries of origin are the United States, the United Kingdom, France, and Germany. A non-trivial share of deals originated from China, the first emerging economy in terms of FDI targeting Italian firms.

Regarding destination sectors, foreign investors seem to abnormally target firms in manufacturing with respect to domestic deals (Figure 3). On the contrary, foreign entities seem to be less interested in the domestic Information and Communication industry, contrary to Italian acquirers. Still, the sector ranks third among FDI, after manufacturing and Professional, Scientific, and Technical activities, potentially questioning the acquisition of advanced technology by foreign firms and reverse internalisation issues. In general, the distribution of the recipient industries follows the nature of the domestic production system, which is largely based on manufacturing and trade.

3.2 ISO certificates

Measuring management capabilities at the firm level is a challenging issue. Management quality is a multifaceted phenomenon, and data are scarce. Indeed, previous studies on the matter relied primarily on survey data (Bloom and Van Reenen, 2007; Fu, 2012) or proxied management quality with the level of education of CEOs (Chevalier and Ellison, 1999; Palia, 2000). In this paper, we resort to data on ISO (International Organization for Standardization) certifications for proxy management quality. The ISO is an independent, non-governmental organisation that develops and publishes international standards in all

Figure 3: Sectors of destination. FDI and domestic M&As.



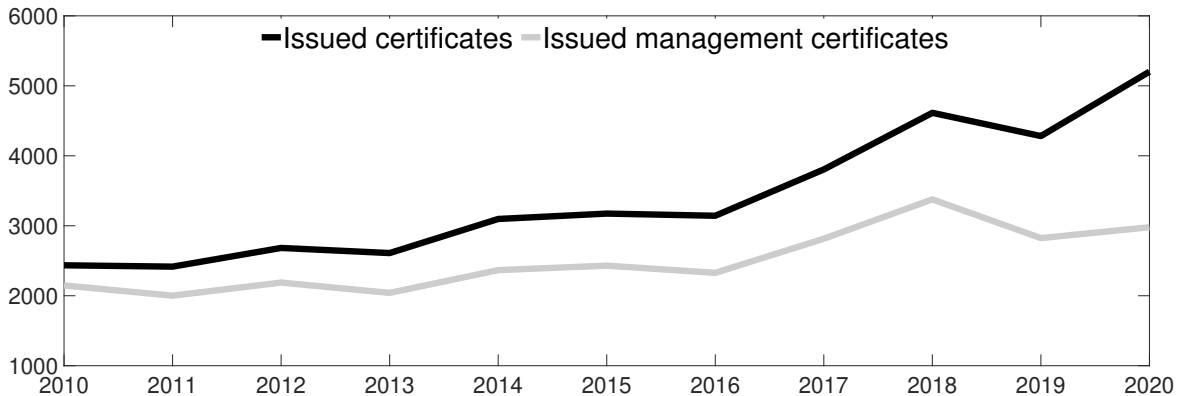
technical and non-technical fields, internationally agreed by experts.²

We retrieve data for Italian firms holding ISO certificates from the public database by [Accredia \(2023\)](#), the Italian public accreditation body. It lists details of firms holding any ISO certification, e.g. date of certification, type of certification, fiscal code of the firm, validity, etc. From the data, we create two variables. First, we focus on the ISO 9000 family, which directly involves quality management systems. To obtain the certification, independent entities (certification, inspection, and verification bodies) authorised by the State evaluate seven pillars (Customer Focus, Leadership Importance of Top Management, Engagement of People, Process Approach, Improvement, Evidence-Based Decision-making, and Relationship Management) in candidate firms. The first edition of the standard was launched in 1987 and has gone through four revisions since then, with the last update released in 2015.³ Second, since other standards provide information on management prac-

²As of 2023, the ISO has developed over 24,676 standards, whose scope covers a wide variety of issues regarding firms' lives and operations, from manufactured products and technology to food safety, agriculture, and healthcare.

³The most widespread standard in the family is ISO 9001. It is based on the plan-do-check-act methodology, providing a process-orientated approach to documenting and reviewing the structure, responsibilities, and procedures required to achieve effective quality management. For instance, it deals with: requirements for a QMS, including documented information, planning, and determining process; responsibilities of management; management of resources, including human resources and workplace environment; product realisation, including the steps from design to delivery; measurement, analysis, and improvement of the

Figure 4: Number of ISO9000 (grey line) and total certificates (black line) issued by year.

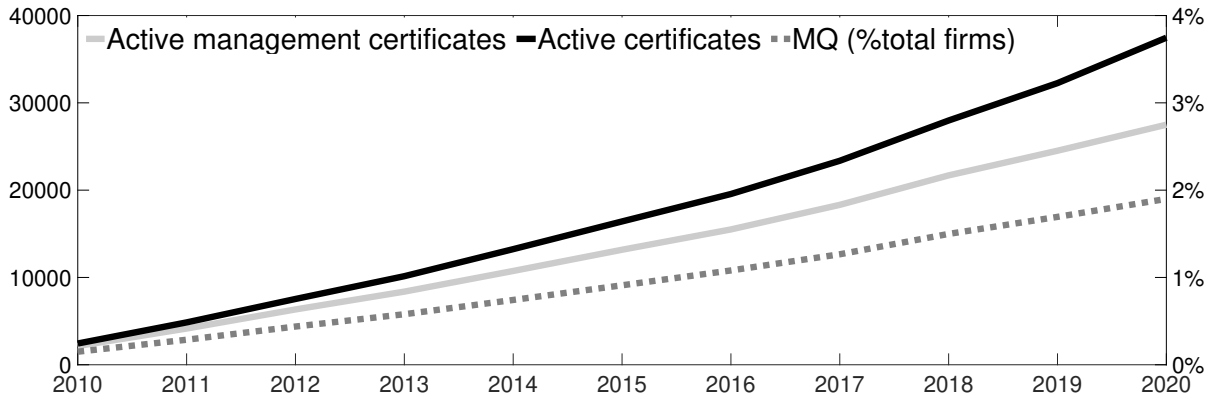


tises and capabilities of firms, we retrieve information on all ISO standards held by Italian firms. This set includes, among others, ISO 20121 “Event sustainability management systems”, ISO 22301 “Societal security - Business continuity management systems”, ISO 28000 “Security and resilience – Security management systems” of supply chains, ISO 14001 “Environmental management systems”, and other industry-specific certificates (see Table A1 for the full list of Accredia standards).

The ISO 9000 standard was first published in 1987. However, our balance sheet data are available only from 2010. Our aim is to test whether firms targeted by an FDI improve their management after the arrival of the foreign investor. But FDI can also target firms that already hold management certificates in 2010 because they value their higher trustworthiness or are more recognisable in the business community. Hence, to avoid biased results that would emerge by not accounting for certificates obtained before 2010, we decided to eliminate such firms from the sample. Only newly certified firms since 2010 are included in our dataset. Figure 4 presents information on the yearly certification activity of Italian firms since 2010, that is, the number of *issued* certificates per year. The black line considers the total number of ISO standards obtained by Italian firms, while the grey line focuses on ISO 9000. On average, 2,500 firms per year obtained a management certificate

QMS through activities like internal audits and corrective and preventive action. The changes introduced in 2015 were motivated by the need for the standard to adapt to the changing environments in which organisations operate. Some updates include an increased emphasis on risk-based thinking to enhance the application of the process approach, improved service applicability, and increased leadership requirements.

Figure 5: Number of active ISO9000 (grey line, left-hand axis), total certificates (black line, left-hand axis), and percentage of firms with an active ISO9000 (dotted grey line, right-hand axis).



in the period under scrutiny. On the other hand, the annual average of the total certificates obtained by Italian companies is 3,406. Certification activity has intensified over the years, with a boost in 2017.

