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Abstract

It is well established in the literature that foreign affiliates are subject to a series of governance and assimilation costs that deteriorate their performance. This is particularly relevant for firms which have been recently acquired by foreign investors. We employ the variation in civic capital across Italian provinces as an exogenous determinant of these governance costs. We derive the testable implication that there should be a clean evidence of a negative effect of foreign ownership on performance in areas where civic capital is low. As the level of local civic capital increases, this reduces the scope for internal transaction costs, and makes the governance of foreign affiliates easier, and their performance better. We take this prediction to the data and find confirmation of our conceptual framework. Our analysis underlines the importance of the geographic heterogeneity of informal institutions when analyzing the effect of foreign ownership on firm performance.

JEL Classification: F21, F23, D21, D23, R30, Z13

Keywords: Performance of foreign owned firms, Social capital, Productivity, Foreign direct investment.

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1 Introduction

The question of whether affiliates of multinational companies outperform purely domestic firms has attracted huge attention. The internalization literature (Dunning, 1981; Caves, 1996) stresses that multinational firms possess sophisticated assets which domestic firms lack, including managerial expertise, process and production technologies or brand names. Since these assets are transferred to the foreign affiliates, it is quite obvious to expect that foreign firms should perform better than their domestic competitors. On the other hand, there exists a well-developed management literature (Tomassen & Benito, 2009; Buckley & Strange, 2011; Filatotchev & Wright, 2011) which stresses the role of assimilation and governance costs that multinational enterprises (MNEs) incur when they operate a subsidiary in a foreign country. According to this literature, these internal transaction costs are a serious obstacle for the well-functioning of foreign affiliates.

The final performance of foreign affiliates can be seen as the outcome of these two contrasting forces. The first postulates an advantage of foreign firms with respect to domestic competitors coming from the assets internalized within the network of the MNE, while the second posits a disadvantage due to the higher exposure to governance and assimilation costs. Despite a large number of studies, the empirical literature has failed to reach a consensus on whether foreign firms do perform better than domestic ones. Especially more recent papers have cast doubts on the view that foreign ownership improves performance, in the year of the foreign acquisition or up to few years later. Papers like Harris & Robinson (2002), Benfratello & Sembenelli (2006), Salis (2008) show that, in general, there is not any significant increase in terms of performance induced by a foreign acquisition.

In this paper, we introduce a new dimension into this discussion. In particular, we allow for geographic heterogeneity in the effect of foreign ownership on performance: employing Italian firm level data, we show that there is a strong evidence of a negative effect of foreign ownership on firm performance in local areas where the stock of civic capital is low. On the contrary, as the stock of civic capital increases, so does the performance of foreign affiliates. The economic intuition behind this result is that, by reducing the scope of opportunistic behavior, civic capital alleviates agency problems and enhances cooperation in intra-firm interactions. Hence, we expect that where civic capital is low the disadvantages of foreign ownership in the form of governance and assimilation costs outperform the advantages. As civic capital goes up, governing and assimilating foreign firms become easier, something which, ultimately, improves their performance.

Our estimation strategy rests on a two stage approach. In the first stage we estimate total factor productivity by the semi-parametric approach proposed by Levinsohn & Petrin (2003). In the second stage, we employ a difference-in-difference approach where the change in firm productivity is regressed, among others, on our variable of interest, namely the interaction between a dummy identifying the change in foreign ownership status and the stock of local civic capital. By estimating the regression in first differences we explicitly take unobserved heterogeneity at the firm level into account. In addition, the difference-in-differences approach entails that econometric identification is based on the subset of firms switching ownership status, while the rest of firms who do not change their status form the baseline group. We also allow for industry, province, and time specific trends.

Focusing on Italy is particularly convenient for our exercise, as the intense investigation of civic capital in this country (Banfield, 1958; Putnam et al., 1993; Guiso et al., 2004) has produced a range of indirect

measures of civic capital. Specifically, as in Guiso et al. (2004), we proxy civic capital by electoral turnout in referenda, the number of blood donations, and the number of volunteers in non-profit organizations per province. In order to minimize problems of measurement error, we also extract the first principal component out of these three measures.

Our findings complement the existing literature along several lines. First, we extend the branch of studies which has looked at performance differentials between domestic firms and foreign affiliates. This question has been analyzed with data from different countries, including the U.K. (Griffith, 1999; Conyon et al., 2002; Harris & Robinson, 2002), Italy (Benfratello & Sembenelli, 2006), Germany (Temouri et al., 2008) , Slovenia (Salis, 2008), and Indonesia (Arnold & Javorcik, 2009). Each of these studies implicitly assumes that the governance costs that foreign affiliates face do not vary geographically. In contrast, our study underlines the importance of local informal institutions, in particular the stock of civic capital, and shows that an adverse effect of foreign acquisitions on performance can be found in some selected areas only.

Second, the international business literature recently has stressed the role of governance costs in determining the performance of foreign firms. Analyzing the performance of foreign subsidiaries owned by Norwegian multinationals, Tomassen & Benito (2009) find that governance costs (which are, according to their definition, costs related to bargaining, monitoring and maladaptation) significantly reduce the performance. Their paper differs from ours because they use a questionnaire from 160 foreign affiliates belonging to Norwegian parent companies, and because the basic variables are multi-item variables based on a qualitative assessment by the respondent.[1] Moreover, differently from them, we stress the role of the "civic environment" in which the affiliate is embedded for the determination of its governance costs and, ultimately, performance. In other terms, we do not measure directly each affiliate's governance costs, but we provide evidence that (through civic capital) an attitude towards greater information sharing, more cooperative behavior, and easier conflict resolution improves affiliates performance.

Two general caveats can be made regarding our analysis. The first point regards the mode of entry of the MNE. Foreign firms have the option of entering a foreign market through a greenfield investment, when a new production plant is built, or through a brownfield one, when a certain amount of equities of an existing plant is acquired.[2] This paper and much of the literature on the impact of foreign ownership are focused on the case of brownfield acquisitions, since in this case it is easier to identify the direct effect of the ownership change on firms performance. The second important point to keep in mind is that the literature on foreign firms performance often looks at the impact of the ownership change in the short run. Some papers (Conyon et al., 2002; Benfratello & Sembenelli, 2006) analyze the effect of foreign ownership on productivity in the same year the change in ownership status takes place. Other papers (Harris & Robinson, 2002; Salis, 2008) follow the firm up to few years after the acquisition. In this respect, our paper is not an exception, because, as it will be discussed below, we look at productivity changes over a three-year period of time. Consequently, we agree with Harris & Robinson (2003) that over a longer time horizon the performance of foreign firms may be significantly better than that of domestic firms, because it may take time to fully exploit the advantages of foreign ownership.

[1] See Tomassen & Benito (2009) for more information.

[2] The usual convention is to identify a foreign direct investment when foreign persons come to hold at least 10% of the share of equities.

The rest of the paper is structured as follows. In section 2, we first review the literature about the performance of foreign firms, and then outline the mechanism by which civic capital impacts on this. Section 3 presents the data, section 4 the methodological approach, section 5 the results, while section 6 discusses the robustness of the analysis. Finally, section 7 concludes.

2 Civic capital and the performance of foreign firms: assessing the link

2.1 The impact of foreign ownership on performance

Several studies have addressed the issue relative to the productivity difference between foreign and domestic firms.[3] The main theoretical underpinning lies in the so-called internalization theory (Dunning, 1981; Caves, 1996), according to which foreign affiliates established in host countries receive superior intangible assets coming from the parent company, usually in the form of technological and managerial know-how, and brand names. This leads to a significant rise in the productivity of the receiving firms, besides allowing the MNE to expand production abroad avoiding the market transaction costs implied by the transfer of the goods through trade or other arrangements such as franchising or international joint ventures. Nevertheless, this expected raise in productivity is not automatic as subsidiaries may also incur in productivity losses. This may depend on a series of issues.

In their review of the literature, Harris & Robinson (2003) mention several reasons why foreign firms may actually experience a decline in performance, particularly in the immediate post- acquisition period. First, due to cultural differences between home and host countries, the process of incorporation and assimilation of acquired plants into the MNE structure may result problematic, and it may be particularly difficult to reach from the beginning a high level of efficiency.[4] The change in ownership due to the foreign acquisition may actually exacerbate governance and organizational problems (e.g., failures in coordination and monitoring) that are quite common in business enterprises. Tomassen & Benito (2009) use data from a survey of 160 Norwegian MNEs. They find a performance decline in foreign subsidiaries and indicate that nearly 40% of their variability in terms of performance can be attributed to governance costs.

Second, a lower level of productivity may be caused by the different types of activity that are carried out in the foreign owned plant. As a matter of fact, parent firms may be willing to keep close to the headquarters high valued added operations, while letting the delocalization in the host country of low value added operations, such as assembly. This could potentially decrease productivity in affiliates abroad due to the increase in the use of low-skilled labor and low-end technologies.

Another reason for the absence of a sizeable increase in the performance of foreign firms is the one

[3]The literature on this topic is really vast. We have been selective and review here only the research work that we judge to be more closely related to our research.

[4]See on this issue Dunning (1998) too. There is also a large literature on the role of cultural distance in M&A, but we do not review it here. Moreover, since our paper is focused on a developed country like Italy, we think it is of little interest a comparison of our paper with Arnold & Javorcik (2009), who analyze data pertaining to a developing country like Indonesia. The authors find that foreign ownership leads to productivity improvements being particularly visible after three years of the acquisition.

proposed by Salis (2008). He finds that acquired Slovenian firms in 1997 and in the two subsequent years do not overcome in terms of productivity their domestic counterparts. He motivates his finding of a non-significant effect of foreign ownership hanging on the fact that the acquisition carried out by the investing firm may be characterized by an asset seeking motivation: in this situation, MNEs make a foreign direct investment (FDI) with the purpose of having access to technological or other assets held by the acquired firm. For this reason, it is possible that the firm receiving the FDI has nothing to benefit from the change in ownership, since it enjoys the same (or even greater) productivity level of the parent company.

