Foreign ownership, firm performance, and the geography of civic capital *

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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 may 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 claim that the effect of foreign ownership on productivity is less favorable in areas where civic capital is low. As the level of local civic capital increases, the scope for opportunistic behavior is reduced, which makes the governance of foreign affiliates easier and improves their performance. We take this prediction to the data and find confirmation of our conceptual framework. Our analysis uncovers the importance of the geographic heterogeneity of informal norms and institutions in analyzing the nexus between foreign ownership and performance.

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

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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, 2007) 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 natural 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, internal transaction costs are a serious obstacle for the well-functioning of affiliates.

The final performance of foreign firms can be seen as the outcome of these two contrasting forces. Despite a large number of studies, a clear consensus on whether foreign firms do perform better than domestic ones has not been reached. 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 productivity. While there exists a well developed literature analyzing the determinants of foreign direct investment (FDI) location (Head et al., 1995; Wei et al., 1999; Basile, 2004; Du et al., 2008), to the best of our knowledge there is no paper in the literature assessing whether there is spatial heterogeneity in the productivity of foreign owned firms, and what are the driving forces. This is quite surprising. Conceding that FDI location is influenced by local factors makes it natural to ask whether returns to foreign investment differ across space. A suitable way to look at this issue is to investigate the behavior of a revenue-based measure of total factor productivity (TFP) in foreign owned firms.

Employing Italian firm level data, we show that the productivity effect of foreign ownership depends on the stock of civic capital in the area where the firm is located.[1] Specifically, in areas with a low endowment of civic capital the effect of foreign ownership on productivity is less favorable. On the contrary, as the stock of civic capital increases, so does the productivity 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 (Ichino & Maggi, 2000; Bloom et al., 2012). Foreign affiliates, in turn, are supposed to benefit more from this shield against overly self-interested behavior than purely domestic firms. The reason is that the geographically dispersed operations of MNEs and the resulting spatial separation of individuals within the MNE network enlarge the potential incidence of opportunistic behavior. For example, agency problems are likely to be exacerbated when the principal (shareholder) and the agent (local managers and employees) are located in different countries (Filatotchev & Wright, 2011; Jensen & Meckling, 1976). As a consequence, we expect that in areas where civic capital is low the disadvantages of foreign ownership are more severe, and performance worsens. On the contrary, the performance of an affiliate located in an area with

[1] We avoid using the somewhat loaded term of social capital. Rather, we adopt the concept of *civic* capital proposed by Guiso et al. (2011). We describe this concept in section 2.2.

a high endowment of civic capital is enhanced, as foreign investors encounter less problems of governance and assimilation.

Our estimation strategy rests on a two-stage approach. In the first stage we estimate a revenue-based measure of total factor productivity by the semi-parametric approach proposed by Levinsohn & Petrin (2003). In the second stage, we employ a first-differencing 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. We also allow for industry, province, and time-specific trends.

Focusing on Italy is particularly convenient for our exercise, because 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) and de Blasio & Nuzzo (2010), 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), Norway (Balsvik & Haller, 2010), and Sweden (Bandick, 2011). 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 norms and institutions, in particular the stock of civic capital, and shows that an adverse effect of foreign acquisitions on productivity can be found in some selected areas.

Second, the international business literature recently 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 related to bargaining, monitoring and maladaptation significantly reduce the affiliates' 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. Moreover, differently from them, we work out the role of the "civic environment" in which the affiliate is embedded for the determination of performance.

Two general caveats can be made on our analysis. The first point concerns the mode of entry of MNEs. They can enter a foreign market either through the construction of a new plant (greenfield investment), or by acquiring a certain amount of equities of an existing plant (brownfield investment).[2] In line with the bulk of the literature analyzing the effect of foreign ownership, this paper focuses on brownfield acquisitions, as in this

[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.

case it is easier to identify the direct impact of the ownership change on 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; Balsvik & Haller, 2010; Bandick, 2011) follow the firm up to few years after the acquisition. In this respect, our paper is not an exception, because 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.

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 main results, while section 6 discusses the robustness of the analysis and some extensions. In section 7 we do instrumental variable regressions. Finally, section 8 concludes.

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

2.1 The impact of foreign ownership on performance

2.1.1 Foreign ownership and performance: theoretical arguments

Several studies have addressed the issue of whether there is a performance gap between foreign and domestic firms, both theoretically and empirically. The main theoretical underpinning lies in the so-called internalization theory (Dunning, 1981; Caves, 2007), 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. A related argument suggesting a positive effect of acquisitions (both domestic and foreign) on productivity emphasizes the possibility to improve the match between the acquiring and the target firm, and to fully exploit the target's profit opportunities (Lichtenberg & Siegel, 1987).

Nevertheless, the rise in productivity due to foreign ownership can be counteracted by other factors. As the process of firm restructuring and reorganization prompted by the acquisition unfolds, there are obstacles that make the acquisition less favorable, at least in the short run. Harris & Robinson (2002) argue that "brownfield entry incurs costs through having to establish internal trust post-acquisition in the new organization, and through the cost of adapting the production facility of the acquired plant. Such costs are likely to be incurred in the immediate post-acquisition phase". In other terms, there are expenses (monetary and not) stemming from the effort to build mutual cooperation and trust between new foreign shareholders and local managers and workers, and from the need to coordinate and restructure the production process of the affiliate. Going deeper

into the origin of these costs, three interrelated determinants of transaction costs within large organizations in general, and multinational firms in particular have been stressed by the business literature (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 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, an appropriate incentive scheme is necessary which ensures that agents take actions which are consistent with the objectives of the firm.

The potential incidence of internal transaction costs is high in the case of multinational firms compared to domestic owned firms. The increase stems from two factors which affect each of the above mentioned areas. First, operating in different countries implies spatial separation of production facilities. This slows down the 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). In fact, local managers and workers generally have superior knowledge of the local business environment compared to the shareholder living in a different country (Filatotchev & Wright, 2011). The second factor are cultural differences among countries. This increases and further complicates the flow of information and knowledge among foreign affiliates and headquarters (Hedlund & Nonaka, 1993; Buckley & Carter, 2002). Communication failures are the result of diverse cultural backgrounds between the parent company and the affiliate, provided that workers in different countries have differing business codes and speak different languages. For all these reasons, we expect the incidence of governance costs to be particularly pronounced in foreign owned firms.

2.1.2 Foreign ownership and performance: empirical evidence

Given the contrasting forces that influence the operation of foreign affiliates, it is not surprising that the applied literature found mixed evidence on the productivity consequences of foreign ownership, with some papers ascertaining positive effects, even in the immediate aftermath of an acquisition, and others finding zero or even negative effects (see the review in Barba Navaretti & Venables, 2004). We now briefly discuss some of the more recent evidence in the literature concerning productivity, and, due to space constraints, we pass over other important effects such as those on wages and total employment.

Conyon et al. (2002) document for the U.K. an increase in the level and growth of labor productivity (measured as output per worker) in the year of a foreign acquisition. These results contrast with Harris & Robinson (2002), still for the case of the U.K., as 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.[3] Salis (2008) finds that acquired Slovenian firms in 1997 and in the two subsequent years do not outperform their domestic counterparts in terms of productivity. He motivates his finding with the fact that the acquisition carried out by the investing firm may be characterized by an asset seeking motivation: in this situation, MNEs undertake FDI in order to get access to technological assets held by the acquired firm, who has nothing to benefit from the change in ownership. Quantitative evidence of the importance of governance costs on MNE performance is provided in Tomassen & Benito (2009). Using 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 related to bargaining, monitoring and maladaptation. Balsvik & Haller (2010) analyze how TFP behaves when domestic plants are acquired by foreign investors in Norway. They find that TFP levels of plants subject to foreign acquisitions do not differ significantly from those of the reference group up to two years after the acquisition. Bandick (2011) carries out an analysis with respect to a sample of Swedish firms over the period 1993-2004. He finds that, over a four-year period, firms acquired by foreign entities undergo a positive TFP growth between 3 and 9 percent.

2.2 Civic capital, governance costs, and foreign firms

2.2.1 Civic capital and opportunism in intra-firm relationships

Relying on Guiso et al. (2011), we define civic capital as "those persistent values and beliefs that help a group overcome the free-rider problem in the pursuit of socially valuable activities". This definition highlights a negative relationship between civic capital and opportunistic behavior, as free-riding in collective endeavors is a genuine form of opportunism. Hence, by definition, in areas where civic capital is high individual opportunism is constrained by pro-social values and beliefs.

There is strong evidence about a negative link between the stock of civic capital in a given area and the incidence of opportunistic behavior in intra-firm relationships. Employing data from a large Italian bank, Ichino & Maggi (2000) analyze the determinants of shirking behavior among employees, defined as absenteeism and misconduct. They find that, ceteris paribus, shirking is more likely in branches in Southern Italy, compared to Northern Italy. The most important determinant for shirking behavior is the region of birth of the employee. Moreover, peer effects appear to be significant, provided that there is a positive relationship between shirking at the individual level and average shirking of coworkers in the branch. Since the South is on average endowed with less civic capital than the North, Ichino and Maggi interpret the results as supporting evidence for Putnam's notion that civicness hampers narrow-minded self interested behavior and improves collective outcomes. It is important to stress that, in their analysis, civic capital exerts a role in shaping the North-South shirking differential in two manners that are conceptually distinct. The first effect is through the influence on the values and beliefs of the individual worker, controlling for the composition of the rest of the workforce: since workers born in the South are more likely to work in the Southern branches of the bank, this contributes to higher

[3] 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.

shirking in the South. The second effect is through the influence on the values and beliefs of coworkers, keeping constant the worker's individual background: since it is in the Southern branches that is more likely to be surrounded by peers born in the South, this is an additional reason to expect higher shirking in the South, although it is quantitatively less important than the first in explaining the shirking differential.

Our approach is also related to Spagnolo (1999), where it is acknowledged that civic (social) capital is "an input for the production process, able to generate cooperation, effort in teams, productivity in organizations, and eventually growth". The basic idea of his theoretical framework (which can be seen as an extension of the standard model of collusion with multimarket contact) is that civic capital and social relations can sustain cooperation within teams in private organizations.

2.2.2 Other determinants of the firm-level degree of opportunism

Several studies have argued that some specific firm policies, such as team performance monitoring and incentive schemes, can enhance cooperation among firm members (see, for example, Rob & Zemsky, 2002). Unfortunately, due to the lack of data at the firm-level, we do not control for all these things that could possibly affect intra-firm relationships. The same is true for other idiosyncratic firm-specific factors that may arise in our framework, such as whether the acquisition was friendly or hostile.

However, from a purely quantitative point of view, there is a sense in the literature in which the provincial stock of civic capital might be more important than firm-specific corporate policies or corporate culture in shaping the success of foreign acquisitions. For example, Weber et al. (1996) found that, in international acquisitions, national culture differentials better predict the success of the operation than corporate culture differentials, where the term national culture refers to deep values and beliefs (e.g., degree of individualism), while corporate culture is defined as the attitudes and behaviors shared by senior managers regarding appropriate business practices. Bloom et al. (2012) show that the extent to which headquarters of MNEs delegate decision rights to affiliates is determined by the level of bilateral trust between the two countries. We believe that the concept of civic capital plays a role in foreign acquisitions similar to the national culture differential. Nonetheless, our analysis makes a step forward because we claim that, even within the same destination country (Italy), the spatial variation in deep cultural traits at a detailed spatial scale is big enough to cause a considerable variability in foreign firms performance.