Once obtained, each certificate has a certain validity and can be renewed or expires. Accredia provides information on the validity status of certificates. In practical terms, firms tend to renew certificates over time. Hence, in Figure 5 we present the yearly number of active certificates. Of course, the two lines increase over time since they represent cumulative numbers.⁴ As of 2020, Italian firms hold a total of 37,461 ISO certificates, while 27,495 firms adhere to an ISO 9000 standard. The latter represents less than 2% of Italian firms (dotted grey line with the scale on the right axis).

In our empirical analysis, we will consider two variables as proxies for quality management. First, we create a dummy MQ that takes the value 1 if firm i has an active ISO 9000 certificate at time t , 0 otherwise. Second, we also use the count variable $Cert. Intensity$, i.e. the total number of active certificates held by firm i at time t , to provide a more comprehensive picture of the quality of managerial practices.

⁴For instance, in 2013, the number of active certificates is the sum of certificates issued in 2010, 2011, 2012, and 2013 (minus sporadic cases of expired certificates).

3.3 Balance sheet information

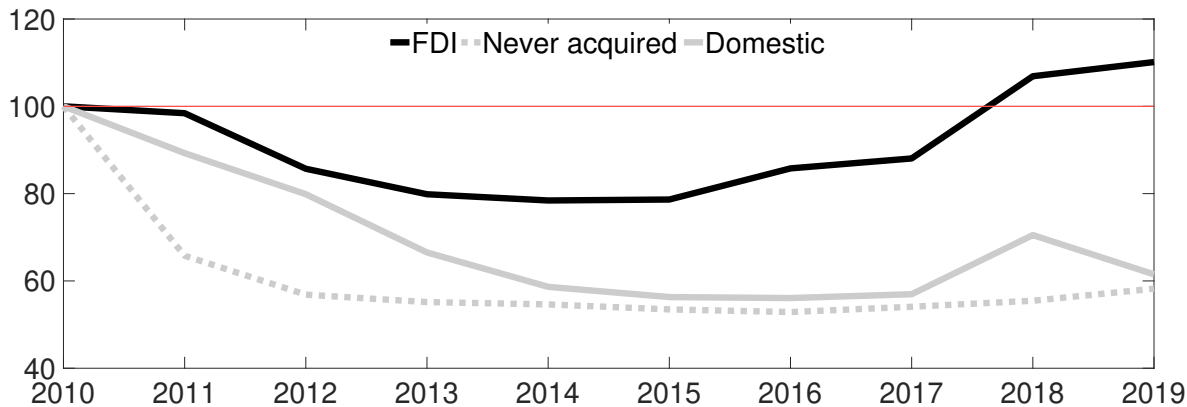
We merge the FDI and certification data with the Aida balance sheet information by [Bureau Van Dijk \(2021\)](#). The database provides balance sheet data for the universe of Italian firms. It consists of 17,810,330 observations from 1,751,829 unique firms from 2010 to 2020. Since the purpose of the paper is to study whether the arrival of foreign investors leads target firms to improve management practices, as measured by their certification activity, we need to exclude firms that received a foreign investment before 2010. These firms have already experienced the structural break brought about by the foreign investor, hence including them in the sample would bias our results. To do so, we deem as already foreign those firms targeted by an FDI between 1997 (the first year for which Zephyr reports data) and 2009. We eliminate such firms from our dataset. Of course, some firms may have received investment from abroad well before 1997. We cannot account for these companies, since Zephyr data are available only from 1997. However, the potential bias should be of limited magnitude since it is fair to say that the effects on management quality coming from FDI that occurred before 1997 have nowadays vanished.

3.4 Stylized facts and preliminary results

In [Figure 6](#), we report the evolution of average productivity, measured by sales over employees, for three groups of firms: firms that will eventually be acquired by a foreign investor, firms that will eventually be involved in a domestic operation, and never acquired firms.

Of course, the interpretation of the results should be cautious, since it does not consider the specific year of acquisition and does not take into account the *ex-ante* selection affecting acquisition decisions. However, the chart still provides a flavour of the phenomenon under scrutiny and reveals a number of interesting facts. First, all groups of firms experience a drop in productivity from 2011 to 2015. The severity of the slowdown is different and ranges from the 20% experienced by FDI firms to the more than 40% that characterise never-acquired firms. It confirms a general macroeconomic trend of productivity slowdown in the country in the wake of the European sovereign debt crisis. Second, since 2016, FDI firms have experienced a reverse pattern. Productivity shows an upward trend for such firms. This does not happen for the other two groups of firms. Finally, productivity overall

Figure 6: Evolution of productivity for FDI, domestically acquired and never acquired firms (2010=100).



has increased in the period 2010-2019 for the former set of firms, while never acquired firms and those targeted by a domestic investor still show a strongly reduced productivity in 2019 with respect to 2010. Hence, acquisitions by foreign investors seem beneficial to Italian firms. This result is confirmed by multivariate regressions of productivity on the FDI dummy (not reported for brevity).

Are our proxies of management quality relevant for productivity? Table 1 presents preliminary evidence on the effect of *MQ* and *Cert. Intensity* on productivity. Firms with management practices certified by an ISO 9000 certificate enjoy an increase in productivity of about 8%. Also, an additional ISO certificate results in an increase in productivity of approximately 7%. Hence, improving management practices appears to be a promising strategy for improving firms' performance.

In Table 2, we also provide some evidence of the effect of foreign acquisitions on management quality. The variable *FDI_after* is a dummy that takes the value 1 since the firm *i* is acquired by a foreign investor onwards. It is a traditional post-treatment dummy. Similarly, *FDIADV_after* takes value 1 since firm *i* is acquired by a foreign investor from an advanced economy onwards. Again, the results in this section do not take into account endogeneity in the form of *ex-ante* selection affecting the decision of a foreign investor to buy certain firms and should therefore be interpreted as preliminary evidence. Still, Table 2 shows that the arrival of a foreign investor is beneficial to the management quality of the target firm, both in terms of *MQ* and the total number of ISO certificates obtained

Table 1: Effect of management quality and certificate intensity on productivity.

	(1)	(2)	(3)	(4)
VARIABLES				
MQ	0.079*** (0.004)		0.081*** (0.004)	
Cert. Int.		0.068*** (0.003)		0.067*** (0.003)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Year*Sector FE	No	Yes	No	Yes
Year*NUTS2 FE	No	Yes	No	Yes
Observations	6,030,109	6,030,109	5,903,352	5,903,352
R-squared	0.757	0.757	0.759	0.759

NOTES: Dependent variable: sales over employees (ln). Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

by the firm. Investors coming from an advanced country, however, do not seem to enjoy any benefit. Apart from column 8, the coefficients of *FDIADV_after* align with those of *FDI_after*.

Table 2: Effect of FDI on management quality and certificate intensity.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) Cert. Int.	(6) Cert. Int.	(7) Cert. Int.	(8) Cert. Int.
FDI_after	0.016*** (0.003)		0.009** (0.005)		0.069*** (0.006)		0.067*** (0.009)	
FDIADV_after		0.015*** (0.003)		0.008* (0.005)		0.068*** (0.007)		0.071*** (0.010)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	Yes	Yes	No	No	Yes	Yes
Observations	13,699,050	13,699,050	5,984,852	5,984,852	13,699,050	13,699,050	5,984,852	5,984,852
R-squared	0.657	0.657	0.717	0.717	0.664	0.664	0.724	0.724

NOTES: Dependent variable is the number of valid ISO certificates of firm *i* at time *t*. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

Overall, the empirical evidence presented in this section shows that foreign investors have the potential to improve Italian target firms' performance and that such a result may be traced to increased managerial capabilities brought about by the investor, regardless of the country of origin. Although the analysis uses a very granular dataset, it does not

take into account *ex-ante* selection in the form of cherry picking or lemon grabbing, two conflicting but widely documented phenomena that explain acquisition decisions by foreign investors; therefore, it cannot be interpreted in causal terms. In the next section, we take a step toward such a direction.