Numerous studies have analyzed the impact of foreign ownership on firm performance. This huge academic interest notwithstanding, empirical evidence remains mixed. Conyon et al. (2002) document for the U.K. an increase in the level and growth of labor productivity when a foreign acquisition takes place. This result contrasts sharply with Harris & Robinson (2002), still for the case of the U.K. They find that firm performance, after a domestic or foreign acquisition, may actually deteriorate. Consistently with this picture, Benfratello & Sembenelli (2006) get a negative point estimate for the effect of foreign ownership on productivity in Italy, although the parameter is statistically different from zero at the 10% level in one specification only, while in the rest of the specifications it is not statistically different from zero.[5]

Out of the main reasons that may explain the short run performance of foreign firms, we focus conceptually on the role of governance and organizational difficulties that arise when firms are foreign owned. These problems are ubiquitous to every business organization, but become particulary severe when a firm is assimilated in the network of an MNE. We see the foreign firm performance score to be determined by the balance between the advantages of being part of the MNE network, as postulated by the internalization theory, and the disadvantages, as postulated by the governance and internal transaction costs theory. The novel point that our paper makes is to show that this process may be facilitated or hindered by the level of civic capital of the local area where the firm is located. We now turn to developing this argument properly.

2.2 Foreign firms, governance costs and civic capital

The internalization theory of FDI posits that MNEs opt to expand abroad through foreign acquisitions whenever market agreements with foreign producers are too costly or too risky.[6] However, in doing so, MNEs incur another type of transaction costs, this time specific to the relationship between the parent company and the foreign affiliate. The business literature has stressed the role of three interrelated determinants of transaction costs within large organizations in general, and multinational firms in particular (Buckley & Carter, 1996; Buckley & Casson, 1998; Buckley & Strange, 2011). The first concerns information and knowledge. The relevant information for decision making is distributed among individuals within a firm. Firm organization has to be designed in such a way as to facilitate a smooth flow of information and knowledge among its members both within and across hierarchies. Second, the tasks required for production have to be efficiently coordinated. This requires identification of complementarity of action and

[5] A positive significant effect is found when they account for the nationality of the foreign investor. In the case of firms which become owned by a U.S. company, a surge in productivity is associated to the ownership change.

[6] For example, imperfect property rights protection in the foreign country could lead to profits' loss due to the imitation of the products. In addition, market relationships between the MNE and foreign producers may suffer from a wide range of imperfections due to contractual incompleteness.

the corresponding coordination of the production process. Third, firm members often pursue personal goals which are not necessarily congruent with those of the firm as a whole. Therefore, a motivational scheme is necessary which ensures that agents take actions which are consistent with the objective function of the firm.

Importantly, the incidence of internal transaction costs is substantially higher in the case of multinational firms as compared to domestically owned firms. The increase stems from two interrelated sets of factors which affect each of the above mentioned areas. First, operation in different countries implies substantial spatial separation of production facilities. This requires a smooth flow of information and makes an efficient coordination of the various production tasks more cumbersome. Moreover, asymmetric information between local managers and foreign shareholders as well as the difficulty to effectively monitor distant agents exacerbate agency problems (Buckley & Casson, 1998). The second set of factors are cultural differences among countries. This increases and further complicates the flow of information and knowledge among foreign affiliates and the mother company (Hedlund & Nonaka, 1993; Buckley & Carter, 2002).

Civic capital, on the other hand, has important bearings on the incidence of intra-firm governance costs. Relying on Guiso et al. (2010), we define it as "those persistent values and beliefs that help a group overcome the free-rider problem in the pursuit of socially valuable activities".[7] The important characteristic that civic capital entails is the property of hampering narrow-minded self-interested behavior in collective endeavors. Reducing the scope of opportunistic behavior, in turn, is associated with a reduction in shirking in intra-firm relationships which reduces governance costs of intra-firm transactions through at least two channels. First, reduced shirking removes agency problems and mitigates dilemmas of collective action at the root. Second, the increased cooperative behavior of agents that is associated with a high stock of civic capital improves the flow of information and the coordination of tasks.

As outlined above, the spatial separation of production and the related lack of information about local conditions makes multinational firms more vulnerable to opportunistic exploitation in contractual relationships than domestically owned firms.

Consequently, the main testable hypothesis of our framework is that assimilation problems and the associated governance costs should be stronger where civic capital is low, and this implies that there should be a clean evidence of a (short run) negative effect of foreign ownership on performance in areas where civic capital is low. As the level of local civic capital increases, this reduces the scope for information, coordination, and monitoring hazards, and makes the governance of foreign affiliates easier, and their performance better.[8] Let us now describe the data set and the empirical strategy employed to test this hypothesis.

[7] See Guiso et al. (2010) on p. 7.

[8] It is important to stress that we deviate from some of the business literature in an important dimension. Several studies have shown that cooperation among firm members is determined by firm policies (Spagnolo, 1999; Rob & Zemsky, 2002). We abandon this assumption in that the cooperative attitude in a firm is exclusively determined by the stock of civic capital in the area where the firm is located. This assumption is backed by empirical evidence. Analyzing a data set from a large Italian bank, Ichino & Maggi (2000) show that the cooperative behavior of workers is to a large extent determined by individual background. Similarly, Weber et al. (1996) find that national and corporate culture are strongly correlated.

3 Data description

3.1 The UniCredit Survey

We work with the 7th (1995-1997), 8th (1998-2000), and 9th (2001-2003) wave of "*Indagine sulle imprese manifatturiere*" (the Survey of manufacturing firms). This survey was carried out by Mediocredito Centrale, now a part of UniCredit Group, one of the largest Italian banks.[9] Each wave covers three years. Overall, the period that we consider ranges from 1995 until 2003. The data set encompasses the universe of Italian manufacturing firms with more than 500 employees, as well as a stratified and rotating sample of smaller firms. Half of the firms are replaced by new firms in subsequent waves. The choice of the firms to be dropped is random and tries to maintain the structure of stratification. The minimum size of firms in the three waves are 10 employees. In the survey, firms are asked to provide detailed information about their ownership structure, labor force, R&D activity, internationalization and finance. The information from the survey is then combined with yearly balance sheet data from AIDA, enabling us to work with a rich firm-level data set.[10]

In the survey, firms are asked to report their ownership structure just once in each wave, with reference to the last year of the wave. For this reason, in the final sample we keep only observations from the years 1997, 2000, and 2003 (the last years of each wave) so that the full set of information is available. Moreover, in order to allow the implementation of panel techniques with an adequate number of observations, we keep only firms which are surveyed in two consecutive waves at least. Concerning the definition of a foreign affiliate, we stick to the standard definition whereby a firm is classified as foreign owned if at least 10% of the equities is held by one or more foreign persons. Consequently, firms can experience the following two changes in ownership status over time: they can start being foreign owned when the equities held by foreigners reach at least the 10% threshold (we call this a *start* event); they can stop being foreign owned, thus becoming domestically owned, when the amount of equities held by foreigners goes below the 10% threshold (we call this a *stop* event). Given that firms are surveyed for a maximum of three waves, some of them may experience multiple changes in the foreign ownership status (from domestic to foreign and then back to domestic or, viceversa, from foreign to domestic and then again to foreign).[11] Some firms are always domestic over the observed lapse of time, while others are always foreign. In the part devoted to the description of the empirical strategy we will explain why it is advisable to rely exclusively on firms who change ownership status (firms who are hit by at least one start or stop event over time) to identify the impact of foreign ownership according to local civic capital.

After removing outliers we end up with an unbalanced panel of approximately 1600 firms.[12] Calculating first differences gives 1989 observations. As to the events that characterize the change in ownership status, we have 74 start events, and 41 stop events. Table 1 provides descriptive statistics for some firm-level

[9] The quality and reliability of the data set are documented by the fact that papers employing this survey have already been published in peer-reviewed journals (see, for example, Angelini & Generale, 2008; Benfratello et al., 2008; Casaburi & Minerva, 2011).

[10] See Appendix 8.1 for a detailed description of the firm-level variables employed in our analysis and, in particular, for a description of the question related to the ownership structure.

[11] Actually, among the firms who undergo multiple foreign ownership changes, there are only start-stop firms. No firm with a stop-start pattern is present.

[12] The trimming procedure that we adopt is explained in Appendix 8.1.

performance measures before and after the changes in ownership.

[Table 1 about here]

The table shows that both changes in ownership structure are associated with a decrease in performance over a three-year period. For example, if a firm starts to be a foreign affiliate during a certain wave, value added per worker goes down by 41% on average in the last year of the wave where the change occurred with respect to three years before (since the performance variables are measured in logarithms, their difference is a growth rate).[13] The capital stock shrinks by almost 27%, while Total Factor Productivity (TFP hereafter) goes down by 37%.[14] In the case of a start event, the only measure which seems not to be negatively affected by the change in ownership is the number of workers, which increases by 5%. Turning to the stop events, they show the same negative pattern (in this case also size is negatively affected), although the decrease is smaller in magnitude.

In the last two columns we report descriptive statistics for the firms which are always domestic or foreign owned over the entire period. The table confirms the well known result that foreign firms outperform their domestic counterparts in terms of size and productivity.[15] The comparison of the performance of firms changing ownership status (either due to a start or to a stop event) with firms which do not change status (always domestic or always foreign) unveils interesting results. The firms which start being foreign owned are characterized by an extremely high level of productivity (either in terms of value added per worker or in terms of TFP) before the start event takes place. This means that the target of foreign acquisitions are firms being highly efficient. This result is not new in the literature and goes under the heading of operational efficiency theory (see Harris & Robinson, 2002, and references therein). Also not new is the fact that, even if better firms are bought by foreign persons, there may be problems of governance and assimilation which induce the post-acquisition performance of starting firms to be poor. In the immediate post-acquisition period firms in our data set experience a decline in productivity of roughly 40%.