2.2.3 Testable predictions

In the case of vertical FDI (i.e., FDI aimed at offshoring some phase of the production process) MNEs expand abroad through foreign acquisitions whenever market agreements with foreign producers are too costly or too risky. 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. While the internalization of operations through foreign affiliates mitigates transaction costs inherent in arm's length relationships, there are costs of governing the various activities within the MNE that increase. We have discussed the sources of these

costs in section 2.1. In the case of horizontal FDI (i.e., FDI aimed at replicating abroad the entire production process) MNEs expand abroad through foreign acquisitions whenever exporting is less profitable than FDI. This happens when barriers to trade are large. But also for this type of FDI the post-acquisition governing of foreign subsidiaries is subject to the same serious obstacles.

In each type of relationship where the potential incidence of governance costs rises (information and knowledge processing, tasks coordination, personal goals coordination) civic capital plays a mediating role, that mitigates the potentially adverse effect of foreign ownership. The flow of information and the sharing of knowledge between the parent company and the Italian affiliate is smoother where civic capital is high, as agents are less opportunistic and they avoid making a strategic use of information. Moreover, since civic capital hampers narrow-minded self-interested behavior in collective endeavors we also expect that the coordination of tasks either with headquarters or within the affiliate is easier. Finally, there is also a congruence effect of civic capital on the personal goals of employees on the one side and the MNE corporate objectives on the other, because the attitude to cooperate in favor of collective endeavors is more intense in foreign owned plants located where civic capital is high. Consequently, the main testable hypothesis of our framework is the following.

Prediction 1. *The actual rise in governance costs due to foreign ownership should be stronger where civic capital is low. This implies that the effect of foreign ownership on productivity is less favorable in areas where civic capital is low. As the level of local civic capital increases, the scope for information, coordination, and monitoring hazards is reduced, making the governance of foreign affiliates easier and improving productivity.*

In Figure 1 we propose a simple scheme to exemplify the conceptual framework we have in mind.

[Insert Figure 1 about here]

As discussed before, the theory of MNE activity predicts that, upon a foreign acquisition, managerial and organizational know-how is transferred from the parent company to affiliates. We also provide a direct test of this fact, relating it to the level of civic capital in the following manner.

New managerial and organizational practices are among the valuable proprietary assets that are transferred from the parent company to the foreign affiliate upon a foreign acquisition. These assets are characterized by a strong degree of intangibility and specificity, in terms of skills and informal routines held by MNE employees, that make it difficult to sell or contract upon them (Caves, 2007). This is exactly the reason why the MNE finds it advantageous to exploit these assets in the context of a foreign investment, that guarantees common ownership, instead of an arm's length transaction (sale or lease) of this know-how with a foreign plant that maintains independence.

Because of intangibility and specificity, the extent to which these new practices are absorbed and implemented in the subsidiary comes to depend on the same factors that affect governance and assimilation costs, namely the need for information and knowledge flows, tasks coordination, and congruence in the agents objectives. The know-how required for the new managerial arrangements diffuses more easily from headquarters to employees if civic capital is high, as agents are arguably less prone to make a strategic use of information. In

addition, civic capital hampers narrow-minded self-interested behavior in collective endeavors, and this facilitates the affiliate reorganization of tasks. Finally, civic capital favors the congruence of personal goals of local managers and employees on the one side and the MNE corporate objectives on the other, and this is another factor that allows to put into effect managerial innovations, since employees are presumably more eager to pursue the goals of the new owners. Summing up, in areas where civic capital is low, the effective transmission and implementation from headquarters to affiliates of new managerial-organizational practices is hampered. On the contrary, it should be easier to adopt them where civic capital is high.

Prediction 2. *The implementation of managerial-organizational improvements due to foreign ownership is more likely in areas where civic capital is high. As the level of local civic capital decreases, the scope for information, coordination, and monitoring hazards is increased, making more cumbersome the adoption of this type of MNE proprietary asset.*

A last important qualification concerns the timing of managerial improvements. It is reasonable to believe that the transfer and the implementation of new organizational practices does not happen immediately after the acquisition is finalized, but instead takes some time to materialize. We are going to take this into account in our empirical analysis.

3 Data description

3.1 The UniCredit Survey

We work with the 7th (1995-1997), 8th (1998-2000), and 9th (2001-2003) waves of "*Indagine sulle imprese manifatturiere*" (the Survey of manufacturing firms). This survey was carried out by Mediocredito Centrale, now part of UniCredit Group, one of the largest Italian banks.[4] Each wave covers three years. Overall, the time span that we consider ranges from 1995 until 2003. Moreover, we complement this core data set with the 10th (2004-2006) wave to retrieve the one period lead of the managerial-organizational innovations variable for firms that are sampled both in the 9th and 10th waves (a time period is the three-year interval covered by each wave).[5]

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 but 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 Bureau van Dijk's AIDA

[4]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).

[5]We will be more specific about this variable in section 6.4.

data set, enabling us to work with a rich firm-level data set.[6]

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, in the baseline analysis we classify a firm as foreign owned if at least 10% of the equities is held by a single foreign person. In the paper, we also consider other thresholds (30% and 50%, respectively) for the identification of foreign ownership, to check whether our results are sensitive to the particular share chosen. In the data set firms can experience the following two changes in ownership status over time: they can start being foreign owned when the equities held by a foreigner exceed a certain threshold (be it 10%, 30% or 50%, we call this a *start* event); they can stop being foreign owned, thus becoming domestic owned, when the amount of equities held by a foreigner goes below the 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).[7] Some firms are always domestic over the observed lapse of time, while others are always foreign.

After removing outliers we end up with an unbalanced panel of approximately 1600 firms.[8] Calculating first differences gives 1954 observations. As to the events that characterize the change in ownership status in our data set, with a threshold set at 10% to identify foreign ownership, we have 73 start events, and 40 stop events. The number of firms experiencing a start-stop pattern is 16. Table 1 provides descriptive statistics for some firm-level 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

[6] See Appendix 9.1 for a detailed description of the firm-level variables employed in our analysis.

[7] 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.

[8] The trimming procedure that we adopt is explained in Appendix 9.1.

rate).[9] The capital stock shrinks by 24%, while TFP goes down by 37%.[10] In the case of a start event, the only measure which seems not to be negatively affected by the change in ownership is firm size, proxied by the total number of workers. Turning to the stop events, they show the same negative pattern, 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 firms involved in some way in operations with a foreigner (i.e., starters, stoppers, or always foreign) outperform their domestic counterparts in terms of size and productivity. 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. 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 or "cherry picking" (see Harris & Robinson, 2002; Balsvik & Haller, 2010, and references therein). Also not new is the fact that, even if foreigners buy "better" firms, 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 sample experience a decline in productivity of roughly 40%.[11]

The last piece of evidence that we provide concerns the geographic distribution of the events related to foreign ownership status. In panel (a) of Figure 2 we plot the total number of start events by province over the 9-year period. In panel (b) we plot the total number of stop events. It is apparent that foreign acquisitions and foreign divestments are concentrated in the Northern part of the country. We discuss below what are the implications of this pattern for our analysis.

[9] Remember that information about ownership is provided for the last year of each wave. Let us consider an example to clarify the data structure and show some limitations associated to it. If a firm is classified as foreign owned in 2000, but was not so in 1997, we call this a start event. We do not know whether the actual ownership change took place in 1998, 1999 or 2000. However, since we compute the variation in performance between 1997 and 2000, we are sure that the initial year of the performance measure (1997) is a point in time before the change in ownership, and the final year of the performance measure (2000) is either a point in time after the change (if the change happened in 1998 or 1999) or at most contemporaneous to it (if the change happened in 2000). This implies that we are relating variations in performance over a three-year interval to events of foreign ownership whose duration is indeed random (two, one or even zero years). This is a source of measurement error. In an ideal setting we would like to relate the 1997-2000 variation in performance to an event of foreign ownership of fixed length, or, alternatively, we would like to know exactly when the change in foreign ownership occurred in order to normalize variables accordingly.

[10] We will explain how we measure TFP below.

[11] The magnitude of the decline is so severe that other factors could be at work, beside governance and assimilation costs narrowly defined. For example, if some machinery is replaced after the foreign acquisition, in the context of the affiliate restructuring, this will provoke a halt of production, and a decrease in output and measured productivity. Unfortunately, it is very hard to take into account factors like this in our analysis, due to the lack of appropriate data.

3.2 Measurement of civic capital and of other explanatory variables

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 (per 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.[12] Second, there are neither financial nor legal incentives to pursue these activities. Hence, the reason why individuals vote, donate blood or engage in volunteering is that they have internalized some common social norm for which they are disposed to incur costs in view of the fulfilment of a socially valuable interest, without receiving any material compensation. In section 2 we 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.[13] In this manner we get a regressor capturing 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 3, 4, and 5 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 6 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. In the analysis we make use of an historical instrument for current civic capital in the context of an instrumental variable regression. We pick the average length of communal independence during the Middle Age of cities belonging to a given province. Putnam et al. (1993) argue that an important role in explaining the huge differences in the endowment of civic capital across Italian regions is played by free-city states experience in the Center-North of the country hundreds of years ago. We further justify the choice of this variable below.

[Insert Figures 3, 4, 5, 6 about here]

The comparison of Figure 2 and Figure 6 unveils the strong spatial correlation between the events related to changes in foreign ownership and civic capital; that is, the provinces with a higher stock of civic capital are also

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

[13] In Appendix 9.2 we review how to compute the first principal component.

more likely to host a start or a stop event. If it were possible to argue that changes in foreign ownership are randomly assigned across firms in the Italian peninsula, the spatial pattern of FDI would not be problematic for the identification of the effect on productivity. We discuss below why working in first differences increases the plausibility of exogeneity (or randomness) of foreign ownership. Moreover, we will also discuss the direction of any remaining bias that survives differencing.

In Table 2 we also show the correlation coefficients with provincial controls such as population density, GDP, corruption, university graduates and the measure of the average length of trials.[14] In the baseline regressions we always include population density, because there could be positive density externalities that boost firms' productivity (see, for example, Ciccone & Hall, 1996). In particular, denser areas may provide better infrastructure and gains due to labor pooling. Conversely, the sign of the externality could also be negative, because population density may also raise congestion, thus lowering productivity. GDP is another candidate variable to proxy for the intensity of economic activity in the local area, and is included in the robustness checks. Another determinant of the intensity of the productivity effect of foreign acquisitions could be corruption, which is known to discourage FDI (Wei, 2000). Actually, foreign firms performance may deteriorate in areas where corruption is strong. Corruption is measured through a provincial index for Italy, developed by Golden & Picci (2005), representing the ratio between what public authorities cumulatively have paid for local public infrastructure and the physical quantities of infrastructure that exist. The higher it is the ratio of expenditures over existing infrastructure, the larger it is corruption. The variable university graduates controls for the stock of human capital accumulated at the local level, which may affect the performance of firms in general, and that of foreign affiliates in particular. Finally, the length of trials aims at capturing the efficiency of legal enforcement, which is often blamed to play an adverse effect on the business environment in Italy, see Istat (2006).

In Table 3 we provide the full set of descriptive statistics for some of the variables employed in the paper, both firm-level and provincial.

[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.[15] Our main performance measure is TFP. 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

[14] Appendix 9.1 provides an exact description and the sources used to compute all these variables.

[15] 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.

estimating separate production functions for each 2-digit NACE industry.[16] The generic production function in industry s is

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

where y_{ijst} labels the log of value added (revenues minus input expenditures other than labor) of firm i in province j in industry s at time t. 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.[17] 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 is computed for each firm in the industry in each year. As explained in Foster et al. (2008), we are well aware that our measure of TFP, which is based ultimately on revenues and some input expenditures, and not on physical output or physical inputs, is genuinely correlated with technical and organizational efficiency, but also reflects other idiosyncratic firm-specific factors, such as the firm's input and output prices.[18] For this reason, our TFP is indeed a measure of overall profitability, with pure productivity being one of the components. This fact bears little consequences to the relevance of our analysis, provided that interpreting our paper as an attempt to discover the sources of foreign firms profitability is equally interesting, even if one cannot attribute revenue productivity entirely to technical and organizational efficiency.