4 Empirical strategy and findings

Previous results do not take into account endogeneity issues arising in our empirical setting. In fact, the general literature concludes that foreign investors do not target firms at random. On the contrary, several contributions document that foreign investors tend to acquire the best performers in the country of destination, a phenomenon known as cherry picking (Almeida, 2007; Guadalupe et al., 2012). On the other hand, other authors (Nocke and Yeaple, 2007; Neary, 2007; Lichtenberg et al., 1987) find that foreign investors usually target firms in distress (lemon grabbing) in order to restructure them or because they are a cheaper option to enter the local market. In both cases, it is clear that endogeneity arises in the form of *ex-ante* selection: firms targeted by a foreign investor systematically differ from never-acquired firms. This conjecture is confirmed by Table 3, which reports differences in mean for a number of variables between FDI firms (in the year of acquisition) and the rest of Italian firms. It shows that FDI firms, in the year of investment, are on average bigger, more productive, less profitable, more tangible-oriented, and with better growth perspectives than the rest of the sample. Moreover, they already have on average more management certificates than the universe of Italian firms, and not taking into account such *ex-ante* selection would bias our empirical results.

The literature on foreign investment proposes several methods to deal with such a phenomenon. Most studies in this line of research use Propensity Score Matching (Rosenbaum and Rubin, 1983) to obtain a valid control group of ex-ante similar firms to the acquired ones. However, recently, the algorithm was criticised in an influential paper by King and Nielsen (2019). The authors show that the use of PSM increases imbalances and exacerbates research discretion, leading to biased conclusions. To avoid the King and Nielsen (2019)'s critique, in this paper we prefer to resort to some natural control groups. Indeed, since our dataset also reports information on firms targeted by a domestic M&A, we use

Table 3: Comparison of FDI-firms in the year of acquisition with other firms (means).

Variable	FDI	Other firms	t-test
Productivity (ln)	5.435	3.848	***
Employment (ln)	3.231	1.394	***
Wage costs (ln)	6.903	2.875	***
Tang. Ass/Empl (ln)	3.170	2.197	***
Assets (ln)	9.302	5.730	***
Net income	1864	36	***
ROE	4.363	7.600	**
Age (ln)	2.585	2.139	***
Cash/Assets	0.001	0.030	***
Assets growth (%)	0.159	0.063	***
Cert. Int.	0.140	0.012	***
MQ	0.072	0.009	***

NOTES: *** p<0.01, ** p<0.05, * p<0.10

the latter as controls. This set of firms, indeed, is likely to be very similar to the set of those acquired by a foreign investor, since the factors leading foreign entities to invest in certain target firms can be fairly considered the same to those leading to a domestic acquisition. The *ex-ante* selection is mitigated without recurring to matching procedures that could add noise and imbalance. A growing number of studies in the literature is adopting this approach, that is, comparing foreign acquired firms with domestically acquired firms (e.g., Wang and Wang, 2015; Fons-Rosen et al., 2021). It identifies the causal effect of FDI more clearly by isolating the “foreign component” of acquisitions from the acquisition. However, in these contributions, the control sample is obtained via a PSM. Hence, we also implement such a procedure to check the sensitivity of our results. Moreover, in the next section, we also test the robustness of our results by changing the relevant control group.

Table 4 reports results coming from a Diff-in-Diff regression of the following form:

$$MQ_{i,t,s,r} = \alpha + \beta_1 X_{i,t,s,r} + \Gamma Controls_{i,t,s,r} + \delta_i + \lambda_t + \phi_{t,s} + \eta_{t,r} + \epsilon_{i,t,s,r}, \quad (1)$$

where the dependent variable takes value 1 if firm i has a valid ISO 9000 certificate at time t and where X is alternatively *FDI_after*, *DOM_after* and *FDI_ADV_after*. Γ includes

a number of firm level controls, δ_i are firm fixed effects, λ_t are year fixed effects, $\phi_{t,s}$ are year*sector fixed effects and $\eta_{t,r}$ are year*region fixed effects. Sectors are 4-digit Nace rev. 2 sectors, while regions are NUTS2 units according to the nomenclature of the European Union.

In columns 1, 2, and 3 we only include firm fixed effects. We then progressively move to saturated regressions that also control for year*sector and year*NUTS2 fixed effects (columns 4, 5, and 6) and other firm-level controls (columns 7, 8, and 9). Results from the most parsimonious model show that, both after a foreign acquisition and a domestic one, the probability of obtaining a management certificate increases by about 3% (15% one standard deviation). However, when we saturate the regression any effect vanishes. It seems that neither foreign nor domestic M&As improves the management quality of acquired firms. However, Table 5 provides a different picture. we replicate the same structure of Table 4 by replacing the dependent variable with the number of total valid ISO certificates of firm i at time t (*Cert. Intensity*). First, the impact of *FDI_after* is always positive and strongly significant. Foreign investors bring about an increase in the number of valid certificates of between 29% (column 1) and 8% (column 7) a standard deviation. At the same time, the effect of *FDI_ADV_after* is slightly higher, which confirms our hypothesis: firms targeted by foreign investors coming from countries with better managerial capabilities enjoy a benefit compared to those acquired by entities coming from developing countries, even though the premium appears to be small in magnitude. This might depend on the fact that there is self-selection in the sample of firms that decide to acquire a company abroad, i.e. only the most productive firms engage in foreign acquisitions so that also investors coming from emerging economies show better management standards than the Italian ones. Finally, interestingly, the effect of *DOM_after* is negative and significant. If anything, acquisitions by domestic firms translate into worse managerial standards.

In order to include firm fixed effects without incurring in the incidental parameter problem, the analysis does not take into account the binary nature of *MQ* and that most of the firms have no valid ISO certificate, i.e. *Cert. Int.* is a count variable that includes zeros. However, the results are confirmed when we estimate Probit and Poisson models that directly address this issue (see Table A2). Furthermore, in this case, the effect of

FDI_after and *FDIADV_after* on *MQ* becomes significant.

Table 4: Panel regression results. Dependent variable: Management Quality.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) MQ	(6) MQ	(7) MQ	(8) MQ	(9) MQ
FDI_after	0.032*** (0.003)			0.003 (0.004)			-0.003 (0.006)		
DOM_after		0.030*** (0.002)			-0.001 (0.003)			-0.001 (0.004)	
FDIADV_after			0.033*** (0.004)			0.004 (0.004)			-0.003 (0.006)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No	Yes	Yes	Yes
Observations	31,730	31,730	31,730	26,895	26,895	26,895	17,907	17,907	17,907
R-squared	0.657	0.658	0.656	0.711	0.711	0.711	0.755	0.755	0.755

NOTES: Dependent variable takes value 1 if the firm has valid ISO 9000 certificates at time t. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