3.2 Measurement of civic capital

As mentioned earlier, we measure the stock of civic capital in a given province by average electoral turnout in referenda held between 1946 and 1987, the number of blood donations (per 1000 inhabitants), and the number of volunteers in non profit organizations (standardized again by 100,000 inhabitants). The choice of the proxies for civic capital is governed by the following reasoning. First, all activities are associated with a personal cost which often exceeds the mere opportunity cost of time devoted to these activities.[16] Second,

[13] Remember that information about ownership is provided for the last year of each wave. Let us consider an example to clarify the data structure. If a firm is classified as foreign owned in 2000, but was not so in 1997, we call this a start event. Clearly, we do not know whether the actual change has taken place in 1998, 1999 or 2000 itself. However, looking at the variation of one of the performance measures in 2000 with respect to 1997, we are sure that we are picking a point in time before the change in ownership (1997), and a point in time after the change or contemporaneous to it (2000).

[14] We will explain how to measure TFP below.

[15] Note that the two changes in ownership status (start and stop) differ in terms of the moment at which firms are foreign owned. While starters are foreign owned after the start event takes place, stoppers are foreign owned before the stop event. However, this has little impact in terms of the comparison of performance with purely domestic enterprises. Both starters and stoppers outperform domestic firms in terms of performance.

[16] For example, donating blood imposes some physical limitation for few hours after the donation, voting requires information gathering and evaluation of the different alternatives.

there are neither financial nor legal incentives to pursue these activities. Hence, the reason why individuals vote, donate blood or engage as volunteers is that they have internalized some common good for which they are disposed to incur costs, without receiving any material compensation. In section 2, we have outlined that the stock of civic capital consists exactly of these behavioral traits.

As each of our proxies of civic capital is supposed to be measured with error, we also extract the first principal component out of the three direct measures.[17] In this manner we get a regressor who captures the common component of the three proxies, net of the idiosyncratic factors which induce a certain participation pattern in some variables and not in others. The following table shows the correlation coefficient between the proxies and the resulting first principal component.

[Insert Table 2 about here]

As expected, we have a strong positive relationship between each of our three proxies. However, the fact that the correlation is far from being perfect implies that the proxies are blurred by idiosyncratic factors. The relationship between the first principal component and each of the three proxies is roughly equally strong which means that there is a strong common pattern. Figures 1, 2, and 3 show the geographic distribution of electoral turnout, blood donation, and volunteering, respectively. All three maps reveal that civic capital is higher in the Central and Northern part of the country. Figure 4 shows the geographic distribution across Italian provinces of the measure of civic capital based on the first principal component. As before, we find that civic capital is the highest in regions in the Center-North, like Emilia-Romagna, and the lowest in the Southern mainland and Sicily.

[Insert Figures 1, 2, 3, 4 about here]

In Table 3 we provide the full set of descriptive statistics for our data.

[Insert Table 3 about here]

4 Empirical strategy

In order to identify the impact of civic capital on firm performance according to the changes in firms' ownership, we fall back on a two-step procedure.[18] Our main performance measure is TFP.[19] In the first step, TFP is estimated by the semi-parametric approach proposed by Levinsohn & Petrin (2003). The advantage of this methodology is that it takes the potential endogeneity of the input factors into account. In particular, the choice of input quantities might be the outcome of firm productivity. More specifically, TFP is obtained by estimating separate production functions for each 2-digit NACE sector.[20] The generic production function in industry s is

$$y_{ijst} = \phi_1^s k_{it} + \phi_2^s sk_{it} + \phi_3^s unsk_{it} + \omega_{ijst}, \quad (1)$$

[17] In Appendix 8.2 we review how to compute the first principal component.

[18] This strategy is quite common in the literature. See for example Javorcik (2004) in the case of spillovers from FDI or Lopez (2009) in the case of exporters.

[19] In the robustness checks we replace it with value added per worker.

[20] In order to increase precision we use the entire sample for TFP estimation and not just those firms which are sampled for two consecutive waves at least.

where y_{ijst} labels the log of value added of firm i in province j in industry s at time t. Only in the case of TFP estimation, we employ yearly observations for nine distinct points in time, which correspond to the years from 1995 to 2003.[21] The logarithm of capital stock and the logarithm of the number of skilled and unskilled workers of the firm are denominated k_{it}, sk_{it}, and $unsk_{it}$, respectively. The logarithm of TFP is represented by ω_{ijst} and computed for each firm in the industry in each period of time.

In the second step, we regress the log of TFP on our variables of interest. Our estimation strategy is based on a difference-in-differences approach. We start from the following linear equation governing log TFP at the firm level:

$$\omega_{ijst} = \alpha_0 + \alpha_1 FO_{it} + \alpha_2(FO_{it} * CC_j) + \alpha_3(FO_{it} * \ln Pop_j) + \eta_t + \eta_j + \eta_s + \gamma_j t + \gamma_s t + \eta_i + \epsilon_{ijst}. \quad (2)$$

In this case, we employ three points in time, $t = \{0, 1, 2\}$, which correspond to the years 1997, 2000, and 2003: it is only for these years (the final years of each wave) that the complete set of information is available. In equation (2), foreign ownership of firm i is denominated by FO_{it}, a dummy which equals 1 if firm i is foreign owned at time t (a firm is foreign owned when the equity share held by foreigners reaches the 10% threshold). Civic capital in province j where firm i is located is labelled CC_j. In order to capture the differential impact of civic capital on firm performance, we add as a regressor the interaction of foreign ownership and civic capital, $FO_{it} * CC_j$. We also add the interaction of foreign ownership with the log of population in a given province, labelled $\ln Pop_j$, to control for the heterogeneity of the effect of FO in provinces with different local market size.[22] The parameter α_1 tells us what would be the impact of foreign ownership on productivity in provinces where the level of civic capital and the log of population were zero (there are no such provinces in our data set). The parameter α_2 indicates how foreign ownership affects productivity as civic capital increases. The parameter α_3 indicates how foreign ownership affects productivity as provincial population goes up. Lastly, we introduce the following array of terms: η_j and η_s capture all those time-constant features at the provincial and industry level which influence firm-level productivity; γ_t is a time effect on productivity; $\gamma_j t$ and $\gamma_s t$ are time trends in the effects at the provincial and industry level; η_i captures all remaining unobserved productivity heterogeneity at the firm level; finally, ϵ_{ijst} is the residual error term. We assume that the error term follows a AR(1) process, $\epsilon_{ijst} = \rho\epsilon_{ijst-1} + \nu_{ijst}$, with ρ close to one and ν_{ijst} being a white noise.[23] We think that this assumption is well-suited to capture the behavior of productivity at the firm level.

The holding of at least 10% of shares by foreign investors (i.e., the FO dummy variable) is by no means randomly assigned across firms. We explicitly consider different sources of selection bias.

A first source of selection bias concerns the location decision of foreign firms. An extensive literature studying the location decision of foreign firms has found that FDI is directed into areas with a favorable business environment (Head et al., 1995; Wei et al., 1999; Basile, 2004; Du et al., 2008). In particular, foreign investors prefer locations with well-functioning institutions, access to large markets and good infrastructure. These features may in turn have an impact on firm productivity. In our specification, these factors are captured by η_j, a term which controls for province fixed effects, and $\gamma_j t$, a province specific time trend. These characteristics of the firms' business environment, which influence simultaneously firm performance

[21] Because the UniCredit Survey is rotating, not all firms are observed for the full nine-year period.

[22] Population is averaged over the years 1995-2003.

[23] AR(1) error terms in the equation for productivity have been employed in this context from Griffith (1999) onward.

and attract foreign direct investment, may bias our OLS estimates if they are not removed from the error term, because they can induce correlation between the error term and foreign ownership.

A second source of bias is at the firm level. Several studies have proved that foreign investors acquire those domestic firms which display an above-average productivity level (Harris & Robinson, 2002; Salis, 2008). Table 1 shows that this pattern holds true also in our sample. Moreover, the table shows that firms receiving FDI are significantly larger in terms of capital stock and number of employees. This superiority may descend from firm characteristics such as managerial skills, sophisticated technologies, or brand names which are typically non-observable. All these features are captured by the firm-specific effect, η_i. If during the estimation procedure this term is not removed and goes into the error term, the OLS estimates will be biased again.

In order to overcome the potential endogeneity of FO descending from the above mentioned sources, we take equation (2) in first differences. Hence, all time constant effects at the firm level are wiped out. The change in log TFP between the last year of each wave can then be expressed as

$$\Delta\omega_{ijst} = \beta_0 + \alpha_1 \Delta FO_{it} + \alpha_2 \Delta FO_{it} * CC_j + \alpha_3 \Delta FO_{it} * \ln Pop_j + \gamma_t + \gamma_j + \gamma_s + \Delta\epsilon_{ijst} \tag{3}$$

where the term $\gamma_t = \eta_t - \eta_{t-1}$ is a new set of time effects, while γ_j and γ_s are industry and province specific effects, respectively, and derive from the time trends of equation (2).[24] Equation (3) is estimated through OLS for two time periods, $t = \{1, 2\}$, one corresponding to the productivity change between 1997 and 2000, the other corresponding to the change between 2000 and 2003. Conditional on our set of regressors, we assume that the correlation between the change in foreign ownership status, ΔFO_{it}, and the error term $\Delta\epsilon_{ijst}$ is zero. In this case the OLS applied to (3) are consistent. The fact that ϵ_{ijst} follows a AR(1) process with ρ close to one guarantees that $\Delta\epsilon_{ijst}$ satisfies the OLS model assumptions.[25] However, correlation of errors within the same province may descend from the fact that some key regressors (such as civic capital) are constant at the provincial level (Moulton, 1990). For this reason we cluster standard errors at the provincial level.[26] For each time period, the reference group in equation (3) consists of firms which do not change their ownership status; that is, those firms such that $\Delta FO_{it} = 0$, either domestically or foreign owned. Notice that from the estimation of the difference-in-differences model of equation (3) we retrieve the estimates of α_1, α_2, and α_3 from equation (2), which are the parameters that link the *level* of a firm productivity, ω_{ijst}, to the foreign ownership dummy, FO_{it}. In other terms, while the econometric identification of the model is based on the productivity change of firms which switch ownership status (from domestic to foreign, and viceversa) having as a reference those who do not change ownership, the results of the estimates can be also interpreted in terms of the relationship between the level of productivity and foreign ownership.[27]

[24] Adding an intercept β_0 or not to our difference-in-differences equation is immaterial for the estimation. The only thing to change is the interpretation of the time effects. We keep the common intercept β_0 in all the specifications.