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

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

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. Civic capital in province j where firm i is located is labeled 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 some provincial covariates. In the baseline equation we use the log of population density in a given province, labeled $\ln Pop_j$, to control for the heterogeneity of the effect of FO in provinces with different density of economic activity. In the robustness checks we use a wider array of provincial characteristics. 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 density were zero (there are no such provinces in our data set). The key parameter of interest, α_2, indicates how foreign ownership affects productivity as civic capital increases. The parameter α_3 informs

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

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

[18] The only two inputs measured in physical units are the number of skilled and unskilled workers.

us about how foreign ownership affects productivity as population density 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; η_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.[19] We think that this assumption is well-suited to capture the behavior of productivity at the firm level, because it assumes strong persistency in the idiosyncratic factors that influence TFP.

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 of foreign ownership 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 public 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 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 (see, for example, 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. Again, if during the estimation procedure this term is not removed and goes into the error term, the OLS estimates will be biased.

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 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 province and industry-specific effects, respectively, and derive from the time trends of equation (2).[20] 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.

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

[20] Adding an intercept β_0 or not to our equation in first difference 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.

This assumption is satisfied under strict exogeneity; that is, $E(\epsilon_{ijst} \mid \mathbf{FO}_i, \eta_i) = 0$, where $\mathbf{FO}_i$ is the vector of FO_{it} for all t's.[21] In this case the OLS applied to (3) are consistent. The fact that ϵ_{ijst} follows an AR(1) process with ρ close to one guarantees that $\Delta\epsilon_{ijst}$ is approximately a white noise, and estimation by first differencing is efficient. 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.[22] 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 domestic or foreign owned. Notice that from the estimation of the model in first differences 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 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 estimates can also be interpreted in terms of the relationship between the level of productivity and foreign ownership. This explains why in the paper we talk interchangeably of the effect of foreign ownership on performance and of the effect of the change in foreign ownership on performance.

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 post-acquisition governance 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 variation in performance after a start event (when a foreign investor comes in) to be worse 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 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:

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

[21] When foreign acquisitions ($FO_{it} = 1$) follow positive shocks to the error term ($\epsilon_{ijst-1} > 0$) the assumption fails. Wooldridge (2002) p. 285 suggests a simple regression to test whether this is the case or not. In our context this amounts to estimating the following equation:

$$\Delta\omega_{ijst} = b_0 + a_1\Delta FO_{it} + a_2 FO_{it} + \gamma_t + \gamma_j + \gamma_s + e_{ijst}.$$

If a_2 is not statistically different from zero we can be confident that foreign acquisitions are uncorrelated to past realizations of the error term ϵ_{ijst}, and this is actually what we get (the regression estimates can be found in the online supplementary material).

[22] 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).

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 productivity.

Figure 7 is a box plot which 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.[23] 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.[24] Again, the decline in performance is larger for starters than for stoppers for each subset of provinces (high civic capital and low civic capital). This comes as no surprise, given that after a start event owners have to operate the firm 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. In terms of 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). This is in line with what we expected, given that the cooperation-enhancing effect of civic capital helps foreign investors in the aftermath of a start event to overcome the difficulties associated with the change in ownership.

[23] 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.

[24] 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 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.

[Insert Figure 7 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. This exercise aims at assessing the average impact of the foreign ownership change, irrespectively of the degree of civic capital and of other covariates 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.[25] Finally, Balsvik & Haller (2010), under several specifications and samples, find that plants subject to foreign acquisitions do not have TFP levels that differ significantly from those of their reference group, which contains domestic plants not belonging to MNEs. Summing up, the estimates show that the average effect on TFP of foreign ownership in the short run is not statistically different from zero. The contribution of our paper to the literature consists in providing estimates for the effect of foreign ownership based on a geographical stratification. We believe that estimates of the average effect across local areas, like in column (1) of Table 4, hide substantial geographic heterogeneity. For this reason, we single out the role of local informal norms and institutions (i.e., civic capital) in shaping the performance of foreign firms.

We now present the 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. Column (5) displays the regression when civic capital is measured by the first principal component of the three variables. In all these columns, the log of provincial population density, interacted with the change in the foreign ownership dummy (ΔFO), controls for density externalities affecting 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 density and civic capital are zero, firms which become foreign owned ($\Delta FO = +1$)

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

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 intra-firm 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.[26]

We also get a highly significant coefficient for the interaction of ΔFO and the log of population density. This means that the productivity growth differential of foreign firms with respect to firms not changing ownership status is larger in more densely populated areas. Foreign firms benefit more from denser areas than firms not changing ownership. Several factors can explain this result, and pinning down exactly the sources of these externalities is beyond the scope of our paper. The broad picture seems to be that foreign firms rely more on good infrastructure and specialized workforce, hence they benefit from being in denser areas, where these factors are abundant. The costs of congestion due to a higher population density are more than offset by the benefits. All in all, it is reassuring that the effect of civic capital survives the inclusion of the interaction of ΔFO with population density, since it signals that we are not capturing a spurious correlation.

In column (6) and (7) we introduce separately the interaction of ΔFO with civic capital and population density. Column (6) shows that, without controlling for density, the coefficient on the interaction with civic capital is not statistically different from zero a the 10% level (the p-value is equal to 0.16). A reason is the increase in the standard error of the estimate, from 0.029 in column (5) to 0.038 in column (6). Column (7) shows that the interaction of the change in ownership with population density taken on its own remains statistically significant.

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 between the start and the stop events. As before, we first estimate the simplified version of our model, where all interaction terms are dropped. The point estimates in column (1) of Table 5 indicate that, immediately after a start event, firms experience a lower TFP, while a stop event is associated with an increase in TFP, compared to the case where no ownership change occurs.[27] Evidence is quite weak, because coefficients are not statistically

[26] 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).

[27] 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 7: 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 coherent with the specification of equation (3), where we assume 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 29 on this issue.

different from zero.

[Insert Table 5 about here]

Each column from (2) to (5) in Table 5 corresponds to an interaction with a different civic capital variable. Consider first the case of the switch into foreign ownership ($START$). The estimate for δ_1 is negative. Hence, a switch into foreign ownership brings productivity down if civic capital and population density are 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 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 largest value of the distribution of civic capital in provinces that host at least one start event over the 9-year period of observation.[28] Unless otherwise stated, the log of provincial population density is always fixed at the sample mean (equal to 5.144). 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 -.374 (first quartile of the distribution of provinces with some start event), the marginal effect of the ownership change is negative, reaching -.138. To see whether this value is statistically different from zero, we perform an F-test on the linear restriction $(\delta_1 + \delta_2 \times -.374 + \delta_5 \times 5.144) = 0$ and find that we can reject the null hypothesis that the linear restriction equals zero at the 5% level (p-value equal to 0.027); that is, the decrease in productivity growth associated with a start event is statistically different from zero at the 5% level. If we plug in the linear restriction the true value of the population density of Rome we get a marginal effect equal to -.030, which is not statistically different from zero at the 10% level. Hence, we can conclude that if Rome had not been such a densely populated area and had had just the median value of population density, the post-acquisition performance of foreign firms would have been undoubtedly negative due to the relatively low stock 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 .872). In this case, evaluating the marginal effect at the mean level of population density, we get a value of -.047. 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 2.207) we find a positive point estimate of the marginal effect of civic capital equal to .050, 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 total effect of foreign ownership on productivity is negative (with population density fixed at the median level). This negative sign is statistically different from zero at the 5% level in the case of provinces with a relatively low level of civic capital. The main contribution of our paper is to show that a key determinant of foreign firms productivity 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

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

not statistically different from the one of firms which do not display any change in ownership. According to our conceptual framework, in this 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 density 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.[29]

Regarding population density, the change to foreign ownership (start event) enhances productivity more in densely populated areas than in sparsely populated areas. The change to domestic ownership (stop event) exhibits the opposite pattern, since firm productivity benefits more where population is scattered around. Again, the picture is consistent with a situation where foreign firms rely more on factors available in dense areas (e.g., infrastructure, specialized workforce). Domestic businesses can be thought to be more sensitive to the congestion costs of densely populated areas, and for this reason their productivity improves as density shrinks.

6 Discussion, robustness, and extensions 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 ownership change into account when deciding where to invest. Given that civic capital decreases governance costs, we may have a non-random selection 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 relatively higher chance of landing up

[29] 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.

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 high growth rate of the capital stock (thanks to high investment) or size, and that these factors have an impact on subsequent productivity. In the robustness analysis we deal with this issue.

Finally, consider the following problem. Since we expect property right protection to be good and contractual incompleteness to be low where civic capital is high, it is more likely that MNEs will opt for arms length transactions with firms in these provinces, instead of vertical FDI. By the same token, vertical FDI should be more likely in low civic capital provinces. This could induce empirically a negative correlation between the occurrence of foreign acquisitions of the vertical type and civic capital, leading to a selection bias if firms that are target of vertical FDI (and that for this reason are clustered in low civic capital provinces) are idiosyncratically different in terms of productivity dynamics with respect to other firms. It is difficult to give a precise sign to this potential bias, because it is not clear a priori whether vertical FDI firms perform inherently "better" or "worse" in terms of TFP. Together with the fact that in the case of horizontal FDI there is not an obvious correlation between civicness in the local area and the occurrence of foreign acquisitions, this makes us confident that results are not substantially affected.

6.2 Robustness to other definitions of foreign ownership

We now check whether the results are robust to different definitions of foreign ownership. The first change consists of considering a firm as foreign owned when at least 30% of the equities are held by a foreign person. The second change is to consider as a threshold the 50% share. The idea is to focus only on switches in ownership that are associated with a relevant modification of property rights, since these are the events which are most likely associated with a substantial change in the governance of the firm. Columns (1) and (2) of Table 6 show that the results are robust to the change in the threshold for foreign ownership.

In column (3) we introduce a continuous variable of the change in foreign ownership status. To do so, instead of employing a dummy variable equal to one when the share held by a foreign person is above a certain threshold and zero otherwise, we use the total share held by foreigners. This implies that in the specification in first differences we employ the change in the total share held by foreigners (a continuous measure) to proxy the risk of experiencing governance and assimilation costs. The results show that the interaction of the change in foreigners' share and civic capital is positive and statistically different from zero. The economic interpretation is slightly different in this case, and provides a deeper result than the one obtained in the baseline analysis,

because we can conclude that also the intensity of the ownership change matters, with firms subject to a larger acquisition being more sensitive to civic capital than firms subject to a smaller acquisition. This is coherent with our conceptual framework, because larger changes in ownership are more likely to foster larger reorganizations which in turn increase the incidence of governance and assimilation costs on productivity.

In column (4) we introduce two separate continuous variables: *Increase foreign share* is the absolute value of the increase in the foreign share; *Decrease foreign share* is the absolute value of the decrease. Results are consistent with our previous findings.