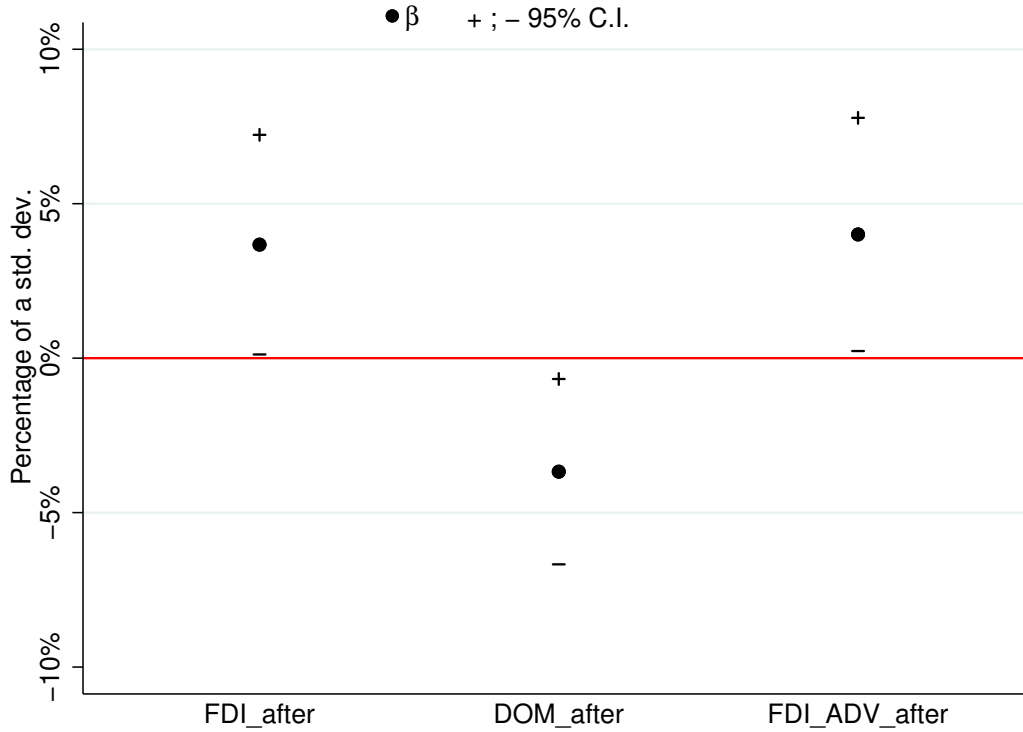
Table 5: Panel regression results. Dependent variable: Certificate intensity.

VARIABLES	(1) Cert. Int.	(2) Cert. Int.	(3) Cert. Int.	(4) Cert. Int.	(5) Cert. Int.	(6) Cert. Int.	(7) Cert. Int.	(8) Cert. Int.	(9) Cert. Int.
FDI_after	0.106*** (0.007)			0.035*** (0.008)			0.029** (0.012)		
DOM_after		0.070*** (0.004)			-0.017*** (0.005)			-0.020** (0.008)	
FDIADV_after			0.110*** (0.007)			0.039*** (0.008)			0.035*** (0.012)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No	Yes	Yes	Yes
Observations	31,730	31,730	31,730	26,895	26,895	26,895	17,907	17,907	17,907
R-squared	0.663	0.663	0.663	0.735	0.735	0.735	0.780	0.780	0.780

NOTES: Dependent variable is the number of valid ISO certificates of firm i at time t. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

The empirical evidence discussed above is consistent with the stylised facts presented in Section 3.4. Firms acquired by foreign investors ultimately experience an increase in productivity, while never-acquired firms and those targeted by a domestic acquirer show a decreasing pattern in productivity in the last decade. To further corroborate such results, we estimate the impacts of acquisitions on productivity. Figure 7 reports them in terms of the percentage of one standard deviation of productivity. They clearly point to the

Figure 7: Effect of FDI and domestic M&As on productivity (percentage of a standard deviation).



NOTES: Reported results come from a regression of the following form $Y_{i,t,s,r} = \alpha + \beta_1 X_{i,t,s,r} + \Gamma Controls_{i,t,s,r} + \delta_i + \lambda_t + \phi_{t,s} + \eta_{t,r} + \epsilon_{i,t,s,r}$, where the dependent variable is sales over employees and where X is alternatively FDI_after, DOM_after, and FDI_ADV_after. Γ includes intangibles assets (log), equity (log), markup, and ROE. δ_i are firm fixed effects, λ_t are year fixed effects, $\phi_{t,s}$ are year*sector fixed effects and $\eta_{t,r}$ are year*NUTS2 fixed effects. Standard errors are robust. In the figure, we express coefficients in terms of one standard deviation of the dependent variable.

beneficial effects brought about by foreign investors, in contrast to domestic ones. However, in this case, the premium associated with investors coming from advanced economies is marginal with respect to deals originating in developing countries. In any case, while firms targeted by a foreign investor enjoy an increase in productivity of about 5% one standard deviation after the acquisition, domestic operations translate into a decrease of similar magnitude in productivity.

Using firms targeted by a domestic investor as controls limits ex-ante selection and endogeneity. However, systematic differences between the two groups of firms may still bias our results. Hence, to further corroborate previous findings we follow [Wang and Wang](#)

(2015) and [Fons-Rosen et al. \(2021\)](#) and prune our sample using a PSM, that is, we match treated firms (acquired by a foreign investor and never subjected to a domestic deal) to ex ante similar domestically acquired firms (never invested in from abroad). We estimate a 1-to-1 PSM with replacement, and we also require exact matching at year, macro-area, and industry levels. As for regressors, we replicate [Fons-Rosen et al. \(2021\)](#)'s specification and include the second lags of the following variables: the log of productivity, log employment, log wage costs, log tangible assets to employment, log total assets, log firm age, the squares of log assets and log age, the growth of assets; and the dummy *MQ*. The latter is included in order to control for potential pre-existing trends (e.g. FDI firms targeting already certified firms). Overall, we match 538 FDI firms. The matching procedure further reduces systematic differences between the treated and control group and balancing properties are broadly satisfied. Indeed, for each variable included in the PSM, after the matching, we cannot reject the null hypothesis of no difference in the means between treated and control firms (Table A3). Furthermore, PSM reduces the standardised differences in the means of the covariates, which are now well below the [Normand et al. \(2001\)](#) and [Austin \(2009\)](#) threshold of 0.1 (Figure A1) and variances ratios do not pose any particular concern (Figure A2)⁵.

We then replicate our main Diff-in-Diff estimates in the pruned sample. The results are reported in Tables 6 and 7. Contrary to previous findings, now both *FDI_after* and *FDLADV_after* attract a positive and significant coefficient also when we estimate their effect on *MQ*. Foreign acquisitions increase the probability of obtaining an ISO 9000 management quality certificate. Again, if anything, firms acquired by a domestic investor experience a decrease in such probability. These findings are confirmed when we use *Cert. Int.* as the dependent variable. Firms targeted by a foreign investor experience an increase in their certification activity, contrary to those involved in domestic M&As. Coefficients are stable and not affected by the inclusion of year*region and year*sector fixed effects, nor by the introduction of additional firm-level controls in the specification and, again, only marginally higher for foreign investors coming from advanced economies with respect to

⁵The best balance is achieved when the variances ratio is equal to 1. [Rubin \(2001\)](#) considers acceptable a ratio between 0.5 and 2. Even if the PSM does not provide substantial and unambiguous gains, the ratio still is comfortably in such a band.

the overall *FDI_after* dummy.

Table 6: Panel regression on the matched sample. Dependent variable: Management Quality.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) MQ	(6) MQ	(7) MQ	(8) MQ	(9) MQ
FDI_after	0.033*** (0.004)			0.013** (0.006)			0.016** (0.008)		
DOM_after		0.033*** (0.005)			-0.008 (0.007)			-0.016* (0.009)	
FDI_ADV_after			0.034*** (0.004)			0.012* (0.007)			0.018** (0.008)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No	Yes	Yes	Yes
Observations	9,246	9,246	9,246	7,510	7,510	7,510	5,650	5,650	5,650
R-squared	0.674	0.673	0.674	0.751	0.751	0.751	0.781	0.781	0.781

NOTES: Dependent variable takes value 1 if the firm has a valid ISO 9000 certificate at time t. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

Table 7: Panel regression results on the matched sample. Dependent variable: Certificate intensity.