[25] If ϵ_{ijst} is a white noise, differencing induces the error term $\Delta\epsilon_{ijst}$ to follow a MA(1) process. See also footnote 26 on this issue of potential serial correlation.

[26] A second type of correlation may occur within firms because, for the pairs of observations of firms sampled in both periods, we may face serial correlation. In other words, conditional on explanatory variables, the covariance of the error term for these firms across the two time periods is different from zero. This may arise if the parameter ρ in the AR(1) process of ϵ_{ijst} is well below one. Because the pairs of firm observations are nested within provinces, clustering based on the province will also resolve this issue. See on this Cameron & Miller (2010).

[27] This explains why in the paper we talk interchangeably of the effect of foreign ownership on performance, having in mind

In the context of our study it may be instructive to differentiate according to the type of ownership change that a firm undergoes. We have argued that the post-acquisition assimilation problems are particularly strong in the case of a foreign investor. On the contrary, when the change in ownership is brought about by a domestic investor, the post-acquisition performance can be thought to be less affected by the change. For these reasons, we expect the negative variation in performance after a start event (when a foreign investor comes in) to be larger in absolute terms than the variation after a stop event (when a domestic owner replaces a foreign one). This conjecture is confirmed by the descriptive evidence of Table 1, where the short-run decline in productivity (either in terms of value added per worker or in terms of TFP) is larger in the case of a start event than in the case of a stop event. To check this more precisely in the framework of our econometric model, for each start event at the firm level we create a dummy variable $START$ which equals one whenever $\Delta FO = +1$, and for each stop event we create a dummy variable $STOP$ which equals one in the case that $\Delta FO = -1$. We end up with the following model:

$$\begin{aligned}\Delta\omega_{ijst} = \delta_0 + \delta_1 START_{it} + \delta_2 START_{it} * CC_j + \delta_3 STOP_{it} + \delta_4 STOP_{it} * CC_j \\ + \delta_5 START_{it} * \ln Pop_j + \delta_6 STOP_{it} * \ln Pop_j + \gamma_t + \gamma_j + \gamma_s + \Delta\epsilon_{ijst}.\end{aligned} \tag{4}$$

As before, for each time period, the baseline group consists of firms which do not change ownership status. The model in equation (3) is nested in the model of equation (4). The former is obtained from the latter if the following linear restrictions are imposed: $\delta_1 = -\delta_3$, $\delta_2 = -\delta_4$, and $\delta_5 = -\delta_6$.

5 Results

5.1 A simple graph

In this subsection we provide some preliminary evidence through simple graphs on the relationship between civic capital and the differences in pre-and post acquisition performance.

Figure 5 shows the shifts in the distribution of TFP in the time period immediately before (light gray box) and immediately after (dark gray box) the ownership change takes place, considering the transition into and out of foreign ownership separately.[28] In order to highlight the importance of civic capital, we have split the sample into high and low civic capital provinces, according to whether the stock of civic capital in a province is above or below the median value of its distribution. Coherently with the descriptive evidence of Table 1, we find that both a start and a stop event is associated with a short-run decrease in firm performance.[29] Again, the decline in performance is larger for starters than for stoppers for each subset of

the relationship between ω_{ijst} and FO_{it}, and of the effect of the change in foreign ownership status on performance, having in mind the relationship between $\Delta\omega_{ijst}$ and ΔFO_{it}.

[28] The following example clarifies the procedure. Consider a firm which is acquired by a foreign investor during the 1997-2000 period. This means that the firm is reported to be domestic in 1997 and foreign in 2000. Then, we consider the year 1997 to be the time period immediately before the acquisition, and 2000 to be the time period immediately after it.

[29] The plots are read in the following way. The rectangular box depicts the interquartile range of the distribution, with the horizontal line within the box being the median. The end of the upper (lower) whisker is the highest (lowest) adjacent value, which is the highest (lowest) value that can be found after adding (subtracting) to the third (first) quartile the product of 1.5 times the interquartile range. Dots beyond the adjacent values depict outliers; that is, values farther away than 1.5 times the interquartile range. In some cases the whisker cannot be visually identified, because there are few values which are very close one to the other. We exclude from the plot observations from firms which experience both a start and a stop event over

provinces (high civic capital and low civic capital). This comes as no surprise, given that after a start event foreign affiliates have to operate in a new business environment, something which is associated with large assimilation and governance costs. In the case of a stop event, the domestic investor replacing the foreign one seems less affected, arguably because he is more experienced in running an Italian business firm, and this decreases the post-acquisition difficulties.

Comparing the decline in performance across the two subsets of provinces, we find that it is more pronounced in provinces where civic capital is low. This pattern is particularly evident for start events.[30] The average productivity decline of this event is -0.48 in low civic capital provinces, as opposed to a variation of only -0.09 in provinces where civic capital is high. This is in line with what we expected, given that we believe that the cooperation-enhancing effect of civic capital helps foreign investors to overcome the difficulties associated with the change in ownership. In areas with high civic capital asymmetric information is less likely to be opportunistically exploited in the bilateral relationships between the affiliate and its headquarters.

[Insert Figure 5 about here]

5.2 Baseline regression results

To begin with, we do a simple regression where the growth rate of productivity is regressed on the foreign ownership status change plus a set of year, province, and industry fixed effects. The difference with respect to the model of equation (3) is that in this first regression we omit the interaction terms.[31] This exercise aims at assessing the impact of the foreign ownership change irrespectively of the degree of civic capital of the province where the firm is located. The estimates are presented in column (1) of Table 4.

[Insert Table 4 about here]

A negative point estimate implies that firms which become foreign owned ($\Delta FO = +1$) perform on average worse than firms which do not change ownership status. This may signal an adverse effect of foreign acquisitions on performance, but the evidence is inconclusive due to the high standard errors involved. This is perfectly in line with the paper by Benfratello & Sembenelli (2006), where they get a negative point estimate for the effect of foreign ownership on productivity, although the parameter is not statistically different from zero in most of the specifications. Also Harris & Robinson (2002)'s findings, although rather mixed, point to the fact that plants acquired by foreign investors may experience lower productivity after the acquisition.[32]

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the three-wave period. In this case there are several ways of assigning observations to the before/after start/stop categories, and hence there are several possible plots. However, the basic insights of the figure stay the same irrespectively of the specific assignment of these observations.

[30] This statement is based on median values. In high civic capital provinces, the decline in TFP is equal to -0.09 under a start event, and -0.03 for a stop event. The corresponding values in low civic capital areas are -0.48 (start), and -0.33 (stop).

[31] In formal terms, the equation is

$$\Delta\omega_{ijst} = \beta_0 + \alpha_1 \Delta FO_{it} + \gamma_t + \gamma_j + \gamma_s + \Delta\epsilon_{ijst}.$$

[32] In their paper, the point estimates of the post-acquisition dummies are negative in four out of six years considered in the analysis. However, of these four negative dummies, only three of them are statistically different from zero.

Summing up, foreign ownership in the short run is associated with a deterioration of the performance in terms of productivity. The point estimate turn out to be negative, although the coefficients are seldom statistically different from zero. The contribution of our paper consists in shedding light on this fact. To do so, we present regression results from our fully fledged model. We experiment with different measures of civic capital. In column (2), civic capital is proxied by the log of electoral turnout in referenda, in column (3) the log of the number of blood donations is used, whereas in column (4) the log of volunteers is employed. Finally, the last column displays the regression when civic capital is measured by the first principal component of the three variables. In all columns, the log of provincial population, interacted with the change in the foreign ownership dummy (ΔFO), controls for the effect of the size of the local market on the productivity growth of foreign firms.

In each specification with the civic capital interaction, the coefficient α_1 on the variable of the change in the foreign ownership status is negative and significant. This means that in the (hypothetical) province in which both the log of population and civic capital are zero, firms which become foreign owned ($\Delta FO = +1$) perform on average worse than firms which do not experience a change in ownership (the control group). In this type of province there is evidence of a strong but adverse effect of foreign ownership on productivity. On the other hand, the positive and significant interaction coefficient of foreign ownership and civic capital (α_2) implies that the effect of foreign ownership on productivity is not homogeneous across provinces. The positive estimate for α_2 means that the post-acquisition decrease in TFP is less pronounced where the stock of civic capital is higher. In the conceptual framework we have explained this phenomenon on the basis of the hampering of narrow-minded self-interested behavior which typically plagues internal transactions. Provinces endowed with a high stock of civic capital provide an environment where governance and assimilation costs faced by foreign investors are reduced. This result holds for each proxy of civic capital and is statistically very significant.[33]

We also get a highly significant coefficient for the interaction of ΔFO and the log of population. This means that, as the size of the local areas (in terms of population) goes up, the performance of foreign firms improves. This may descend from some forms of agglomeration economies that are beneficial to foreign firms. This result allows to rationalize findings such as those of Basile (2004), who documents that foreign acquisitions in Italy are concentrated in areas where local demand is large.