6.3 Other robustness and sensitivity checks

In Table 7 we perform some other robustness checks. In column (1) we test the robustness of the interaction term between foreign ownership and civic capital to the inclusion of an interaction between foreign ownership and a measure of corruption at the provincial level. Table 2 shows that, from an empirical point of view, civic capital is highly correlated with corruption, because provinces with more civicness are also those that turn out to be the least corrupted according to the Golden-Picci index. Indeed, it is possible to argue that corruption is endogenous to civic capital. This notwithstanding, we think that it is instructive to show what happens when we have both variables in the same equation, because they capture features of the local business environment that are conceptually distinct. By now it should be clear that civic capital is a way to evaluate accurately the incidence of opportunistic behavior in intra-firm relationships. Instead, the attitude toward corruption reveals the extent to which public authorities misuse their power, and this affects the relationship between the firm and public authorities more than intra-firm interactions. Moreover, in the Golden-Picci index outright fraud and illegal monetary transactions regarding public infrastructure spending are indistinguishable from pure waste, inefficiency, and mismanagement. In other terms, the corruption index is also a measure of the efficiency of local public institutions. Estimates show that, even after controlling for corruption, civic capital remains statistically significant at the 10% level. The intensity of corruption in the local area seems to play no role. This may be the case if corruption or, more generally, inefficiency of local public authorities harm domestic and foreign firms equally.

In column (2) we measure the size of the local market by provincial gross domestic product instead of population density.[30] There is a decrease in magnitude but the coefficient is still statistically different from zero. We prefer including population density in the baseline specification instead of GDP as a control. The reason is that we think that provincial GDP is more likely to be an outcome of civic capital than population density. In this sense, following Angrist & Pischke (2009), it is a "bad control" provided that its inclusion may induce a selection bias.[31] A source of bias is the following. When controlling for GDP, the estimation of the

[30] We average gross domestic product for each province over the period 1995-2003.

[31] Algan & Cahuc (2010) and Tabellini (2010) show that civic capital boosts GDP growth. Also population density may be related to the stock of civic capital, if we assume some mechanism under which intense social interaction (due to high population density) facilitates the development of civic virtues. However, the fundamental difference is that while GDP is more likely to be an outcome of civic capital, population density is more likely to be predetermined with respect to it. And it is preferable to have controls that are not outcomes themselves of the regressor of interest (see again Angrist & Pischke, 2009).

coefficient on civic capital comes out from a comparison of foreign firms in provinces with a high GDP and a low level of civic capital with foreign firms in provinces with both high GDP and high civic capital. The former firms (in the high GDP and low civic capital area) benefit probably from some unobserved features that improve TFP dynamics, which are the same factors explaining why, notwithstanding a low civic capital, the area scores a high GDP. If this is true, we expect a downward bias for the interaction term of ΔFO and civic capital, and this is what we get from our estimates.

In column (3) we control for a wider array of provincial controls. In addition to the interaction with population density, we introduce the interaction of ΔFO with the logarithm of the share of university graduates at the provincial level, and with the logarithm of the length of trials in civil affairs. The results show that the interactions with the controls are not statistically different from zero. The point estimate of α_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 their standard errors, and with the endogeneity of a regressor such as the length of trials, which bias downward the estimate of α_2.[32] The large change in the coefficient of the main term, corresponding to α_1 in equation (3), is not due to misspecification but it reflects that the coefficient has to be interpreted differently, since it represents the marginal effect of the change in foreign ownership when all the other covariates (civic capital, and the logarithms of population density, university graduates and length of trials) are zero.

In column (4) we include firm-level controls into the productivity regression, such as the one-period lag of the growth rate of size (in terms of workers), of the capital stock, and of the number of skilled workers. The inclusion of lagged growth rates 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 high investment rate (and a high growth of the capital stock). If investment has an effect on productivity growth in the next period, its omission may induce a bias. We present results where we introduce an array of firm-level controls plus their interaction with civic capital. The estimates show a limited sensitivity to the addition of these variables.

Next, in column (5) we exclude observations located in Milan, the province with the largest number of changes in foreign ownership. Results reveal that they are not driven by this province.

In column (6) we reduce the sample to include only provinces with at least two start events and two stop events. Since in many provinces there is only one change in foreign ownership (be it start or stop), the idea is to show that our results are not driven by them. We end up including the following local areas: Turin, Milan, Bergamo, Verona, Modena and Naples. The point estimate of the coefficient on the interaction between civic

[32]Despite the same legal origin and identical formal laws in each province, stark differences exist in the effectiveness of law enforcement (proxied by the length of trials) across Italy. An explanation could run as follows. Where civic capital is low opportunistic behavior is widespread, so that people tend to sue more frequently others. This creates congestion in the judicial system in areas with low civic capital. Correlation coefficients of Table 2 between civic capital and length of trials confirm this. In the case of Mexico, Laeven & Woodruff (2007) attribute the geographic differential in the effectiveness of legal enforcement (measured with an index based on interviews with 519 lawyers) to the prevalence of indigenous population one hundred years ago, or to the production of agricultural crops with high economies of scale in 1939.

capital and the change in foreign ownership is still statistically significant. However, the magnitude is reduced.

In column (7) we exclude from the sample firms that are always foreign over the three waves. Results do not change.

6.4 Other firm-level outcomes as dependent variable

The main objective of this paper is to analyze whether the effect of foreign ownership on productivity depends on the stock of civic capital of the local area where the firm is located. At the same time, there could be other firm-level outcomes that are affected in a similar way. In section 2.2.3 we discussed why civic capital could impact on the adoption of firm-level managerial-organizational innovations that are expected to follow a foreign acquisition. The UniCredit Survey allows us to look into this, since there is a question about the adoption of managerial-organizational innovations during the three-year period covered by a given wave.[33] The survey explicitly relates managerial-organizational innovations to other two types of innovations: product and process innovations. Firms are asked whether they performed managerial-organizational innovations linked to product or process innovations. Regrettably, in this way the question is narrowing the scope of these managerial-organizational improvements, and is also introducing a confounding factor (whether the firm performed or not a product or process innovation). We correct for this issue by estimating a specification where we condition managerial-organizational innovations linked to product or process innovations to the actual occurrence of a product or process innovation. Another important issue is to establish the exact timing of managerial innovations to look at. It is reasonable to believe that improvements to managerial practices take some time to materialize. We try two different exercises. In the first we look at the one period lead of episodes of managerial innovations, with respect to the time of the ownership change. For example, if a firm becomes foreign owned during the 9th wave (2001-2003), we consider whether a managerial-organizational innovation is adopted in the 10th wave (2004-2006). This introduces a more demanding requirement in terms of data availability, because in this kind of exercise a firm has to be surveyed for at least three consecutive waves (in the example, the firm needs to be surveyed in the 8th and 9th waves to record the change in foreign ownership, and in the 10th wave to record the one period lead of the managerial innovation variable). Given the rotating structure of the panel (in each wave some firms are dropped from the sample and replaced with other new firms) we are left with fewer observations than in the baseline regressions. The second exercise looks at managerial innovations that are contemporaneous to the change in foreign ownership. For example, if a firm becomes foreign owned during the 9th wave (2001-2003), we study whether it reports to have adopted a managerial innovation during the same period of time. Since estimates from this second exercise are never statistically different from zero, we omit them in what follows to save on space and we concentrate only on the one period lead of the variable of interest.

In columns from (1) to (4) of Table 8 we present the estimates of a probit model where the dependent variable is equal to one if the firm adopted a managerial-organizational innovation in the wave subsequent to the one where the change in ownership happened, and zero otherwise. The managerial-organizational change is linked

[33] In Appendix 9.1 we describe the question.

either to process (columns (1) and (2)) or to product innovations (columns (3) and (4)). Estimates are obtained either conditioning on the presence of a process or product innovation (columns (1) and (3)) or not (columns (2) and (4)). The introduction of the control for the process/product innovation clarifies the interpretation of the effect of foreign ownership. Conditioning on the fact that the firm undertakes a process innovation, we are left with evidence that foreign firms in a high civic capital area are more prone to implement also a reorganization related to this innovation, while firms located in a low civic capital area are less prone to it (even when they innovate the production process). This can be explained by the presence, in areas where civic capital is low, of obstacles to information and knowledge flows, tasks coordination, and congruence in the agents' objectives, that are crucial for the effective transmission and implementation of new managerial-organizational practices within the MNE. The magnitude of the marginal effect of the interaction between the change in foreign ownership and civic capital on the probability to adopt the managerial improvement in column (1) is equal to 0.176, if we evaluate all other regressors at their means. The effect is sizeable. The chance that a firm switching into foreign ownership in Milan (principal component equal to +1.236) adopts a managerial-organizational innovation is 28 percentage points higher than in Rome (principal component equal to -0.374).

Turning to managerial-organizational innovations related to a product innovation, the interaction term between the change in foreign ownership and civic capital is not statistically significant, although the coefficients have a positive sign.[34] All in all, the evidence concerning the implementation of managerial-organizational improvements reinforces the broad picture coming out from our analysis. On the one side, in our baseline estimates we get a more favorable dynamics in terms of TFP for foreign firms located in high civic capital areas. On the other side we get that, over the time interval corresponding to the wave following the one where the change in foreign ownership occurs, these firms are more prone to improve their managerial practices. This may eventually magnify their productivity advantage.

Finally, in column (5) of Table 8 we measure firm performance in terms of labor productivity (value added per worker). This is a variable closely related to TFP. Results are robust to this change in the measurement of the dependent variable.

7 Instrumental variable estimates

In Table 9 we present the results of two-stage least squares estimates, obtained employing a historical variable as instrument. While our econometric specification in equation (3) is appropriate in addressing firm-level idiosyncracies, it is less effective in solving problems of reversed causation. In particular, OLS estimates assume that the stock of civic capital is not affected by TFP dynamics. To the extent that the values and beliefs of the local population that account for civic capital are influenced by economic development and well-being prompted

[34] A process innovation differs from a product innovation in terms of reorganization intensity. A larger number of managerial innovations is at stake in a process innovation, making it easier to identify the impact of civicness. There is evidence that process innovation is more systemic in nature, as it puts together several actors, while product innovation tends to be more self-contained (Damanpour & Gopalakrishnan, 2001). Therefore, a process innovation is associated with a potentially larger number of changes to the organizational and administrative structure and this facilitates identification.

by firms productivity, we face endogeneity problems due to reversed causality. Similarly, to the extent that there are other variables not captured by our controls but relevant for the analysis, our estimates might be subject to an omitted variables bias.

To address these problems we perform a two-stage least squares instrumental variable (IV) regression in which we instrument provincial civic capital by the average length (in years) of communal independence during the Middle Age of the cities belonging to the province. We take this information from Guiso et al. (2008a). The authors collect historical data at the town level for the 400 biggest cities in terms of population in 1871 for the Center-North of Italy. They confine data collection to this area because free-city states were a peculiarity of this part of the Italian peninsula. Cities in the South never experienced communal independence due to the presence of kingdoms of Norman descent.[35] We use city-level data to compute a provincial weighted average of the length of independence: the number of years of independence of individual cities in a province is weighted by city population in 1871, also provided in Guiso et al. (2008a).

Instrumenting today's stock of civic capital by the length of communal independence entails several advantages. First, we have good reasons to believe that this historical variable has predictive power on the current stock of civic capital and is therefore a strong instrument. The communal republicanism that emerged from the 12th century in Central and Northern Italy was a kind of self-government based on strong horizontal ties and civic commitment. Putnam et al. (1993) emphasize that communal independence was crucial for the formation of civic capital, and it eventually explains the pronounced geographic disparities in current civic capital across Italy. Testing Putnam's conjecture, Guiso et al. (2008a) empirically show that communal independence of Italian cities has increased their current stock of civic capital. The strength of the instrument is also predicted by theoretical models. In fact, several papers stress the persistence of civic capital over long periods of time, including several centuries, highlighting the crucial role of intergenerational transmission of values and beliefs from parents to their offspring (Tabellini, 2008; Guiso et al., 2008b). For these reasons, we believe that the length of communal independence is a strong instrument for today's civic capital.