VARIABLES	(1) Cert. Int.	(2) Cert. Int.	(3) Cert. Int.	(4) Cert. Int.	(5) Cert. Int.	(6) Cert. Int.	(7) Cert. Int.	(8) Cert. Int.	(9) Cert. Int.
FDI_after	0.121*** (0.009)			0.027** (0.011)			0.027* (0.015)		
DOM_after		0.090*** (0.009)			-0.013 (0.012)			-0.007 (0.017)	
FDI_ADV_after			0.122*** (0.009)			0.026** (0.011)			0.031** (0.015)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No	Yes	Yes	Yes
Observations	9,246	9,246	9,246	7,510	7,510	7,510	5,650	5,650	5,650
R-squared	0.671	0.665	0.671	0.775	0.775	0.775	0.808	0.808	0.808

NOTES: Dependent variable is the number of valid ISO certificates of firm i at time t. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

5 Sensitivity analysis

In this section, we test the robustness of our results by changing the relevant control group.

First, we replicate the estimation carried out in the previous section on a sample consisting

of FDI firms and never acquired matched firms. Second, we consider as a control group a set of firms that were rumoured to be targeted by a foreign investor in the sample under scrutiny, but were not ultimately acquired.

5.1 Matching foreign acquired and never acquired firms

In order to limit ex-ante selection, the main analysis presented in the previous section compares firms acquired by a foreign investor with those subject to a domestic deal. However, the traditional way of dealing with ex-ante selection in the FDI literature is to match firms acquired by a foreign investor with similar firms that have never been involved in M&As (see for instance [Arnold and Javorcik \(2009\)](#), [Stiebale \(2016\)](#) and [Bencivelli and Pisicoli \(2022\)](#)). In this section, we follow this strategy and estimate a 1-to-1 PSM with replacement that matches FDI firms with similar firms that have never been targeted neither by a foreign nor by a domestic investor from 2010 to 2020. Of course, as in the main analysis, firms that were acquired by a foreign investor before 2010 are excluded from the sample. The PSM specification follows that applied in the previous exercises (Table 6 and 7) and includes the second lags of the following variables: the log of productivity, log employment, log wage costs, log tangible assets to employment, log total assets, log firm age, the squares of log assets and log age, the growth of assets; and the dummy MQ as regressors. We also require exact matching at year, macro-area, and industry level. Overall, 559 firms targeted by a foreign acquirer are matched with ex-ante similar never acquired firms. The results of the PSM and the balancing properties are reported in the Appendix (Table A4, Figure A3 and A4). Matching is capable of significantly shrinking the differences between the treated and control firms. Before the procedure, the means of all variables systematically differ between treated and untreated firms. Moreover, for six variables, the variance ratio is significantly different from 1. The sample produced by the PSM, on the other hand, is much more balanced. Only the average age of the firms is still significantly different between the treated and control units, and we fail to reject the null of a variance ratio equal to 1 for each covariate of the PSM. Moreover, absolute standardised mean differences are considerably higher than the 0.1 ([Austin, 2009](#)) and 0.25 ([Rubin, 2001](#)) thresholds in the unbalanced sample, while this is not the case after matching. In sum, the effectiveness

of PSM in reducing systematic differences seems very satisfying.

We then replicate the same specifications on the effect of *FDI_after* and *FDI_ADV_after* on the probability of receiving a management certificate (Table 8) and on the total number of ISO certificates obtained by the firm (Table 9). Both tables confirm our previous findings: firms targeted by a foreign investor experience an improvement in management quality, both in terms of *MQ* and *Cert. Int.*. This beneficial effect appears regardless of the country of origin of the FDI since the coefficients associated with *FDI_ADV_after* are only slightly higher than those of *FDI_after*.

Table 8: Panel regression on FDI and never acquired matched sample. Dependent variable: Management Quality.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) MQ	(6) MQ
FDI_after	0.034*** (0.004)		0.026*** (0.006)		0.031*** (0.008)	
FDI_ADV_after		0.035*** (0.004)		0.026*** (0.006)		0.032*** (0.008)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	Yes
Observations	11,814	11,814	9,590	9,590	7,716	7,716
R-squared	0.695	0.695	0.764	0.764	0.787	0.787

NOTES: Dependent variable takes value 1 if the firm has a valid ISO 9000 certificates at time *t*. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5.2 Completed vs failed foreign deals

In this section, we compare the certification activity of firms acquired by a foreign investor with that of firms that were rumoured to be targeted by an FDI but were ultimately not acquired. Zephyr by BVD, indeed, not only provides information on completed operations, but it also reports detailed data on rumoured deals. By imposing the same selection strategy applied to completed deals (i.e. 10% threshold, exclusion of targets in the financial sector and of already foreign firms, etc.), we end up with 158 failed deals.

Table 9: Panel regression on FDI and never acquired matched sample. Dependent variable: Certificate intensity.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Cert. Int.	Cert. Int.	Cert. Int.	Cert. Int.	Cert. Int.	Cert. Int.
FDI_after	0.119*** (0.009)		0.032*** (0.012)		0.046*** (0.015)	
FDI_ADV_after		0.120*** (0.009)		0.043*** (0.012)		0.062*** (0.015)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	Yes
Observations	11,814	11,814	9,590	9,590	7,716	7,716
R-squared	0.668	0.668	0.781	0.781	0.809	0.810

NOTES: Dependent variable is the number of valid ISO certificates of firm i at time t . Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

We believe that using such a control group eliminates the ex-ante selection affecting the sample of FDI firms. Indeed, the same observable and unobservable firm-level factors of target entities attracting a foreign investor should also characterise such firms. If a foreign investor was rumoured to be interested in acquiring them, even though the operation was not completed, such firms should be comparable to firms eventually receiving the FDI. Deals may fail for a number of reasons, and one may argue that the foreign investor, after a deeper investigation of firm fundamentals, may decide to give up. However, first, we still would be able to limit ex-ante selection on unobservables, the most difficult component to control for; second, Table A5 confirms that FDI-firms, even if still differ on a number of dimensions, are much more similar to rumoured targets than when we compare them with the universe of Italian firms. In particular, even if they are still slightly smaller and younger, and more profitable, by comparing this set of firms we virtually eliminate any ex-ante difference in terms of productivity, tangibility, liquidity, growth perspectives, and, importantly, management quality. Moreover, as discussed above, we are able to control for selection on unobservable characteristics that lead FDI to target specific firms.

Hence, we replicate our main analysis and present the results in Tables 10 and 11. Again, the most problematic estimates are those using MQ as the dependent variable. The coefficients of both FDI_after and FDI_ADV_after are positive and strongly significant

when only firm fixed effects are included (columns 1 and 2 of Table 10). In columns 3 and 4 they turn marginally insignificant, with p-values of 0.133 and 0.162, respectively. Finally, the two dummies show no significant explanatory power when additional firm-level controls are included in the specification.