5.3 Estimating separate coefficients for start and stop events

We now turn to the estimation of equation (4), where we allow the effect of ownership changes to differ for the start and the stop events respectively.

As before, we estimate the simplified version of our model, where all the interaction terms are dropped.[34] The point estimates in column (1) of Table 5 indicate that, immediately after a start event, firms experience

[33] In order to exactly quantify the effect of foreign ownership at different points of the distribution of civic capital we should perform F-tests on linear restrictions involving α_1 and α_2. To save on space, we do this exercise only for the model where the effect of start and stop events is estimated separately (see below).

[34] The simplified model is

$$\Delta\omega_{ijst} = \beta_0 + \delta_1 START_{it} + \delta_3 STOP_{it} + \gamma_t + \gamma_j + \gamma_s + \Delta\epsilon_{ijst}.$$

a lower TFP, while a stop event is associated with an increase in TFP, compared to the case where no ownership change occurs.[35]

[Insert Table 5 about here]

Each column from (2) to (5) in Table 5 corresponds to a different civic capital variable. Consider first the case of the switch into foreign ownership ($START$). The estimates for δ_1 is negative. Hence, a switch into foreign ownership brings productivity down if civic capital and population were zero. The positive coefficient of the interaction term δ_2 implies that the effect on productivity is higher for firms that are located in provinces where civic capital is higher. Only when civic capital is measured by volunteering this effect is not significant. In the case of electoral turnout and in the case of the principal component of the three proxy variables the interaction term is statistically significant at the 1% level.

In order to quantify more precisely the effect of a start event on TFP growth, we evaluate its marginal effect at different points of the distribution of civic capital. We consider the first quartile, the median and the third quartile of the distribution of civic capital in provinces that host at least one start event over the 9-year period of observation.[36] Unless otherwise stated, the log of provincial population is always fixed at the sample mean (equal to 6.011). If the switch into foreign ownership takes place in a province such as Rome, with an endowment of civic capital in terms of the principal component of -.419 (first quartile of the distribution of provinces with some start event), the marginal effect of the ownership change is negative, reaching -.168. To see whether this value is statistically different from zero, we perform an F-test on the linear restriction $(\delta_1 + \delta_2 \times -.419 + \delta_5 \times 6.011) = 0$ and find that we can reject the null hypothesis that the linear restriction equals zero at the 1% level; that is, the decrease in productivity growth associated with a start event is statistically different from zero at the 1% level. If we plug in the linear restriction the true value of the population of Rome we get a marginal effect equal to -.060, which is not statistically different from zero at the 10% level. Hence, we can conclude that if Rome was not such a big local area, and had just a mean value of population, the post-acquisition performance of foreign firms would undoubtedly be negative, due to the relatively low level of civic capital.

Let us now consider the impact on productivity of an ownership change in the median province in terms of civic capital among those with some start event (the province is Prato, with a value of CC equal to .841). In this case, evaluating the marginal effect at the mean level of population, we get a value of -.075. The F-test reveals that we cannot reject the null hypothesis that the linear restriction is zero at the 10% level. For the province with the highest level of civic capital (Forlì-Cesena, with a value of 2.193) we find a positive point estimate of the marginal effect of civic capital equal to .025, being not statistically different from zero. Overall, our findings confirm the following facts. Apart from provinces with a very high level of civic capital, the point estimate of the effect of foreign ownership on productivity is negative. This negative sign is statistically different from zero at the 1% level in the case of provinces with a relatively low level

[35]The positive point estimates for the productivity effect of a stop event is not in accordance with the descriptive evidence of Table 1 and Figure 5: once we control for a series of industry, province, and time effects, the stop event seems to foster productivity growth, rather than to halt it. This positive estimate is reassuring, because the specification of our econometric model of equation (3) assumes that the effect of a start event ($\Delta FO = +1$) is the opposite of that of a stop event ($\Delta FO = -1$). See also footnote 37 on this issue.

[36]In this manner we are assessing the impact of a start event in provinces that really experienced a foreign acquisition.

of civic capital (and a relatively small local market size). The main contribution of our paper is to show that a key determinant of the assimilation costs incurred by foreign firms, and hence their post-acquisition performance, is the degree of opportunism characterizing the area where the firm is located. Where civic capital is high, the growth rate of TFP of firms that switch into foreign ownership is not statistically different from firms which do not display any change in ownership. According to our conceptual framework, in these kind of provinces advantages and disadvantages of foreign ownership compensate each other so that the net effect on productivity is not significantly different from zero. Where civic capital is low, in turn, disadvantages due to governance costs are prominent and the performance of firms acquired by foreign investors is significantly lower than that of constant ownership firms.

The pattern we have just described is reversed when we consider the switch from foreign into domestic ownership (stop event). In this case the coefficient δ_3 (measuring the impact of the stop dummy when civic capital and log population are zero) is positive, while δ_4 (the coefficient of the interaction term with civic capital) is negative, although the last term is never statistically different from zero. The first thing to note is that the unconditional estimate of Table 1 (where a stop event was associated to a decrease in productivity) was quite misleading, since the estimates of the model in equation (4) predict that there is a positive impact of a stop event in low-civic-capital low-population areas. The second is that these results may be influenced by two factors. On the one side, the sign of the point estimates of δ_3 and δ_4 may indicate a large drop in governance costs induced by the stop event. In the case of a stop event, a domestic investor is replacing a foreign one. We have argued above why it is reasonable to think that domestic owners are less affected than foreign ones by governance and assimilation costs. The beneficial effect of domestic ownership is particularly strong where civic capital is low and the local market size is small.[37] On the other side, we have to be cautious on the interpretation of these parameters, as the fact that δ_4 is not statistically different from zero may signal noise in the estimation of the effect of stop (the number of stop events in our data set is roughly half of that of start events, see Table 1).

6 Discussion and robustness of the analysis

We now further discuss the problem of endogeneity and what is the impact on the estimation results. Then, we provide some robustness checks to our analysis.

6.1 Further endogeneity concerns

An issue that is worth taking into account is the fact that foreign firms' acquisitions can be concentrated in some selected areas. If firms of the same type (in terms of some unobserved characteristic) tend to locate in the same areas this could induce a bias in our estimation. To clarify the issue, we consider the following case which may arise in our context.

Let us assume that foreign investors take the future governance and assimilation costs induced by the

[37] The fact that the sign of the estimates of δ_3 and δ_4 is the opposite of that of δ_1 and δ_2 is reassuring, provided that the model in equation (3) is obtained from the model in equation (4) if the following linear restrictions are imposed: $\delta_1 = -\delta_3$, $\delta_2 = -\delta_4$, and $\delta_5 = -\delta_6$. If we test these linear restrictions after having estimated equation (4), they are not rejected by an F-test at the 10% level of statistical significance.

ownership change into account when deciding where to invest. Given that civic capital decreases governance costs, we may have a non-random selection into treatment which introduces an endogeneity bias in our analysis. In particular, foreign investors who expect for some reason their firms to perform poorly after the acquisition may seek to go in areas where civic capital is higher, to reduce at least the impact of governance costs. On the contrary, foreign investors with an idiosyncratically low tendency to post-acquisition problems may care less about the civic capital of the province where they are investing, and so have a higher chance of landing up in areas with low civic capital. We take comfort from the fact that this kind of self-selection tends to bias our estimates downwards. Since we find that foreign firms in high civic capital areas tend to perform better than foreign firms in low civic capital areas, the fact that "bad" foreign investors (in terms of post-acquisition performance) are going in high civic capital areas would cause an underestimation of the true positive effect of civic capital on the performance differential.

Another source of endogeneity may descend from the following fact. While the specification in first differences eliminates all sort of unobservables at the firm level that are time constant, we cannot exclude that foreign investment is based on a certain growth pattern at the individual level. For example, it could be the case that start events are more frequent in firms experiencing a higher TFP growth rate. In the robustness analysis we describe how we try to deal with this problem.[38]

6.2 Robustness of the analysis

In Table 6 we perform some robustness checks. We present the results when we introduce the $START$ and $STOP$ dummies.[39] Columns (1) - (4) show several variations of equation (4). In column (1) we measure the size of the local market by provincial gross domestic product instead of population.[40] There is a tiny decrease in magnitude but the coefficients are still statistically different from zero.

In column (2) we control for a wider array of provincial control. We introduce the interaction of the $START$ and $STOP$ dummies with the log of the share of university graduates at the provincial level, and with the log of the length of trials in civil affairs. The precision of the estimate of δ_2 is somehow affected (the coefficient is now significant at the 10% level only). We explain this fact with the sizeable multicollinearity among the provincial regressors, which inflates the standard errors.

In column (3) we include firm level controls into the productivity regression, such as the growth rate of total size (in terms of workers), of the capital stock and of the number of skilled workers. The inclusion of the growth rate of firm-level variables tries to reduce firm-specific unobserved heterogeneity upon which foreign acquisitions can be based. As an example, we mentioned above the case where start events could be more frequent in firms experiencing a higher TFP growth. Results show very little sensitivity to the addition of these variables, so we are somehow reassured by this.

Next, in column (4) we exclude observations located in Milan, the province with the largest number of starters. Results reveal that they are not driven by this province.

[38]The straight way to tackle this issue would be to add to the growth equations (3) or (4) a firm-specific term ν_i, and then to proceed with standard panel data methods. This amounts to adding a term equal to $\nu_i t$ in equation (2), getting what is sometimes called a random trend model. We abstain to follow this route provided the low number of firms with two observations in terms of growth rates (these are the firms which are surveyed in all three waves).

[39]The results in terms of the ΔFO variable do not show any significant difference.