Second, given the huge time lag of roughly 800 years we are confident that the instrument is truly exogenous in our context. In particular, we believe that it is exogenous in the first stage regression. At the same time, the instrument has to satisfy the exclusion restriction in order to be valid. This requires that, conditional on the other regressors, the length of communal independence has an effect on TFP dynamics only through the current stock of civic capital. We acknowledge that this is questionable in some way. In fact, it is not implausible that communal independence during the Middle Age has spurred TFP growth in foreign firms through channels other than the formation of civic capital. To some extent, our specification mitigates these threats as it allows for province fixed effects. They absorb any direct effect of the business environment on TFP growth, independently of ownership status. However, we are aware that this cannot be a definite proof that the exclusion restriction

[35]There are two facts that make us confident that the sample of 400 cities is representative of the history of the universe of Italian towns in Center-North. The first is that, in terms of provincial population in 1871, these 400 towns, on average, make up 45% of total provincial population, so we are catching the historical details of a large share of population. The second fact is that ignoring the history of smaller towns (those outside the 400 group) is equivalent to assume that all of them were never free-city states, and this is not unreasonable.

is not violated.

Panel B of Table 9 shows the results from the first stage of IV regressions. The dependent variable (the potentially endogenous variable) is the interaction of ΔFO and the proxy for civic capital. In columns (1) - (3) civic capital is measured respectively by turnout in referenda, blood donations, and volunteering, whereas the principal component is used in columns (4) and (5). In columns (1) - (4) we use fewer controls, while in column (5) we have the full array of controls. As expected, the length of independence during the Middle Age has strong predictive power on the current stock of civic capital, even after controlling for the other regressors. The coefficient of the interaction of ΔFO with the log of the years of independence is positive and statistically significant in each specification. Partial R^2 is large. Moreover, the F-statistics of the excluded instrument are in general sufficiently large to conclude that we do not employ a weak instrument, because they are larger or close to 10.[36]

Results from the second stage are presented in Panel A of Table 9. As in the case of OLS, the interaction of ΔFO with civic capital is positive and statistically different from zero at conventional levels of significance. For each proxy of civic capital, the magnitude of IV estimates is larger than their OLS counterparts. A possible explanation is that civic capital is still measured with error, even in the case of the first principal component. As a result, OLS are downward biased, and the true magnitude of the effect is given by the IV estimates. In the literature about institutions and development there are notable cases where IV estimates are larger than the OLS ones. We mention here the papers by Acemoglu et al. (2001) and Gorodnichenko and Roland (2011). Also these papers plead for the presence of an attenuation bias due to measurement error. As a robustness check, and to address concerns that our instrument might violate the exclusion restriction, we estimate in column (5) a more general specification in which additional regressors are included. We include the share of university graduates, and the length of trials in civil law affairs. The results are robust to this inclusion. The coefficient of interest is still significant at the 10% level, and it is still larger than the corresponding OLS coefficient in column (3) of Table 7.

To sum up, IV estimation with an historical instrument provides results which are consistent with OLS findings. IV point estimates are actually larger than OLS. Then, we are confident that OLS are not plagued by reversed causality and by omitted variables bias.

8 Conclusion

We showed that the effect of foreign ownership on firm performance depends on the stock of civic capital of the area where the recipient firm of the FDI is located. Starting from an econometric model where the productivity of a firm is assumed to depend on the foreign ownership status and civic capital, we turned to a first-differencing approach in order to identify the effect on productivity. We found that civic capital has a

[36]The standard threshold of 10 for the rejection of the null of a weak instrument is valid under the hypothesis that the error term $\Delta\epsilon_{ijst}$ is white noise. We are in this case when ϵ_{ijst} follows a random walk (shocks to productivity are very persistent, something that is plausible in our context).

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 found an effect which is not statistically different from zero. Overall, these results suggest that civic capital substantially limits assimilation and governance costs of foreign firms. We also found that a change in foreign ownership status is more likely to lead to innovations in managerial-organizational practices in areas where civic capital is higher. The estimation took explicitly into account unobserved firm-level heterogeneity, as well as industry, province, and time trends.

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 norms and institutions at the local level, and in particular we show that the level of local civic capital exerts an effect on performance. Globalization is steadily increasing the weight of foreign firms in national economies worldwide. Hence, learning the determinants of the TFP of foreign enterprises is important since it can inform us on the constraints faced by them in particular environments, and, implicitly, about the determinants of aggregate productivity.

We believe that future research on the topic should address the following issues. First of all, our analysis admittedly provides 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) highlight 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 Italy interacts with civic capital to influence the performance of foreign firms.

9 Appendix

9.1 Detailed description of the data set

9.1.1 Firm-level variables

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

Capital stock: Fixed assets, deflated through an average of the 2-digit price indices employed for value added. Base year is 2000. Source: Bureau Van Dijk's 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, and the question C2.1.1 regarding managerial-organizational innovations.

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.

C2.1.1. During the years [e.g., 2001-2003 for the 9th wave] the firm realized: *[Multiple choices allowed]*
1. product innovations
2. process innovations
3. managerial-organizational innovations linked to product innovations
4. managerial-organizational innovations linked to process innovations
5. none of them

9.1.2 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.

9.1.3 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.

Average length of communal independence: Starting from the 400 city data set of Guiso et al. (2008a), we assign each city to a province. We then compute the average length of communal independence at the provincial level by weighting each city's years of independence during the Middle Age with its population in 1871 (this information about historical population is also provided in the data set).

9.1.4 Other provincial covariates

Population density: Total population over total provincial area, expressed in thousands of inhabitants per squared kilometer, averaged over the period 1995-2003. Source: Istat.

Corruption: We measure corruption through the index proposed by Golden & Picci (2005). The corruption variable is built as follows. First, the authors consider a measure of physical public infrastructure in each Italian province with reference to a specific year, 1997. Second, they retrieve the stock of public capital from a historically cumulative measure of yearly expenditures in infrastructure (from 1954) using the perpetual inventory method. The authors then take the ratio of the two measures. When a province shows a relatively low value of physical infrastructure in terms of the "real" 1997 value, but a relatively high infrastructure stock according to the expenditures flows aggregated by the perpetual inventory method, this can be taken as evidence of corruption, or, more generally, inefficiency and waste in public spending. The authors provide the data in the Appendix C of their paper.

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.

9.2 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.

9.3 Online supplementary material

Supplementary material with some other regressions is available online.

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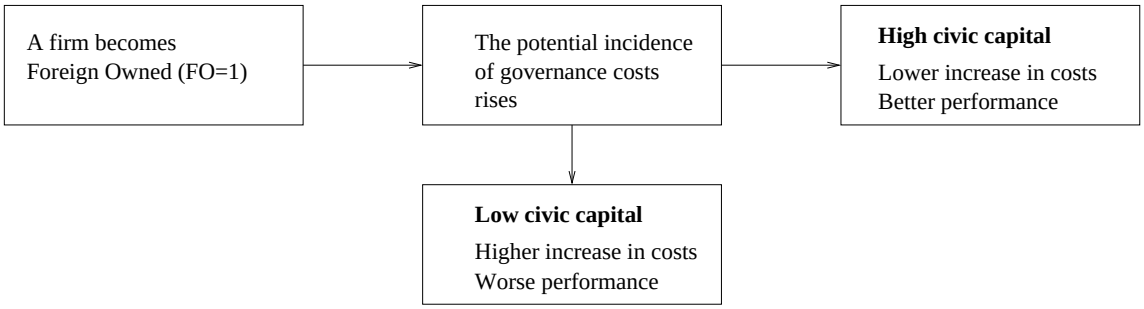
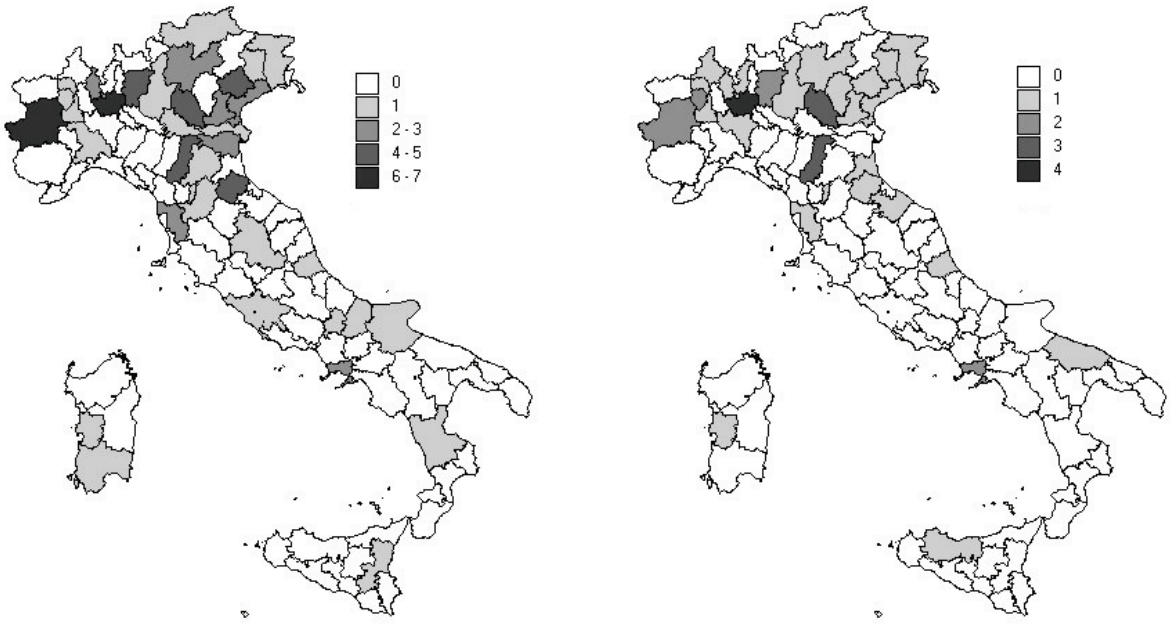


Figure 1: Change in foreign ownership and firm performance: The role of civic capital.



(a) (b)

Figure 2: Total number of start (panel a) and stop (panel b) events by province.

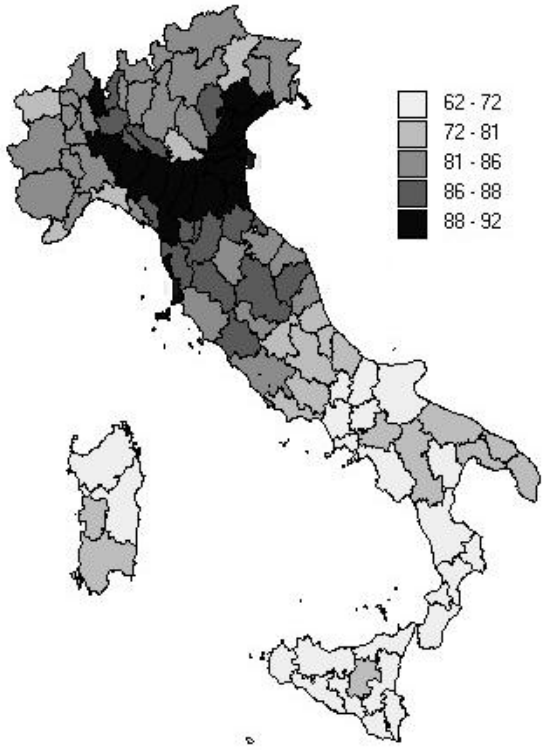


Figure 3: Map of electoral turnout in referenda, averaged over 7 referenda that took place between 1946 and 1987.