Table 10: Panel regression on completed and failed FDI sample. Dependent variable: Management Quality.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) MQ	(6) MQ
FDI_after	0.035*** (0.004)		0.008 (0.005)		0.004 (0.007)	
FDI_ADV_after		0.036*** (0.004)		0.007 (0.005)		0.003 (0.007)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	Yes
Observations	12,885	12,885	9,980	9,980	7,100	7,100
R-squared	0.697	0.697	0.756	0.756	0.788	0.788

NOTES: Dependent variable takes value 1 if the firm has a valid ISO 9000 certificate at time t. Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.10

On the other hand, results clearly point to a positive role of foreign investors on management quality when the total number of certifications is used as dependent (Table 11). Firms acquired by a foreign investor experience an increase in *Cert. Int.* following the acquisition with respect to firms that, although targeted by an FDI, were eventually not acquired. Again, deals originating in an advanced economy do not show any particular premium.

Table 11: Panel regression on completed and failed FDI sample. Dependent variable: Certificate intensity.

VARIABLES	(1) Cert. Int.	(2) Cert. Int.	(3) Cert. Int.	(4) Cert. Int.	(5) Cert. Int.	(6) Cert. Int.
FDI_after	0.118*** (0.007)		0.035*** (0.010)		0.028** (0.014)	
FDI_ADV_after		0.119*** (0.008)		0.032*** (0.010)		0.027* (0.015)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year*NUTS2 FE	No	No	Yes	Yes	Yes	Yes
Year*Sector FE	No	No	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	Yes
Observations	12,885	12,885	9,980	9,980	7,100	7,100
R-squared	0.683	0.682	0.752	0.752	0.794	0.794

NOTES: Dependent variable is the number of valid ISO certificates of firm i at time t . Additional controls: intangibles assets (log), equity (log), markup, ROE. Sectors are 4-digits Nace rev. 2 sectors, while NUTS2 are Italian regions. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

6 Conclusions

Most of the literature on FDI has long recognised the positive contribution of foreign acquisitions on target firms' performance and growth. Acquisitions by foreign entities have traditionally been associated with benefits in terms of innovation activity (Guadalupe et al., 2012), R&D (Stiebale, 2016), productivity and profitability (Braguinsky et al., 2015; Bircan, 2019) of the acquired firm. Although many studies seem to agree that the main mechanism justifying such findings is related to improved management practises brought about by the foreign investor, evidence on the matter is scarce and mostly anecdotal. In fact, directly testing this channel is difficult because defining and measuring management quality is a problematic task and firm-level data are generally not extensively available.

In this paper, we contribute to this literature by analysing a country, Italy, that has experienced a severe slowdown in productivity in the last decades. Other contributions (Schivardi and Schmitz, 2020) have shown that the poor performance of domestic firms can be ascribed to their inability to take advantage of the Information and Communication revolution. Due to their structural characteristics, Italian companies show an ineffective adoption of new technologies and this is detrimental to their productivity and growth. Schivardi and Schmitz (2020) document how this is mainly dependent on the poor level of management in the country. Our idea is that if the cultural and structural factors of domestic firms have determined the poor performance of the economy, investors from more thriving contexts should be able to increase their growth prospects by improving management practices.

To answer this research question, we combine granular administrative data on active ISO certifications by firms with information on cross-border and domestic M&As occurring in Italy between 2010 and 2020. While other studies on management practices rely on survey data, our approach allows us to consider the management quality of the universe of Italian firms. We proxy management quality with two variables. First, we focus on the ISO 9000 family of standards that directly certify the quality of management at the firm level, measuring seven pillars (Customer Focus, Leadership Importance of Top Management, Engagement of People, Process Approach, Improvement, Evidence-based decision-making, and Relationship Management) in candidate firms. Second, we also consider the total

number of active ISO certificates at the firm level as a proxy for management quality.

To deal with the *ex-ante* selection affecting our sample, in the main analysis we compare the certification activity of firms acquired by a foreign investor with that of firms involved in a domestic M&As. Comparing foreign-acquired with domestically-acquired firms is a growing strategy in the literature, since it is better able to identify a causal effect than previous approaches, i.e. matching FDI firms with not-acquired controls (Fons-Rosen et al., 2021). We first use targets of domestic M&As as a “natural” control group, then move to a PSM + Diff-in-Diff setting. Our findings point to a positive contribution of FDI to the management quality of target firms, which also results in increased productivity. On the other hand, if anything, firms acquired by a domestic investor experience deterioration in their management standards. We document no outstanding premium deriving from deals originating in advanced economies.

The results are confirmed when we match FDI firms with never acquired ones, the traditional approach in the literature, and when we compare the management quality of FDI targeted companies with that of firms involved in failed deals. They show that the beneficial effects of FDI on target firms’ performance found by most of the literature may be traced to improved management practices brought about by foreign shareholders, regardless of their country of origin.

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Appendix A.

Table A1: List of ISO and other certificates from [Accredia \(2023\)](#).

UNI/PdR 42:2018	<i>Prevention and contrast to bullying</i>
ISO 13485	<i>Medical devices – Quality management systems – Requirements for regulatory purposes</i>
UNI EN 9100	<i>Quality management systems - Requirements for aviation, space and defense</i>
ISO 3834	<i>Quality requirements for fusion welding of metallic materials</i>
ISO 9001	<i>Quality management systems — Requirements</i>
ISO 29990	<i>Learning services for non-formal education and training – Basic requirements for service providers</i>
ISO 20121	<i>Event sustainability management systems</i>
ISO 39001	<i>Road traffic safety (RTS) management systems</i>
ISO 22301	<i>Security and resilience – Business continuity management systems</i>
ISO 28000	<i>Security and resilience – Business continuity management systems (supply chains)</i>
ISO 55001	<i>Asset management – Management systems</i>
CRMS FP 07:2015	<i>Credit risk management</i>
ISO 37001	<i>Anti-bribery management systems</i>
ISO 21001	<i>Educational Organization Management Systems</i>
UNI/PdR 33:2017	<i>Law firms</i>
UNI/PdR 74:2019	<i>Construction- Building Information Modeling</i>
ISO 29001	<i>Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems</i>
ISO 22000	<i>Food safety management systems — Requirements for any organization in the food chain</i>
FAMI QS	<i>Specialty Feed Ingredients quality</i>
ISO 19443	<i>Enterprise integration—Framework for enterprise modelling</i>
ISO 13485	<i>Medical devices – Quality management systems</i>
ISO 37301	<i>Governance, risk management, and compliance</i>
UNI/PdR 125:2022	<i>Gender equality in organizations</i>
ISO 14001	<i>Environmental management system</i>
ISO 50001	<i>Energy management systems</i>
ISO 45001	<i>standard for management systems of occupational health and safety</i>
ISO/IEC 27017	<i>security standard developed for cloud service providers</i>
ISO/IEC 27018	<i>Cloud privacy</i>
ISO/IEC 27001	<i>Information security standards</i>
ISO/IEC 20000	<i>IT service management</i>

Table A2: Probit and Poisson estimation. See Tables 4 and 5 for comparison.

VARIABLES	(1) MQ	(2) MQ	(3) MQ	(4) MQ	(5) Cert. Int.	(6) Cert. Int.	(7) Cert. Int.	(8) Cert. Int.
FDI _{after}	0.091** (0.042)		0.094** (0.046)		0.446*** (0.077)		0.332*** (0.074)	
FDI _{ADV_after}		0.081* (0.044)		0.080* (0.048)		0.439*** (0.079)		0.319*** (0.076)
Estimation	Probit	Probit	Probit	Probit	Poisson	Poisson	Poisson	Poisson
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NUTS2 FE	Yes	Yes	No	No	Yes	Yes	No	No
Sector FE	Yes	Yes	No	No	Yes	Yes	No	No
Additional controls	No	No	Yes	Yes	No	No	Yes	Yes
Observations	27,130	27,130	19,775	19,775	28,133	28,133	19,775	19,775
Pseudo R-squared	0.055	0.055	0.047	0.047	0.091	0.091	0.097	0.097

NOTES: Dependent variable on top row. MQ takes value 1 if the firm has a valid ISO 9000 certificate at time t. Cert. Int. is the number of active ISO certificates that firm i holds a time t. Additional controls: intangibles assets (log), equity (log), markup, ROE, joint stock firm (dummy). To avoid observation drops, sectors fixed effects in this table refer to Nace rev. 2 sections fixed effects. Pseudo R-squared is the McFadden Pseudo R-squared. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05

Table A3: PSM balancing properties. FDI vs. domestic acquisitions.