[40]Similarly to provincial population, we average gross domestic product for each province over the period 1995-2003.

Finally, in columns (5) we measure firm performance by labor productivity, defined as value added per worker. Results are robust also to this change in the measurement of the dependent variable.

7 Conclusion

In this article, we empirically show that the effect of foreign ownership on firm performance depends on the stock of civic capital in the area in which the firm is located. Starting from a model where the productivity of a firm is assumed to depend on the foreign ownership status, we have turned to a difference-in-differences approach in order to identify the effect of foreign ownership and civic capital on productivity. We have found that civic capital has a statistically significant positive effect on the productivity of foreign firms. When we estimate the effect of start and stop events separately, in the case of firms that cease to be foreign owned (thus becoming domestic again) we find an effect which is not statistically different from zero. Overall, these results suggest that civic capital substantially decreases assimilation and governance costs of foreign firms.

The estimation approach took explicitly into account unobserved firm-level heterogeneity, as well as industry, province, and time trends. Our main measure to quantify firm performance is total factor productivity, estimated by the approach suggested by Levinsohn & Petrin (2003).

This study provides an important new insight on the effect of foreign ownership on firm performance. Rather than assuming that assimilation and governance costs of foreign affiliates are constant within a country, we stress the importance of informal institutions at the local level, and in particular we show that the level of local civic capital exerts an effect on these costs and ultimately on performance.

We believe that future research on the topic should address the following issues. First of all, our analysis admittedly provide a short run view on the TFP dynamics. We analyze TFP changes and ownership changes that occur over a period of three years only (the lapse of time between two consecutive waves). We cannot exclude that the productivity implications of foreign acquisitions may be different when affiliates are observed over a longer period of time. Another important issue that deserves more attention in the future is to understand whether the nationality of the investor plays a role, in conjunction with civic capital, in shaping the performance of foreign affiliates. Results such as those in Benfratello & Sembenelli (2006) highlights that the nationality of the investor can make a difference. Unfortunately, the UniCredit data set does not allow to retrive the nationality of the foreign investor. This would be an interesting piece of information, since one could investigate if and how the cultural distance between the investing country and the recipient country interact with civic capital to influence the performance of foreign firms.

8 Appendix

8.1 Detailed description of the data set

8.1.1 Firm-level variables

Value added: Value added, deflated by 2-digit NACE producers' price indices obtained from Istat tables. Base year is 2000. Source: AIDA.

Capital stock: Fixed assets, deflated through an average of the 2-digit price indices employed for value added. Base year is 2000. Source: AIDA.

Skilled workforce: Skilled workers include entrepreneurs, executives and white collars. Source: UniCredit Survey.

Unskilled workforce: Unskilled workers include blue collars. Source: UniCredit Survey.

Here we report the question A7 from the UniCredit Survey regarding the ownership structure.

A7. State, in a descending order in terms of voting securities owned, the characteristics of persons that own and/or directly control the enterprise.

	Persons (keep anonymous)	Type of person (see *Note*)	Share of voting securities held by the person	Does the person exert a direct control on the firm?	Does the person have voting deals with others?
A7.1	Person a	1 2 3 4 5	%	1. Yes 2. No	1. Yes 2. No
A7.2	Person b	1 2 3 4 5	%	1. Yes 2. No	1. Yes 2. No
A7.3	Person c	1 2 3 4 5	%	1. Yes 2. No	1. Yes 2. No
A7.4	Others		%		
	Total		100%		

Note: Indicate as follows: 1) Person non resident in Italy; 2) Physical person resident in Italy; 3) Italian business enterprise operating in manufacturing; 4) Italian business enterprise operating in services; 5) Italian banks and other Italian financial institutions.

8.1.2 Trimming procedure

Observations which display an extreme growth rate in value added, capital stock, number of blue collars, or number of white collars are excluded from the regression. A growth rate is considered as extreme if it belongs to the upper (99.5%) or lower (0.5%) tail of the distribution of growth rates. Growth rates are calculated for each couple of subsequent years within the period 1995-2003.

8.1.3 Measures of civic capital

Blood donations: The number of blood donations per 1000 inhabitants, disaggregated by province. The data are collected from the health authorities of Italian regions. In each region, regional health authorities collect data on blood donations and subsequently send this information to the Superior Institute of Health (*Istituto Superiore di Sanità*) which, in turn, maintains a National and Regional Registry of Blood and Plasma. Provincial data on blood donations are not available for Apulia and Lazio. For the provinces of these two regions we take the total regional value. Data refer to the year 2002 and the source is Cartocci (2007) on data from the Superior Institute of Health.

Volunteers: It is the number of volunteers in non-profit organizations per 100,000 inhabitants. Data refer to the year 2000 and the source is de Blasio & Nuzzo (2010).

Referenda turnout: It is the average provincial electoral turnout for the referenda on the choice between republic and monarchy (1946), divorce (1974), public financing of political parties (1978), public security and anti-terrorism measures (1981), abortion (1981), wage escalator regulations (1985) and nuclear power and hunting regulations (1987). The following eight provinces were created after 1995: Biella, Lecco, Lodi, Rimini, Prato, Crotone, Vibo Valentia, Verbano-Cusio-Ossola. The provinces to which they belonged before 1995 and whose value has been assigned to them appear in parenthesis: Biella (Vercelli), Lecco (simple average of Bergamo and Como), Lodi (Milan), Rimini (Forlì-Cesena), Prato (Firenze), Crotone (Catanzaro), Vibo Valentia (Catanzaro), Verbano-Cusio-Ossola (Novara). The source of data for referendum turnout is the Ministry of the Interior.

8.1.4 Other provincial covariates

Population: Total population per province expressed in thousands of inhabitants, averaged over the period 1995-2003. Source: Istat.

GDP: Provincial value added expressed in millions of Euro, averaged over the period 1995-2003. Source: Istat.

Length of trials: It is the number of days it takes to complete a first degree trial in civil affairs in each of the 165 Italian labor courts. The data are averaged over the years 1995-2003 and are provided by Istat in the data base Territorial Information System on Justice (Sistema Informativo Territoriale sulla Giustizia). Since there are more courts than provinces and since in some cases the territory of a court belongs to two different provinces we proceed as follows. First, we assign to each city of the province the value of the court to which the city belongs. This information is then averaged for all the cities belonging to the same province to get a provincial variable.

University graduates: It is the number of university graduates per province, divided by total provincial population. The data refer to the 2001 Census of the population and are from Istat.

8.2 Derivation of the first principal component

The intuition of principal component analysis (PCA) in our context is the following: given the three proxies of civic capital, each province corresponds to a point in a three dimensional vector space. The idea of PCA is to find a linear combination of the three variables which re-expresses the original data set in such a way that it captures most of the common variance. This linear combination corresponds to the first principal component.

In general terms, the first principal component can be derived as follows (see Jolliffe, 2002): vector $\mathbf{x}$ denominates the data consisting of p random variables (the three proxies of civic capital in our case) and vector $\alpha_{\mathbf{1}}$ consists of p constants, $\alpha_{11}, \alpha_{12}, \ldots \alpha_{1p}$. Consider the linear function $\alpha_{\mathbf{1}}'\mathbf{x}$:

$$\alpha_{\mathbf{1}}'\mathbf{x} = \alpha_{11}x_1 + \alpha_{12}x_2 + \ldots + \alpha_{1p}x_p = \sum_{j=1}^{p} \alpha_{1j}x_j \tag{5}$$

Finding the first principal component amounts to determine the elements of $\alpha_{\mathbf{1}}$ which maximize the variance of $Var[\alpha_{\mathbf{1}}'\mathbf{x}] = \alpha_{\mathbf{1}}'\mathbf{S}\alpha_{\mathbf{1}}$, where $\mathbf{S}$ is the covariance matrix of $\mathbf{x}$. The vector $\alpha_{\mathbf{1}}$ is constrained to have unit length, which implies that $\alpha_{\mathbf{1}}'\alpha_{\mathbf{1}} = 1$. The corresponding Lagrange maximization function takes the following form:

$$\alpha_{\mathbf{1}}'\mathbf{S}\alpha_{\mathbf{1}} - \lambda(\alpha_{\mathbf{1}}'\alpha_{\mathbf{1}} - 1). \tag{6}$$

Maximizing (6) with respect to $\alpha_{\mathbf{1}}$ gives

$$(\mathbf{S} - \lambda I_p)\,\alpha_{\mathbf{1}} = 0, \tag{7}$$

in which the Lagrange multiplier λ is the eigenvalue of $\mathbf{S}$ and the corresponding eigenvector is $\alpha_{\mathbf{1}}$. I_p is the p-dimensional identity matrix. Because the quantity to be maximized is $\alpha_{\mathbf{1}}'\mathbf{S}\alpha_{\mathbf{1}} = \alpha_{\mathbf{1}}'\lambda\alpha_{\mathbf{1}} = \lambda$, the eigenvector with the highest eigenvalue is chosen. The first principal component is then $\alpha_{\mathbf{1}}'\mathbf{x}$. In our data, the highest eigenvalue takes the value of 2.48. The associated eigenvector explains 75% of the total variance.

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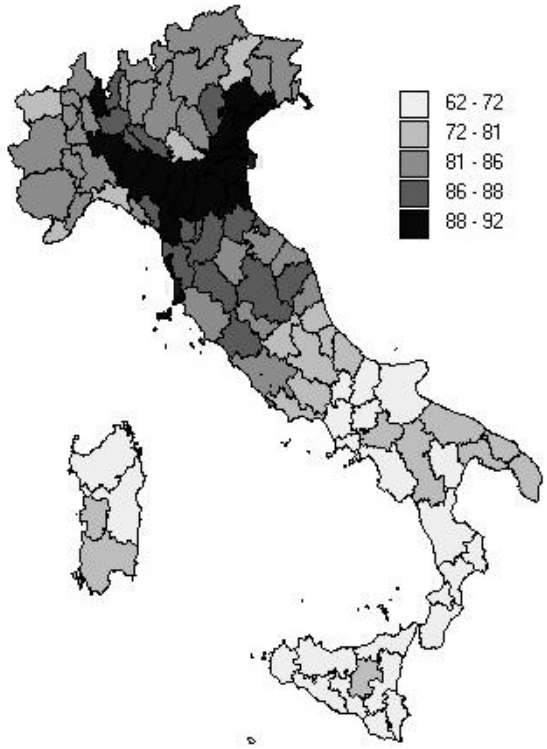


Figure 1: Map of electoral turnout in referenda, averaged over 7 referenda that took place between 1946 and 1987.