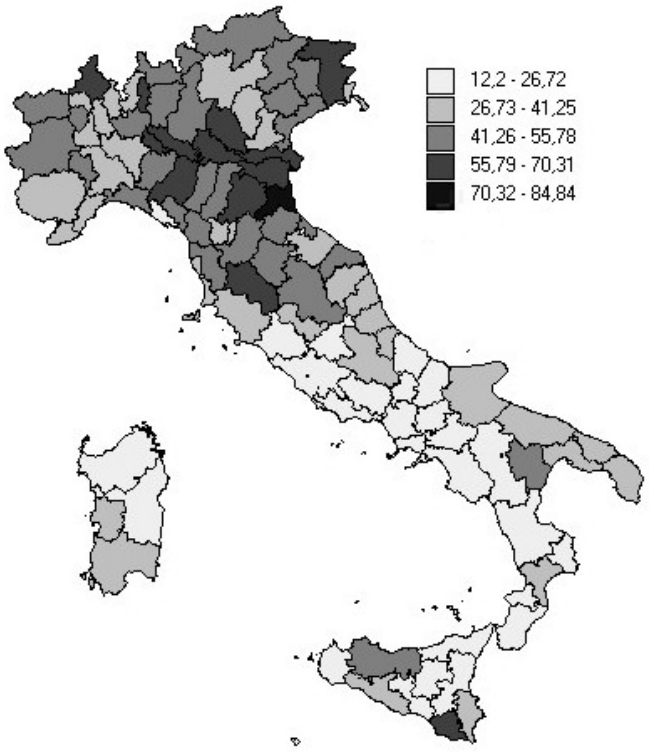


Figure 4: Map of blood donations per 1000 inhabitants.

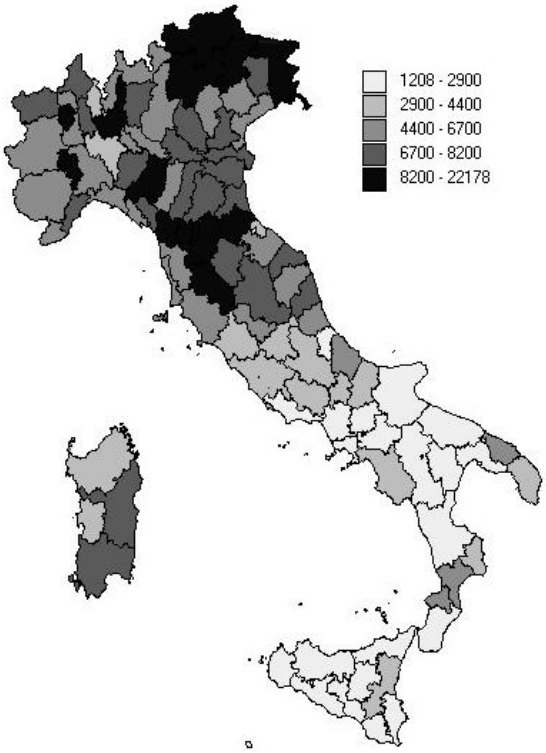


Figure 5: Map of the number of volunteers in non-profit organizations per 100,000 inhabitants.

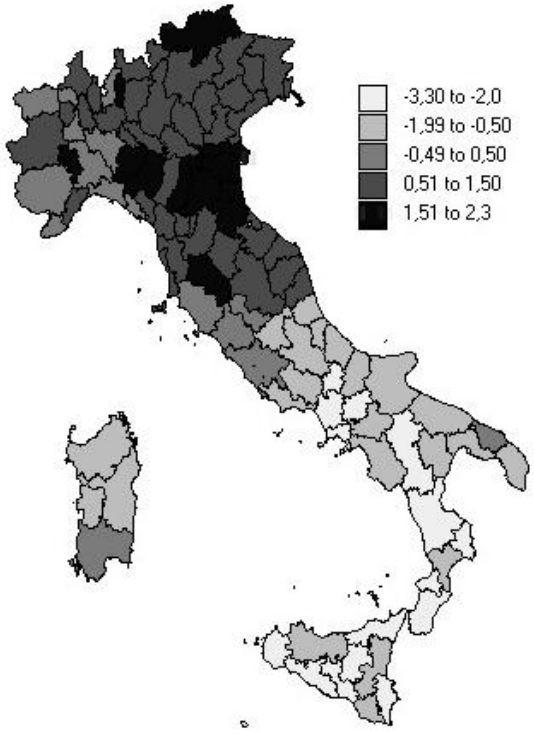


Figure 6: Map of civic capital measured by the first principal component of blood donations, volunteering, and electoral turnout.

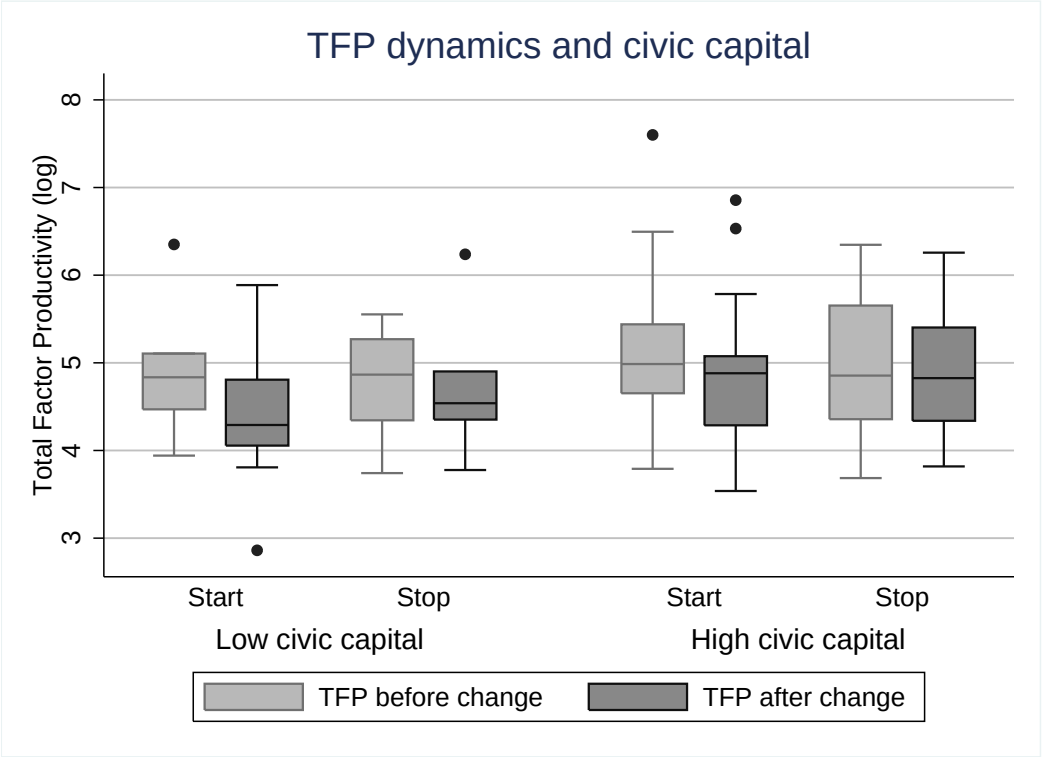


Figure 7: This graph plots the distribution of TFP before (light gray) and after (dark gray) a start or a stop event, for low civic capital provinces and high civic capital provinces respectively. The dots outside the boxes are outliers.

Table 1: Firm performance and ownership structure

	START event			STOP event			Always	Always
	Before	After	Variation	Before	After	Variation	Domestic	Foreign
Capital stock (log)	8.222	7.978	-.243***	8.002	7.939	-.063	6.981	9.135
Workers (log)	4.136	4.184	.049*	4.252	4.202	-.050	3.596	4.936
Value added per worker (log)	4.302	3.889	-.413***	4.024	3.860	-.164***	3.684	3.897
Total Factor Prod. (log)	5.068	4.694	-.374***	4.795	4.675	-.120**	4.387	4.961
Obs.	73	73	73	40	40	40	1802	16

Note: The table shows the performance of firms according to different types of ownership structure. First of all, we report the mean of 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 domestic 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 deflated value added divided by the total number of workers employed by the firm; *Capital* is equal to deflated fixed assets; *Workers* is the total number of employees; *Total Factor Productivity* is a residual term whose computation follows Levinsohn & Petrin (2003). ***,**,* denote significance at the 1%, 5%, 10% level, respectively, of a paired t-test where the null is the equality of the mean before and after the relevant event.

Table 2: Correlation among the proxies of civic capital and the other provincial covariates

	Turnout	Volunteers	Blood	Princ. comp.	Pop. density	Corruption	GDP	Univ. graduates
Volunteers	0.69	1						
Blood	0.61	0.57	1					
Princ. comp.	0.89	0.87	0.84	1				
Pop. density	0.15	-0.01	0.06	0.08	1			
Corruption	-0.60	-0.47	-0.57	-0.63	0.24	1		
GDP	0.28	0.10	0.23	0.24	0.62	-0.05	1	
Univ. graduates	0.19	0.12	0.12	0.16	0.33	0.03	0.44	1
Length of trials	-0.67	-0.54	-0.60	-0.70	-0.13	0.49	-0.27	-0.11

Note: The number of observations is 103. We take the logarithm of all variables. *Turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Blood* is the log of the number of blood donations per 1000 inhabitants inn 2002; *Princ. comp.* is the the first principal component of the above mentioned three proxies of civic capital; *Pop. density* is the log of provincial population density averaged over the period 1995-2003; *Corruption* is the log of the Golden-Picci index of corruption at the provincial level; *GDP* is the log of provincial gross domestic product averaged over the period 1995-2003; *Univ. graduates* is the log of the share of provincial population holding a university degree in 2001; *Length of trials* is the provincial log of the number of days needed to complete a first-degree trial averaged over the period 1995-2003.

Table 3: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	1st Quartile	Median	3rd Quartile
Firm-level variables								
Total Factor Productivity (log)	1954	4.417	0.650	2.619	8.802	4.001	4.375	4.769
Managerial innovation$_{t+1}$ (process)	619	0.233	0.423	0	1	0	0	0
Value added per worker (log)	1954	3.699	0.435	2.021	6.065	3.436	3.695	3.959
Change in foreign owned share	1954	1.420	18.840	-100	100	0	0	0
Workers (log)	1954	3.656	1.004	2.398	8.558	2.944	3.401	4.078
Capital (log)	1954	7.074	1.568	2.421	14.550	6.045	6.980	7.965
Skilled (log)	1954	2.375	1.071	0	7.378	1.609	2.197	2.833
Civic capital and other provincial 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	1.500	-3.347	2.307	-1.231	0.451	1.13
Population density (log)	103	5.113	0.785	3.296	7.870	4.626	5.144	5.539
Corruption (log)	103	0.033	0.556	-0.883	1.863	-0.419	-0.059	0.438
GDP (log)	103	8.800	0.793	7.038	11.556	8.252	8.709	9.237
University graduates (log)	103	1.854	0.175	1.455	2.453	1.733	1.846	1.935
Length of trials (log)	103	7.126	0.317	6.480	7.992	6.907	7.088	7.355

Note: The table provides descriptive statistics for some variables. The firm-level variables are: *Total Factor Productivity* is the log of TFP, computed according to Levinsohn & Petrin (2003); *Managerial innovation*$_{t+1}$ *(process)* is the one period lead of whether the firm performs a managerial-organizational innovation related to the production process; *Value added per worker* is the log of deflated value added divided by the total number of workers employed by the firm; *Change in foreign share* is the change in the total amount of shares held by foreigners; *Workers* is the total number of employees; *Capital* is equal to deflated fixed assets; *Skilled* is the total number of entrepreneurs, executives and white collars (a subset of 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 density* is the log of provincial population density, averaged over the years from 1995 to 2003; *Corruption* is the log of the Golden-Picci index of corruption at the provincial level; *GDP* is the log of provincial value added, averaged over the years from 1995 to 2003; *University graduates* is the log of the share of provincial population holding a university degree in 2001; *Length of trials* is the provincial log of the number of days needed to complete a first degree trial, averaged over the period 1995-2003.