Variable	Unbalanced sample				Balanced sample			
	Treated (means)	Untreated (means)	t-test (means)	Var. ratio F-test (Ho: r!=1)	Treated (means)	Untreated (means)	t-test (means)	Var. ratio F-test (Ho: r!=1)
Productivity (ln, lag2)	5.295	4.967	***		5.309	5.293		
Employment (ln, lag2)	3.471	3.025	***		3.499	3.423		*
Wage costs (ln, lag2)	6.857	6.090	***		6.878	6.791		*
Tang. Ass/Empl (ln, lag2)	3.033	2.827	*		3.008	2.916		
Assets (ln, lag2)	9.257	8.615	***		9.259	9.169		
Assets ² (ln, lag2)	89.841	79.010	***		89.901	87.951		
Age (ln, lag2)	2.618	2.521	**		2.614	2.632		
Age ² (ln, lag2)	7.629	7.281			7.611	7.707		
Assets growth (lag2)	0.143	0.159			0.143	0.151		
MQ	0.068	0.047	*	***	0.069	0.059		*

NOTES: For each variable included in the PSM the Table reports its mean for treated and untreated firms before and after the PSM. The t-test provides the statistical significance of the difference in the means for the two groups of firms (treated and untreated, before and after the PSM). The Var. ratio F-test is a test on the ratio of the variances of the two groups (treated and untreated, before and after the PSM). It tests whether the ratio is significantly different from 1. *** p<0.01, ** p<0.05, *p<0.1.

Table A4: PSM balancing properties. FDI vs. never acquired firms.

Variable	Unbalanced sample				Balanced sample			
	Treated (means)	Untreated (means)	t-test (means)	Var. ratio F-test (Ho: $r \neq 1$)	Treated (means)	Untreated (means)	t-test (means)	Var. ratio F-test (Ho: $r \neq 1$)
Productivity (ln, lag2)	5.560	3.937	***		5.560	5.483		
Employment (ln, lag2)	3.207	1.446	***	***	3.207	3.286		
Wage costs (ln, lag2)	6.857	3.023	***	**	6.857	6.983		
Tang. Ass/Empl (ln, lag2)	3.283	2.251	***		3.283	3.426		
Assets (ln, lag2)	9.257	5.930	***	***	9.257	9.297		
Assets ² (ln, lag2)	89.841	38.502	***	***	89.841	90.767		
Age (ln, lag2)	2.618	2.289	***		2.618	2.735	**	
Age ² (ln, lag2)	7.629	6.001	***	***	7.629	8.296	**	
Assets growth (lag2)	0.143	0.058	***		0.143	0.106		
MQ	0.068	0.019	***	***	0.068	0.066		

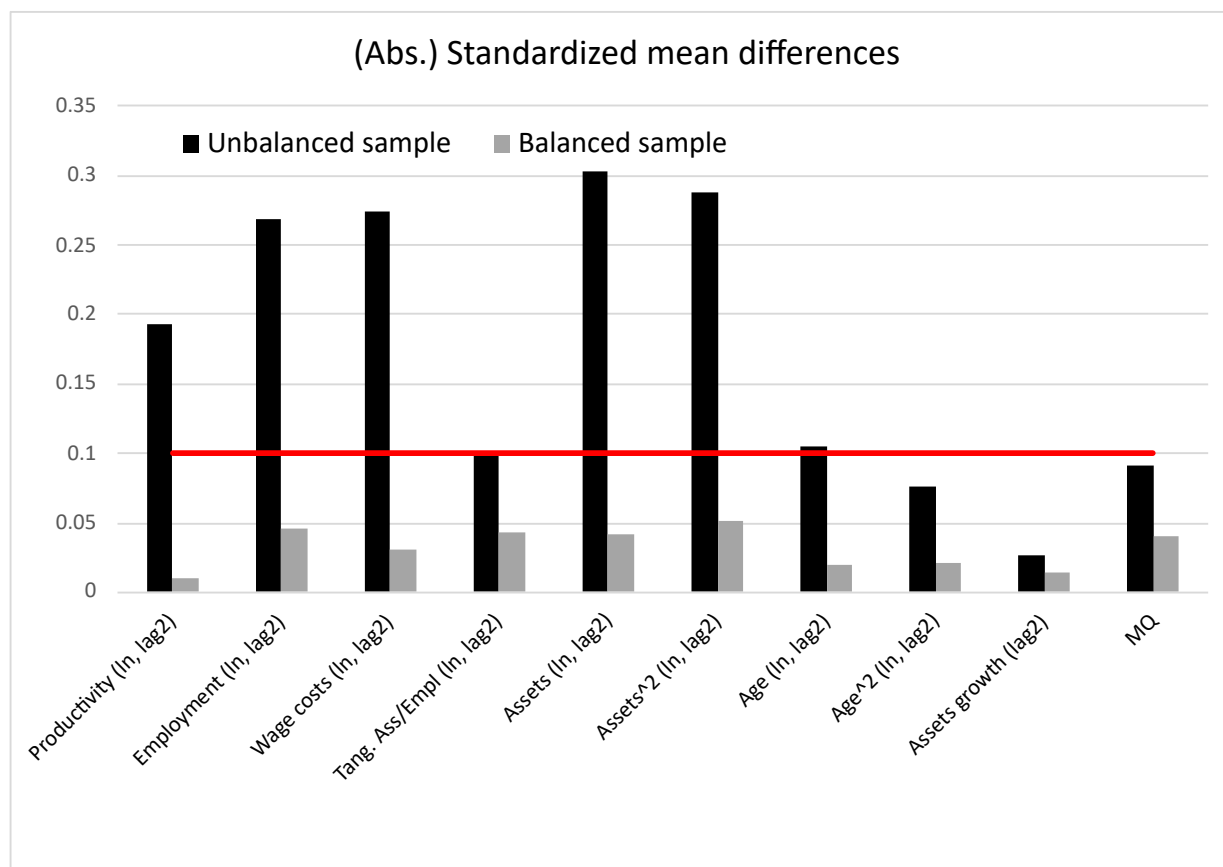
NOTES: For each variable included in the PSM the Table reports its mean for treated and untreated firms before and after the PSM. The t-test provides the statistical significance of the difference in the means for the two groups of firms (treated and untreated, before and after the PSM). The Var. ratio F-test is a test on the ratio of the variances of the two groups (treated and untreated, before and after the PSM). It tests whether the ratio is significantly different from 1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5: Comparison of Failed FDI (in the year of the rumour) with Completed deals (in the year of the acquisition). Means.

Variable	Failed FDI	t-test (H0: equal mean with completed deals)
Productivity (ln)	5.208	
Employment (ln)	4.218	***
Wage costs (ln)	8.252	***
Tang. Ass/Empl (ln)	3.149	
Assets (ln)	10.704	***
Net income	2743	
ROE	-1.737	*
Age (ln)	2.757	**
Cash/Assets	0.001	
Assets growth (%)	0.205	
Cert. Int.	0.146	
MQ	0.044	

NOTES: *** p<0.01, ** p<0.05, * p<0.10

Figure A1: Standardized differences in means (modulo) between treated and untreated in the unbalanced and balanced sample. FDI vs. domestic acquisitions.