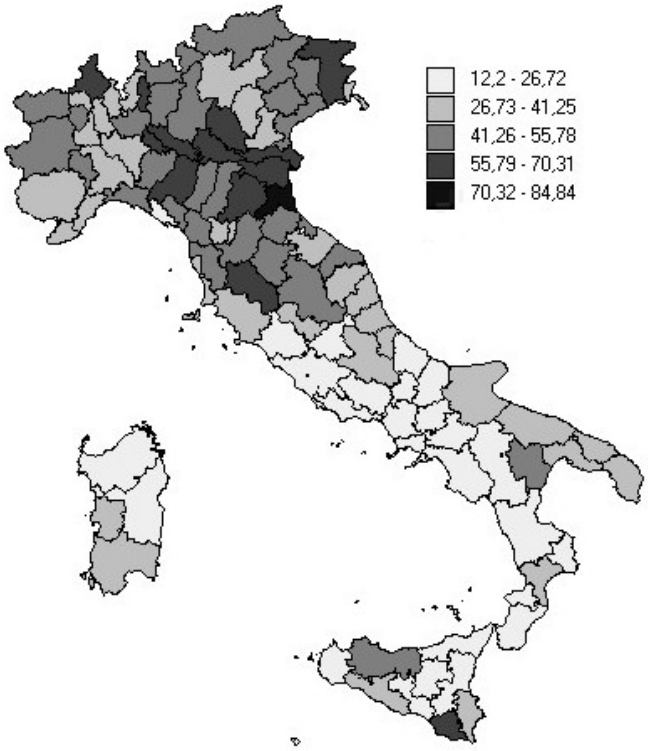


Figure 2: Map of blood donations per 1000 inhabitants.

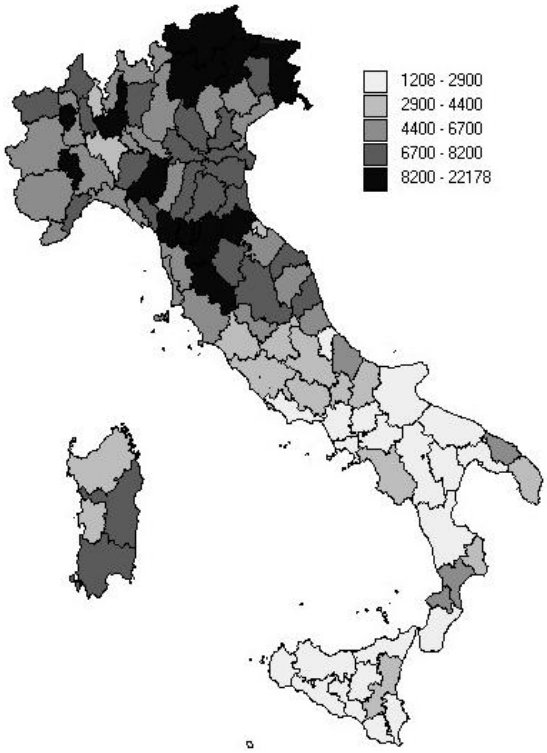


Figure 3: Map of the number of volunteers in non-profit organizations per 100,000 inhabitants.

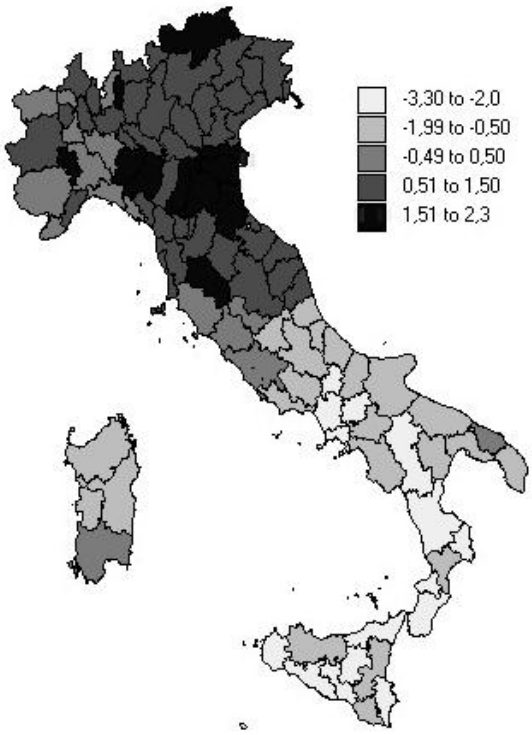


Figure 4: Map of civic capital measured by the first principal component of blood donations, volunteering, and electoral turnout.

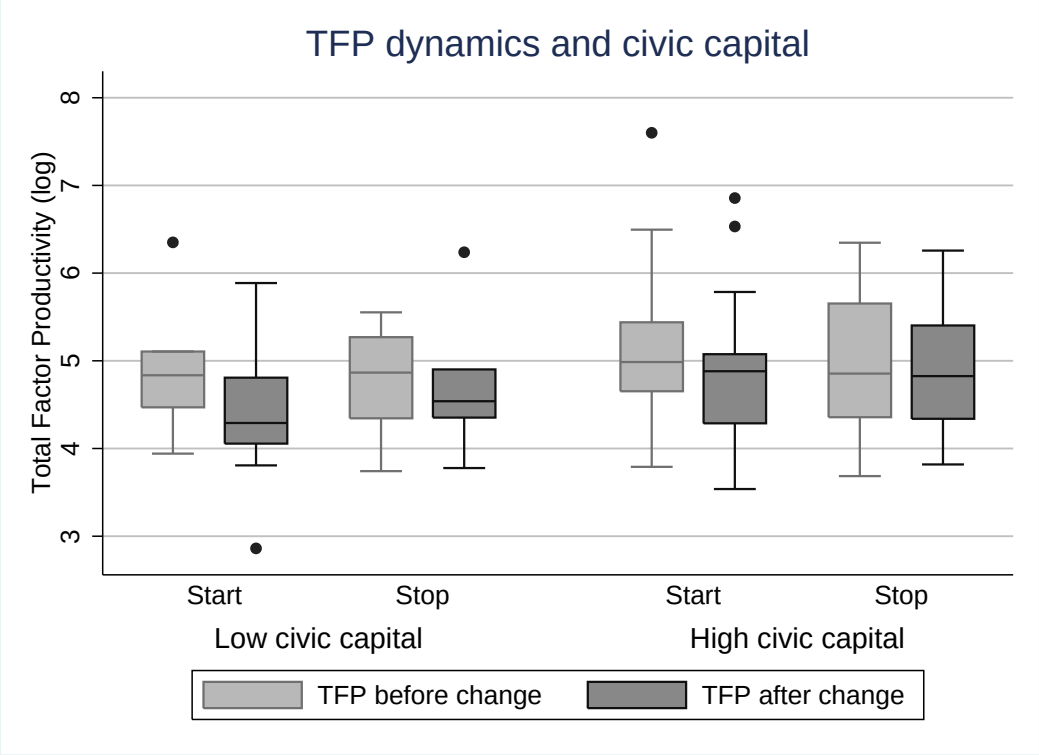


Figure 5: This graph plots the distribution of TFP before (light gray) and after (dark gray) a start or a stop event, for low civic capital provinces and high civic capital provinces respectively. The dots outside the boxes are outliers.

Table 1: Firm performance and ownership structure

	START event			STOP event			Always	Always
	Before	After	Variation	Before	After	Variation	Domestic	Foreign
Value added per worker (log)	4.301	3.889	-.411	4.021	3.866	-.155	3.684	3.897
Capital stock (log)	8.256	7.990	-.265	8.023	7.990	-.033	6.981	9.135
Workers (log)	4.162	4.210	.048	4.291	4.252	-.039	3.596	4.936
Total Factor Prod. (log)	5.071	4.704	-.367	4.778	4.710	-.067	4.387	4.961
Obs.	74	74	74	41	41	41	1836	16

Note: The table shows the performance of the firms according to different types of ownership structure. First of all, we describe some firm-level variables before and after the two events that characterize the change in ownership (starting to be foreign owned and stopping to be foreign owned). The variation is measured over periods of three years (1997-2000 or 2000-2003). The last two columns summarize data for firms which are always domestically owned and firms which are always foreign owned over the entire period. The different performance measures are: *Value added per worker* is the log of value added divided by the total number of workers employed by the firm; *Capital stock* is equal to fixed assets; *Workers* is the total number of employees; *Total Factor Productivity* is a residual term whose computation follows Levinsohn & Petrin (2003).

Table 2: Correlation among the proxies of civic capital

	Referenda turnout (log)	Volunteers (log)	Blood donations (log)
Volunteers (log)	0.69	1	
Blood donations (log)	0.61	0.57	1
Principal component	0.89	0.87	0.84

Note: The number of observations is 103. *Blood donations* is the log of the number of blood donations per 1000 inhabitants inn 2002; *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Principal component* is the the first principal component of the above mentioned three proxies of civic capital. All correlations are statistically different from zero at the 1% level.