Table 4: TFP dynamics and ownership change with civic capital interactions: ΔFO variable.

	(1) No interaction Coef./se	(2) Turnout Coef./se	(3) Blood Coef./se	(4) Volunteers Coef./se	(5) Principal comp. Coef./se	(6) No density Coef./se	(7) No civic capital Coef./se
ΔFO	-0.029	-4.829***	-1.486***	-1.598**	-0.597***	-0.070	-0.404**
	(0.032)	(1.611)	(0.493)	(0.672)	(0.188)	(0.050)	(0.161)
$\Delta FO * \ln Turnout$		0.981***					
		(0.354)					
$\Delta FO * \ln Blood$			0.256**				
			(0.106)				
$\Delta FO * \ln Volunteers$				0.124*			
				(0.065)			
$\Delta FO *$ *Principal comp.*					0.073**	0.054	
					(0.029)	(0.038)	
$\Delta FO * \ln$ *Population density*		0.080***	0.087***	0.084***	0.090***		0.066**
		(0.027)	(0.027)	(0.029)	(0.031)		(0.027)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.352	0.355	0.355	0.354	0.355	0.353	0.353
Obs.	1954	1954	1954	1954	1954	1954	1954

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 domestic owned; $\Delta FO = 0$ if a firm does not change ownership status (it stays domestic 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; *Principal comp.* is the first principal component of the above mentioned three proxies of civic capital. We also include as a control ln *Population density*, which is the log of provincial population density averaged over the period 1995-2003. Standard errors are clustered at the provincial level. ***,**,* 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)	(2)	(3)	(4)	(5)
	No interactions	Turnout	Blood	Volunteers	Principal comp.
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
START	-0.008	-5.366***	-1.513**	-1.180*	-0.515**
	(0.037)	(1.814)	(0.625)	(0.641)	(0.203)
$START * \ln Turnout$		1.123***			
		(0.399)			
$START * \ln Blood$			0.281*		
			(0.150)		
$START * \ln Volunteers$				0.086	
				(0.069)	
$START * \ln$ *Principal comp.*					0.072**
					(0.031)
STOP	0.063	3.990	1.442	2.190	0.738**
	(0.058)	(3.363)	(0.914)	(1.441)	(0.349)
$STOP * \ln Turnout$		-0.759			
		(0.729)			
$STOP * \ln Blood$			-0.212		
			(0.196)		
$STOP * \ln Volunteers$				-0.176	
				(0.146)	
$STOP * \ln$ *Principal comp.*					-0.073
					(0.064)
$START * \ln$ *Population density*		0.067**	0.078***	0.072**	0.079**
		(0.030)	(0.030)	(0.032)	(0.032)
$STOP * \ln$ *Population density*		-0.099**	-0.102**	-0.103*	-0.109**
		(0.048)	(0.048)	(0.054)	(0.055)
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.	1954	1954	1954	1954	1954

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 domestic 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 density*, which is the log of provincial population density averaged over the period 1995-2003. Standard errors are clustered at the provincial level. ***,**,* denote significance at the 1%, 5%, 10% level, respectively.

Table 6: TFP dynamics, ownership change and civic capital for different variables of foreign ownership.

	(1)	(2)	(3)	(4)
	FO 30%	*FO* 50%	Foreign share	Share increase-decrease
	Coef./se	Coef./se	Coef./se	Coef./se
$\Delta FO30$	-0.586**			
	(0.251)			
$\Delta FO30 * Principal\ comp.$	0.060*			
	(0.031)			
$\Delta FO50$		-0.538***		
		(0.208)		
$\Delta FO50 * Principal\ comp.$		0.092**		
		(0.039)		
$\Delta Foreign\ share$			-0.008***	
			(0.002)	
$\Delta Foreign\ share * Principal\ comp.$			0.001**	
			(0.000)	
Increase foreign share				-0.006***
				(0.002)
Increase foreign share $*$ *Principal comp.*				0.001**
				(0.000)
Decrease foreign share				0.014*
				(0.008)
Decrease foreign share $*$ *Principal comp.*				-0.001
				(0.001)
Other controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R^2	0.355	0.356	0.356	0.356
Obs.	1954	1954	1954	1954

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, $\Delta\omega_{ijst}$. When 30 or 50 are added the threshold for foreign ownership is set at 30% and 50%, respectively. Δ*Foreign share* is the total variation in the shares held by foreign persons. The variables *Increase foreign share* and *Decrease foreign share* are the absolute values of the variation in foreign shares. Standard errors are clustered at the provincial level. ***, **, * denote significance at the 1%, 5%, 10% level, respectively.

Table 7: Other robustness and sensitivity checks

	(1) Corruption Coef./se	(2) GDP Coef./se	(3) Provincial cov. Coef./se	(4) Firm cov. Coef./se	(5) No Milan Coef./se	(6) Many START/STOP Coef./se	(7) No Always FO Coef./se
ΔFO	-0.621**	-0.978***	0.063	-0.690***	-0.852***	-0.181	-0.598***
	(0.273)	(0.295)	(1.367)	(0.216)	(0.232)	(0.158)	(0.187)
$\Delta FO * Princ.\ comp.$	0.070*	0.052*	0.048*	0.087***	0.090***	0.021**	0.072**
	(0.039)	(0.030)	(0.029)	(0.032)	(0.029)	(0.009)	(0.029)
$\Delta FO * \ln Corruption$	-0.013						
	(0.105)						
$\Delta FO * \ln GDP$		0.094***					
		(0.031)					
$\Delta FO * \ln Population\ density$	0.094**		0.055	0.106***	0.136***	0.031	0.090***
	(0.048)		(0.036)	(0.036)	(0.038)	(0.021)	(0.031)
$\Delta FO * \ln University\ graduates$			0.226				
			(0.215)				
$\Delta FO * \ln Length\ of\ trials$			-0.126				
			(0.166)				
$\Delta \ln Size_{t-1}$				-0.008			
				(0.088)			
$\Delta \ln Capital_{t-1}$				0.135***			
				(0.039)			
$\Delta \ln Skilled_{t-1}$				0.028			
				(0.113)			
$\Delta \ln Size_{t-1} * Princ.\ comp.$				0.072			
				(0.049)			
$\Delta \ln Capital_{t-1} * Princ.\ comp.$				-0.045			
				(0.028)			
$\Delta \ln Skilled_{t-1} * Princ.\ comp.$				0.055			
				(0.087)			
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.355	0.356	0.356	0.351	0.362	0.386	0.359
Obs.	1954	1954	1954	1638	1772	451	1938

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 domestic owned; $\Delta FO = 0$ if a firm does not change ownership status (it stays domestic or foreign owned). Civic capital is measured by *Princ. comp.*, which is the first principal component of the three direct proxies of civic capital. The included provincial controls are: $\ln$ *Corruption* is the log of the Golden-Picci index of corruption at the provincial level; $\ln GDP$ is the log of provincial gross domestic product averaged over the period 1995-2003; $\ln$ *Population density* is the log of provincial population density averaged over the period 1995-2003; $\ln$ *University graduates* is the log of the share of provincial population holding a university degree in 2001; $\ln$ *Length of trials* is the provincial log of the number of days needed to complete a first-degree trial averaged over the period 1995-2003. The included firm-level controls are: $\Delta \ln Size_{t-1}$ is the growth in the total number of employees lagged by one period; $\Delta \ln Capital_{t-1}$ is the growth in the capital stock of the firm lagged by one period; $\Delta \ln Skilled_{t-1}$ is the growth in the number of skilled workers lagged by one period. Standard errors are clustered at the provincial level. ***, **, * denote significance at the 1%, 5%, 10% level, respectively.

Table 8: Other firm-level outcomes as dependent variable

	(1)	(2)	(3)	(4)	(5)
	Manag. innovation$_{t+1}$ (process, cond.)	*Manag. innovation*$_{t+1}$ (process, uncond.)	*Manag. innovation*$_{t+1}$ (product, cond.)	*Manag. innovation*$_{t+1}$ (product, uncond.)	VA per worker
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
ΔFO	-5.449	0.817	-9.275	-8.079	0.702
	(15.845)	(15.327)	(14.091)	(12.759)	(1.110)
$\Delta FO * Princ.\ comp.$	0.799**	0.504**	0.072	0.186	0.037*
	(0.323)	(0.254)	(0.331)	(0.313)	(0.020)
$\Delta FO * \ln Population\ density$	-0.325	-0.193	-0.333	-0.475	0.072**
	(0.267)	(0.273)	(0.330)	(0.343)	(0.029)
$\Delta FO * \ln University\ graduates$	0.772	0.205	-0.644	-0.541	0.165
	(1.529)	(1.753)	(2.094)	(1.896)	(0.197)
$\Delta FO * \ln Length\ of\ trials$	0.736	-0.043	1.826	1.764	-0.207
	(2.005)	(1.948)	(1.848)	(1.658)	(0.132)
Process innovation$_{t+1}$	1.643***				
	(0.251)				
Product innovation$_{t+1}$			1.496***		
			(0.212)		
$\Delta \ln Size$	0.623	0.434	1.938*	1.628*	-0.546***
	(0.589)	(0.599)	(1.015)	(0.988)	(0.038)
$\Delta \ln Capital$	-0.211	-0.127	0.100	0.205	0.099***
	(0.198)	(0.190)	(0.299)	(0.300)	(0.018)
$\Delta \ln Skilled$	0.174	0.174	-0.059	0.038	-0.069**
	(0.408)	(0.365)	(0.494)	(0.460)	(0.033)
$\Delta \ln Size * Princ.\ comp.$	-0.671	-0.751	-1.897**	-1.561**	0.037
	(0.502)	(0.490)	(0.887)	(0.773)	(0.028)
$\Delta \ln Capital * Princ.\ comp.$	0.157	0.118	-0.132	-0.100	-0.011
	(0.170)	(0.167)	(0.298)	(0.294)	(0.014)
$\Delta \ln Skilled * Princ.\ comp.$	-0.183	-0.003	0.014	-0.100	-0.008
	(0.323)	(0.257)	(0.452)	(0.375)	(0.026)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2/R^2	0.346	0.165	0.293	0.149	0.576
Obs.	619	619	641	641	1960

Note: Columns from (1) to (4) present the results of probit estimates. Column (5) presents the results of OLS estimates. Fixed effects for each 2-digit industry, each province, and each time period are included. The dependent variable in columns (1) and (2) is a dummy equal to one if the firm adopted a managerial-organizational innovation related to a process innovation at time $t+1$. The dependent variable in columns (3) and (4) is a dummy equal to one if the firm adopted a managerial-organizational innovation related to a product innovation at time $t+1$. The dependent variable in column (5) is value added per worker. Unless otherwise stated, all firm-level regressors are measured at time t (they are contemporaneous to the change in foreign ownership). 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 domestic owned; $\Delta FO = 0$ if a firm does not change ownership status (it stays domestic or foreign owned). Civic capital is measured by *Princ. comp.*, which is the first principal component of the three direct proxies of civic capital. The included provincial controls are: $\ln$ *Population density* is the log of provincial population density averaged over the period 1995-2003; $\ln$ *University graduates* is the log of the share of provincial population holding a university degree in 2001; $\ln$ *Length of trials* is the provincial log of the number of days needed to complete a first-degree trial averaged over the period 1995-2003. The included firm-level controls are: *Process innovation*$_{t+1}$ is a dummy equal to one if the firm realized a process innovation at time $t+1$; *Product innovation*$_{t+1}$ is a dummy equal to one if the firm realized a product innovation at time $t+1$; $\Delta \ln Size$ is the growth in the total number of employees; $\Delta \ln Capital$ is the growth in the capital stock of the firm; $\Delta \ln Skilled$ is the growth in the number of skilled workers. Standard errors are clustered at the provincial level. ***, **, * denote significance at the 1%, 5%, 10% level, respectively.