NOTES: For each variable included in the PSM specification the Figure above reports the standardized difference in means between the treated and control firm, before and after the PSM, in modulo. The red line indicates the 0.1 thresholds. According to [Normand et al. \(2001\)](#) and [Austin \(2009\)](#) the absolute standardized mean difference should not exceed such a threshold for good variable balance. Other authors ([Rubin, 2001](#)) consider a threshold of 0.25.

Figure A2: Variances ratio (untreated/treated) in unbalanced and balanced sample. FDI vs domestic acquisitions.

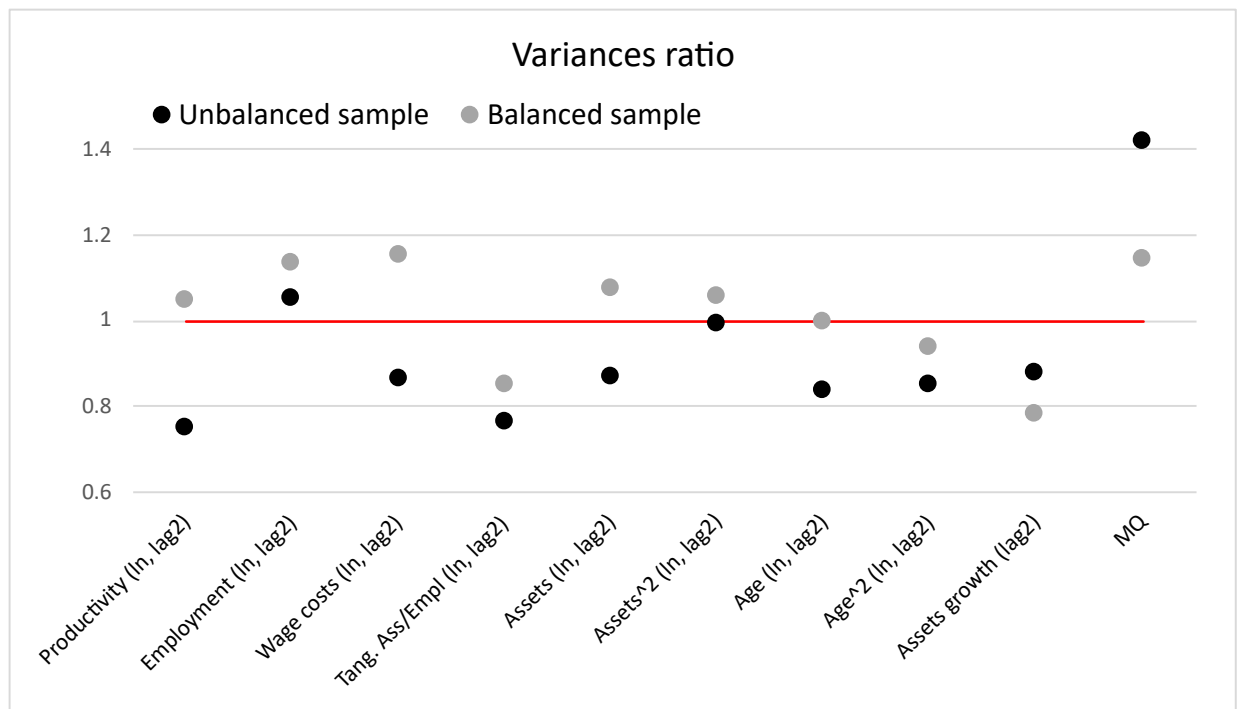
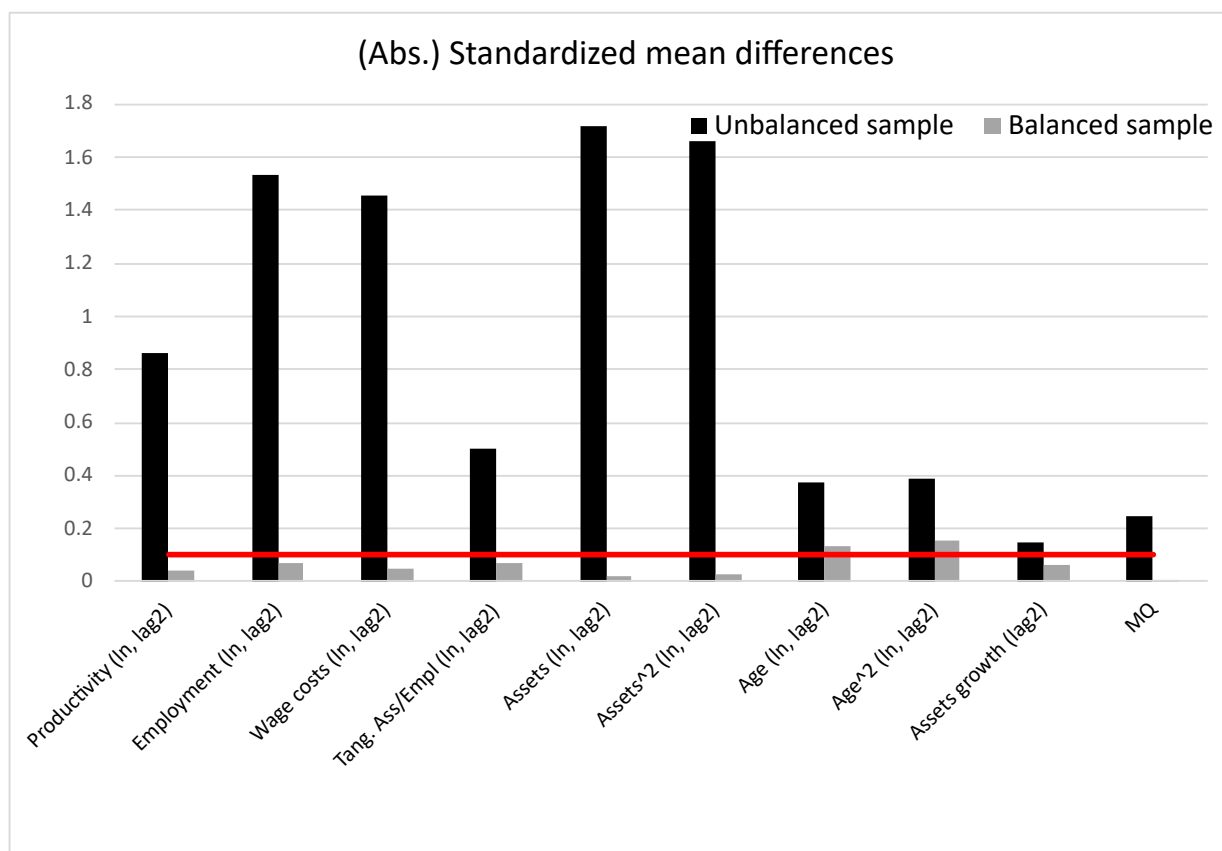


Figure A3: Standardized differences in means (modulo) between treated and untreated in the unbalanced and balanced sample. FDI vs. never acquired firms.



NOTES: For each variable included in the PSM specification the Figure above reports the standardized difference in means between treated and control firm, before and after the PSM, in modulo. The red line indicates the 0.1 thresholds. According to [Normand et al. \(2001\)](#) and [Austin \(2009\)](#) the absolute standardized mean difference should not exceed such threshold for good variable balance. Other authors ([Rubin, 2001](#)) consider a threshold of 0.25.

Figure A4: Variances ratio (untreated/treated) in the unbalanced and balanced sample. FDI vs never acquired firms.