Table 3: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	1st Quartile	Median	3rd Quartile
Dependent variables								
Total Factor Productivity (log)	1989	4.417	0.650	2.619	8.802	4.001	4.375	4.769
Value added per worker (log)	1989	3.699	0.435	2.021	6.065	3.436	3.695	3.959
Civic capital variables								
Referenda turnout (log)	103	4.378	0.108	4.129	4.516	4.3	4.419	4.466
Blood donations (log)	103	3.568	0.415	2.501	4.44	3.285	3.635	3.842
Volunteers (log)	103	8.533	0.627	7.097	10.007	8.146	8.599	8.928
Principal component	103	0	1.5	-3.347	2.307	-1.231	0.451	1.13
Other explanatory variables								
Population (log)	103	6.011	0.707	4.500	8.229	5.527	5.909	6.426
GDP (log)	103	8.858	0.799	7.079	11.598	8.346	8.800	9.253
University graduates (log)	103	1.854	0.175	1.455	2.453	1.733	1.846	1.935
Length of trials (log)	103	6.955	0.359	5.948	7.856	6.736	6.974	7.171
Workers (log)	1989	3.656	1.004	2.398	8.558	2.944	3.401	4.078
Capital (log)	1989	7.074	1.568	2.421	14.550	6.045	6.980	7.965
Skilled (log)	1989	2.375	1.071	0	7.378	1.609	2.197	2.833

Note: The table provides descriptive statistics for the variables used in the regressions. The dependent variables are: *Total Factor Productivity* is the log of TFP, computed according to Levinsohn & Petrin (2003); *Value added per worker* is the log of value added divided by the total number of workers employed by the firm. We consider the following variables to measure civic capital: *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Blood donations* is the log of the number of blood donations per 1000 inhabitants in 2002; *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Principal component* is the first principal component of the above mentioned three proxies of civic capital. The provincial controls are: *Population* is the log of provincial population, averaged over the years from 1995 to 2003; *GDP* is the log of provincial value added, averaged over the years from 1995 to 2003; *Length of trials* is the provincial log of the length, expressed in days, to complete a first degree trial averaged over the period 1995-2003. *University graduates* is the log of the share of provincial population holding a university degree in 2001. The firm-level controls are: *Workers* is the total number of employees; *Capital stock* is equal to fixed assets; *Skilled* is the total number of entrepreneurs, executives and white collars.

Table 4: TFP dynamics and ownership change: ΔFO variable.

	(1) No interactions Coef./se	(2) Turnout Coef./se	(3) Blood Coef./se	(4) Volunteers Coef./se	(5) Principal comp. Coef./se
ΔFO	-0.029	-5.329***	-1.422***	-1.943***	-0.772***
	(0.034)	(1.655)	(0.351)	(0.631)	(0.220)
$\Delta FO * \ln Turnout$		1.046***			
		(0.377)			
$\Delta FO * \ln Blood$			0.210**		
			(0.094)		
$\Delta FO * \ln Volunteers$				0.137**	
				(0.061)	
$\Delta FO *$ *Principal comp.*					0.072**
					(0.028)
$\Delta FO * \ln Population$		0.100***	0.091***	0.107***	0.104***
		(0.033)	(0.030)	(0.037)	(0.034)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.352	0.356	0.355	0.355	0.356
Obs.	1989	1989	1989	1989	1989

Note: The table presents the results of OLS estimates. Fixed effects for each 2-digit industry, each province, and each time period are included. The dependent variable is the change in log TFP, $\Delta\omega_{ijst}$. ΔFO captures changes in ownership and takes the following values: $\Delta FO = +1$ if a firm becomes foreign; $\Delta FO = -1$ if a firm becomes domestically owned; $\Delta FO = 0$ if a foreign does not change ownership status (it stays domestically or foreign owned). We use the following variables to measure civic capital: ln *Turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; ln *Blood* is the log of the number of blood donations per 1000 inhabitants in 2002; ln *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *CC* is the first principal component of the above mentioned three proxies of civic capital. We also include as a control ln *Population*, which is the log of provincial population averaged over the period 1995-2003. Standard errors are clustered at the provincial level, in order to allow for correlation between observations located in the same province. ***,**,* denote significance at the 1%, 5%, 10% level, respectively.

Table 5: TFP dynamics and ownership change with civic capital interactions: *START* and *STOP* dummies.

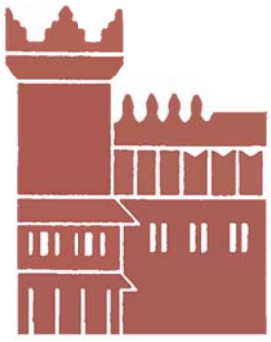
	(1) No interactions Coef./se	(2) Turnout Coef./se	(3) Blood Coef./se	(4) Volunteers Coef./se	(5) Principal comp. Coef./se
START	-0.008	-6.084***	-1.595***	-1.618**	-0.759**
	(0.039)	(1.646)	(0.505)	(0.674)	(0.303)
START∗ ln *Turnout*		1.223***			
		(0.369)			
START∗ ln *Blood*			0.256*		
			(0.133)		
START∗ ln *Volunteers*				0.104	
				(0.065)	
START∗ ln *Principal comp.*					0.075***
					(0.027)
STOP	0.064	3.750	1.075*	2.453*	0.761***
	(0.063)	(3.220)	(0.613)	(1.324)	(0.293)
STOP∗ ln *Turnout*		-0.692			
		(0.732)			
STOP∗ ln *Blood*			-0.126		
			(0.178)		
STOP∗ ln *Volunteers*				-0.191	
				(0.146)	
STOP∗ ln *Principal comp.*					-0.064
					(0.064)
START∗ ln *Population*		0.098**	0.093**	0.103**	0.103**
		(0.044)	(0.043)	(0.046)	(0.044)
STOP∗ ln *Population*		-0.095**	-0.083*	-0.111**	-0.100**
		(0.048)	(0.047)	(0.051)	(0.046)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.352	0.356	0.355	0.355	0.356
Obs.	1989	1989	1989	1989	1989

Note: The table presents the results of OLS estimates. Fixed effects for each 2-digit industry, each province, and each time period are included. The dependent variable is the change in log TFP, $\Delta\omega_{ijst}$. *START* is a dummy variable which equals one if a firm becomes foreign owned. *STOP* is a dummy variable which equals one if a firm becomes domestically owned. We use the following variables to measure civic capital: ln *Turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; ln *Blood* is the log of the number of blood donations per 1000 inhabitants in 2002; ln *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Principal comp.* is the first principal component of the above mentioned three proxies of civic capital. We also include as a control ln *Population*, which is the log of provincial population averaged over the period 1995-2003. Standard errors are clustered at the provincial level, in order to allow for correlation between observations located in the same province. ***,**,* denote significance at the 1%, 5%, 10% level, respectively.

Table 6: Robustness checks

	(1) GDP	(2) Provincial cov.	(3) Firm cov.	(4) No Milan	(5) Value added
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
START	-0.948**	-0.114	-0.881***	-1.006**	-0.758***
	(0.401)	(1.836)	(0.323)	(0.391)	(0.279)
START∗*Principal comp.*	0.060**	0.060*	0.075***	0.085***	0.070***
	(0.028)	(0.033)	(0.025)	(0.026)	(0.024)
STOP	0.991***	0.113	0.694***	0.972**	0.845***
	(0.378)	(2.997)	(0.266)	(0.413)	(0.287)
STOP∗*Principal comp.*	-0.048	-0.041	-0.071	-0.074	-0.023
	(0.066)	(0.058)	(0.060)	(0.061)	(0.036)
$START * \ln GDP$	0.092**				
	(0.041)				
$STOP * \ln GDP$	-0.094**				
	(0.041)				
$START * \ln Population$		0.077*	0.123**	0.142**	0.110***
		(0.041)	(0.048)	(0.059)	(0.041)
$STOP * \ln Population$		-0.061	-0.086**	-0.134**	-0.119***
		(0.075)	(0.041)	(0.067)	(0.040)
$START * \ln$ *University graduates*		0.116			
		(0.218)			
$STOP * \ln$ *University graduates*		-0.220			
		(0.250)			
$START * \ln$ *Length of trials*		-0.098			
		(0.209)			
$STOP * \ln$ *Length of trials*		0.113			
		(0.392)			
$\Delta \ln Workers$			0.054		
			(0.040)		
$\Delta \ln Capital$			-0.126***		
			(0.016)		
$\Delta \ln Skilled$			-0.111***		
			(0.032)		
R^2	0.356	0.356	0.390	0.362	0.492
Obs.	1989	1989	1989	1805	1995

Note: The table presents the results of OLS estimates. Fixed effects for each 2-digit industry, each province, and each time period are included. The dependent variable is $\Delta\omega_{ijst}$ in columns (1) - (4). In the last column, the dependent variable is $\Delta \ln VAW_{ijst}$, where *VAW* stands for value added per worker. *START* is a dummy variable which equals one if a firm becomes foreign owned. *STOP* is a dummy variable which equals one if a firm becomes domestically owned. Civic capital is measured by *Principal comp.*, which is the first principal component of the three direct proxies of civic capital. The included provincial controls are: $\ln GDP$ is the log of provincial gross domestic product averaged over the period 1995-2003; $\ln$ *Population* is the log of provincial population averaged over the period 1995-2003; $\ln$ *Length of trials* is the provincial log of the length, expressed in days, to complete a first degree trial averaged over the period 1995-2003. $\ln$ *University graduates* is the log of the share of provincial population holding a university degree in 2001. The included firm-level controls are: $\Delta \ln Workers$ is the log of the change in the total number of employees; $\Delta \ln Capital$ is the log of change in the capital stock of the firm; $\Delta \ln Skilled$ is the log of the change of skilled workers. Standard errors are clustered at the provincial level, in order to allow for correlation between observations located in the same province. ***, **, * denote significance at the 1%, 5%, 10% level, respectively.



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