Table 9: IV regressions

	(1)	(2)	(3)	(4)	(5)
Panel A: Second stage					
	Turnout	Blood	Volunteers	Principal comp.	Principal comp.
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
ΔFO	-8.077**	-2.624**	-3.651**	-0.713***	-2.151
	(3.840)	(1.058)	(1.745)	(0.267)	(1.984)
$\Delta FO * \ln$ *Turnout*	1.701**				
	(0.862)				
$\Delta FO * \ln$ *Blood*		0.524**			
		(0.249)			
$\Delta FO * \ln$ *Volunteers*			0.338*		
			(0.178)		
$\Delta FO *$ *Principal comp.*				0.117**	0.130*
				(0.056)	(0.073)
$\Delta FO * \ln$ *Population density*	0.090**	0.110***	0.115*	0.104**	0.098*
	(0.040)	(0.042)	(0.060)	(0.044)	(0.057)
$\Delta FO * \ln$ *University graduates*					0.152
					(0.240)
$\Delta FO * \ln$ *Length of trials*					0.170
					(0.250)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.354	0.353	0.351	0.355	0.355
Obs.	1954	1954	1954	1954	1954
Panel B: First stage					
$\Delta FO * \ln$ *Years of indep.*	0.023***	0.075***	0.117***	0.337***	0.222***
	(0.009)	(0.023)	(0.043)	(0.103)	(0.053)
ΔFO	4.496***	4.187***	9.544***	2.426*	21.132***
	(0.095)	(0.292)	(0.689)	(1.394)	(4.611)
$\Delta FO * \ln$ *Population density*	-0.025	-0.119*	-0.202	-0.484	-0.567***
	(0.022)	(0.060)	(0.128)	(0.294)	(0.176)
$\Delta FO * \ln$ *University graduates*					0.589
					(0.502)
$\Delta FO * \ln$ *Length of trials*					-2.735***
					(0.621)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.371	0.325	0.247	0.411	0.293
F-stat. of excluded instrument	7.35	10.75	7.43	10.61	17.49
Obs.	1954	1954	1954	1954	1954

Note: The table presents the results of IV estimates. Fixed effects for each 2-digit industry, each province, and each time period are included. Panel A presents the second stage with the change in log TFP, $\Delta\omega_{ijst}$, as the dependent variable. Panel B presents the first stage where the dependent variable is, respectively: the interaction of the log of *Turnout*, average electoral turnout in referenda between 1946 and 1987, and ΔFO (column 1); the interaction of the log of *Blood*, number of blood donations per 1000 inhabitants in 2002, and ΔFO (column 2); the interaction of the log of *Volunteers*, number of volunteers in non-profit institutions per 100,000 inhabitants in 2000, and ΔFO (column 3); the interaction of *Principal comp.*, the first principal component of the three above mentioned proxies of civic capital, and ΔFO (columns 4 and 5). *Years of indep.* is the weighted provincial average of the number of years the cities were independent during the Middle Age, with weights given by cities' population in 1871. *Population density* is provincial population density, averaged over the period 1995-2003. *University graduates* is the share of provincial population holding a university degree in 2001; *Length of trials* is the number of days at the provincial level needed to complete a first degree trial, averaged over the period 1995-2003. Standard errors are clustered at the provincial level. ***,**,* denote significance at the 1%, 5%, 10% level, respectively.

Foreign ownership, firm performance, and the geography of civic capital: Online supplementary material

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This appendix contains online supplementary material for our paper titled "Foreign ownership, firm performance, and the geography of civic capital".

A Results from some other regressions

A.1 Various checks

Column (1) in Table A shows what happens when we saturate our equation with many provincial covariates interacted with civic capital. In addition to population density, university graduates and the length of civil trials we add to the model the total labor market participation rate. In this case the statistical significance of the interaction term of foreign ownership and civic capital disappears. We find this regression of limited interest. While the point estimate of the interaction between civic capital and ΔFO is 0.077, and hence very close to the estimate of 0.073 in column (5) of Table 4 in the baseline model, the statistical significance is much lower due to a large standard error. This is pointing to a significant multicollinearity among regressors, and it is what we expected to happen after adding more and more controls. In the paper, we prefer to present the results from more parsimonious specifications. Due to the structure of the econometric model, the multicollinearity problem is particularly severe in our case, because all provincial regressors are interacted with the same ΔFO variable. This introduces a strong correlation among covariates.

In column (2) of Table A we estimate a specification where we have regional (NUTS 2) fixed effects instead of provincial (NUTS 3) fixed effects. This allows introducing the variable in level of provincial civic capital in the righthand side, along with other regressors in levels. The variable in level of civic capital captures whether the change in productivity over the three-year period for firms that do not experience a change in foreign ownership status ($\Delta FO = 0$) is related in some manner to civic capital. It turns out that TFP dynamics for these firms is not related in a statistically significant manner to local civic capital. We replicate the same exercise with a wider array of provincial covariates in column (3) and get the same results. Estimates in columns (2) and (3) of Table A are very close to those in column (5) of Table 4 and column (3) of Table 7. Stability of coefficients under different specifications is nice.

In the paper we assume that, conditional on our set of regressors, the correlation between the change in foreign ownership status, ΔFO_{it}, and the error term $\Delta\epsilon_{ijst}$ is zero. This assumption is satisfied if $E(\epsilon_{ijst} \mid \mathbf{FO}_i, \eta_i) = 0$, where $\mathbf{FO}_i$ is the vector of FO_{it} for all t's, a condition known as strict exogeneity. Strict exogeneity is violated when foreign acquisitions ($FO_{it} = 1$) follow positive shocks to the error term ($\epsilon_{ijst-1} > 0$). Wooldridge (2002) proposes a simple regression-based test to verify whether FO_{it} and ϵ_{ijst-1} are really uncorrelated. We describe the procedure in footnote 21 in the paper. In column (4) of Table A we report the estimates of this regression-based test. It turns out that the coefficient on FO_{it} is not statistically different from zero, and so we are confident that foreign acquisitions are uncorrelated with past realizations of the error term.

A.2 Regressions at the level of Local Labor Systems

In Table B we experiment with a different geography level and different data for the computation of civicness. We use a specification where civic capital is computed at the level of the 686 Italian Local Labor Systems (LLSs). To do so, we compute two new proxies for civicness, because data on the original proxies employed in the paper are unavailable at this more detailed level of geography. The first new proxy is the number of non-profit organizations (i.e., the number of plants in the 4-digit industry 9133 "Activities of other membership organizations n.e.c." from Istat Census 2001) for each LLS, normalized by the population of the LLS. The second is LLS's turnout in the 1996 political elections. Results in columns (1) and (2) of Table B show that, although the point estimates are positive as expected, they are not statistically significant. The same result is

obtained in column (3) when we compute the principal component of these two variables. In these regressions we always have LLS fixed effects.

In columns (4), (5) and (6) of Table B we replicate the regressions with the same variables (non-profit organizations, turnout in 1996 political elections, and their first principal component), computed this time at the provincial level. Correspondingly, these regressions incorporate provincial population density and province fixed effects. Results show that the number of non-profit organizations is still not significant statistically (probably because it is an imperfect measure of civicness). On the contrary, turnout in 1996 political elections is significant at the 5% level. This is reassuring, and it is consistent with the fact that the referenda turnout we are employing in the paper (see column (2) in Table 4) and turnout in political elections are known to be positively correlated. So, it is natural to get similar results also in terms of statistical significance from these two related variables. We are left with explaining why turnout in political elections is working less satisfactorily when it is disaggregated at the LLS level. We think this is due to the idiosyncratic nature of turnout in political elections when it is measured on a small spatial scale such as LLSs. The presence of candidates to the national Parliament with strong ties to the LLS (for example, a candidate living in the territory of the LLS, or particularly popular there) may had spurred an abnormally high level of turnout in some areas. An intense participation to elections based on strong personal ties to the candidate does not fit our definition of civic capital and our conceptual framework, since it relies more on the so-called bonding social capital than on civic engagement and concern for the common good. Abnormally high levels of participation in some LLSs are attenuated by aggregation at the provincial level. All this may account for the discrepancy in terms of statistical significance between LLS and provincial regressions.

Table A: Various checks

	(1) Many provincial controls Coef./se	(2) Regional FE Coef./se	(3) Regional FE Coef./se	(4) Strict exogeneity test Coef./se
ΔFO	2.202	-0.596***	0.315	0.019
	(4.778)	(0.152)	(1.098)	(0.053)
FO				-0.078
				(0.055)
$\Delta FO * Principal\ comp.$	0.077	0.076***	0.050*	
	(0.066)	(0.025)	(0.026)	
$\Delta FO * \ln Population\ density$	0.056	0.089***	0.058	
	(0.036)	(0.027)	(0.035)	
$\Delta FO * \ln University\ graduates$	0.229		0.190	
	(0.215)		(0.229)	
$\Delta FO * \ln Length\ of\ trials$	-0.136		-0.154	
	(0.160)		(0.138)	
$\Delta FO * \ln Participation\ rate$	-0.501			
	(1.137)			
$Principal\ comp.$		0.012	0.007	
		(0.019)	(0.018)	
$\ln Population\ density$		-0.026***	-0.032***	
		(0.009)	(0.012)	
$\ln University\ graduates$			0.035	
			(0.030)	
$\ln Length\ of\ trials$			-0.007	
			(0.058)	
Industry FE	Yes	Yes	Yes	Yes
Province FE	Yes	No	No	Yes
Region FE	No	Yes	Yes	No
Year FE	Yes	Yes	Yes	Yes
R^2	0.356	0.334	0.335	0.353
Obs.	1954	1954	1954	1954

***, **, * denote significance at the 1%, 5%, 10% level, respectively.

Table B: Regressions at the level of Local Labor Systems

	(1) Non-prof. org., LLS Coef./se	(2) Turnout 1996, LLS Coef./se	(3) Princ. comp., LLS Coef./se	(4) Non-prof. org., prov Coef./se	(5) Turnout 1996, prov Coef./se	(6) Princ. comp., prov Coef./se
ΔFO	-0.555	-0.195	-0.306	-1.717**	-0.191	-0.705***
	(0.670)	(0.182)	(0.200)	(0.839)	(0.147)	(0.196)
$\Delta FO * \ln$ *Non-prof. organizations*	0.053			0.214		
	(0.108)			(0.134)		
$\Delta FO * \ln$ *Turnout political elections 1996*		0.301			1.299**	
		(0.416)			(0.519)	
$\Delta FO *$ *Principal component*			0.041			0.102**
			(0.045)			(0.043)
$\Delta FO * \ln$ *Population density*	0.044	0.035	0.043	0.113***	0.065***	0.110***
	(0.035)	(0.030)	(0.031)	(0.038)	(0.022)	(0.030)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	No	No	Yes	Yes	Yes
LLS FE	Yes	Yes	Yes	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.437	0.437	0.438	0.354	0.355	0.355
Obs.	1951	1954	1951	1954	1954	1954

***, **, * denote significance at the 1%, 5%, 10% level, respectively.