Politicians at Work*

The Private Returns and Social Costs of Political Connections

Federico Cingano
Bank of Italy

Paolo Pinotti
Bank of Italy

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Abstract

We quantify the private returns and social costs of political connections exploiting a unique longitudinal dataset that combines matched employer-employee data for a representative sample of Italian firms with administrative archives on the universe of individuals appointed in local governments over the period 1985-97. According to our results, the revenue premium granted by political connections amounts to 5.7% on average, it is obtained through changes in domestic sales but not in exports, and it is not related to improvements in firm productivity. The connection premium is positive for upstream producers for the public administration only, and larger (up to 22%) in areas characterized by high public expenditure and high levels of corruption. These findings suggest that the gains in market power derive from public demand shifts towards politically connected firms. We estimate such shifts reduce the provision of public goods by approximately 20%.

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*Contacts: federico.cingano@bancaditalia.it and paolo.pinotti@bancaditalia.it, Structural Economic Analysis Department, Bank of Italy, Via Nazionale 91, 00184, Roma. We are grateful to the Editor, Stefano Della Vigna, and three anonymous Referees for very constructive feedback on an earlier version of this paper, and to Antonio Ciccone for constant help and advice. We also benefited from the comments of Tito Boeri, Juan Carlos Conesa, Pedro dal Bò, Francesco Decarolis, Christian Dustmann, Patricia Funk, Fabiano Schivardi, Giancarlo Spagnolo, Jaume Ventura, Melvyn Weeks and seminar participants at Università Parthenope, EIEF, University of Milan, Collegio Carlo Alberto, EEA Meetings in Barcelona, University of Bologna, University College of London, Brucchi Luchino Workshop, Università Bocconi and NBER Summer Meetings for very useful comments. All errors are our responsibility. The opinions expressed herein are our own and do not necessarily represent those of the Bank of Italy.

1 Introduction

Connections between firms and politicians are widespread in most countries. They are also highly valued by investors, who attach a significant premium to the stock market value of connected firms (Faccio, 2006b). The mechanisms inducing the (expected) profits of connected firms to raise are largely unexplored, however, and can in principle bear very different implications for social welfare. On the one hand, rent-seeking practices enacted by firms and politicians could impose large social costs on the rest of the economy. On the other hand, if the competitive advantage of connected firms stems from higher productivity, political connections might not necessarily imply negative effects on welfare. Addressing these issues requires moving beyond financial market evaluations of political connections.

In this paper we examine the real effects of political connections in product and factor markets. Our identification strategy is based on a simple theoretical framework allowing us to quantify the private returns to political connections in terms of revenues, profits and wages, and the associated social costs in terms of misallocation of public expenditure. To estimate the model, we assembled a unique longitudinal dataset matching detailed information on a representative sample of Italian manufacturing firms and all their employees with administrative archives on the universe of Italian local politicians over the period 1985-97.

Detailed employer-employee data provide several advantages for the purpose of this work. First, they allow to identify connections on the basis of precise links between politicians and firms; in particular, we will define as connected those firms employing (at least) one individual appointed in a local government. Differently from the national members of parliament, most Italian local politicians retain in fact other occupations alongside their political career; at the same time, they manage a relevant share of the public budget and are much less monitored than their national-level colleagues. Second, the longitudinal dimension of our data set allows us to control for unobserved heterogeneity, time-varying shocks and for the selection of local politicians into firms, thus leading to a much cleaner estimate of the effects of political connections. Third, detailed firm-level data on productive inputs, output and prices permit to identify connection-induced demand and supply shifts: distinguishing between the two is crucial in our framework for assessing the welfare consequences of political connections.

According to our results, access to political connections increases firm revenues by almost 6%, yielding to an equivalent change in current profits. These gains *only* accrue to firms establishing a connection through politicians appointed with the party (or coalition of parties) that enter the local government: firms connected through politicians appointed with opposition parties see no increase in market shares, just as non-connected firms. These findings are robust to controlling for local and industry yearly shocks and for firm-specific trends. They are also unaffected when we restrict to changes in connections that are not due to worker flows between firms, thus excluding the confounding effect of self-selection of politicians into expanding or contracting firms. The selection into connection

status by firms with higher-than-average returns does not seem to be a relevant source of concern either.

To help visualize the relevance of connection-effects, Figure 1 plots average (log) revenues for two groups of firms experiencing a change in connection status in year 1990 local elections.[1] The first group includes firms establishing (at least) one connection with the party (or coalition of parties) that won the elections; the second includes firms losing all such connections after the election. Firm-specific averages (and common shocks) have been preliminarily differenced out of the revenues series so that values greater (lower) than zero indicate firms performing above (below) average. Taken together the two lines provide suggestive evidence that changing connection status is associated to significant and lasting shifts in relative firms' performance, which improves for connecting firms and worsens for firms losing connections.

The competitive advantage enjoyed by politically connected firms can in principle be traced to alternative mechanisms, with relevant differences in terms of welfare implications. On the one hand, higher revenues could reflect greater productivity, for example because employees accessing political power help reduce the burden of administrative regulations (e.g. red tape). According to the *greasing wheel hypothesis* (Kaufmann and Wei, 1999), these practices would increase aggregate welfare by relieving economic activity from burdensome regulation (Leff, 1964; Huntington, 1968; Lui, 1985; Shleifer and Vishny, 1994). On the other hand, local politicians could simply be driving public demand toward the firms they are employed in. For instance, they could favor connected firms in public procurement, as shown by Goldman et al. (2008). The misuse of public office for private gains is a distinctive feature of outright predatory corruption (Treisman, 2000) and entails large social costs in terms of inefficient provision of goods and services (Krueger, 1974; Mauro, 1998). This is perceived to be a serious problem in many countries, especially during periods of economic crisis, as resources are scarcer and competition for them becomes stiffer (Johnson and Mitton, 2003). This alternative explanation is labeled *grabbing hand hypothesis*, after Shleifer and Vishny (1998).

Our evidence is largely consistent with this second hypothesis. Estimates from alternative production function specifications indicate that firms' productivity dynamics can *not* account for the increase in market power associated with political connections. Moreover, the average effect is entirely driven by domestic sales (as opposed to exports) and by firms operating in sectors that are intensive providers of inputs to the public administration, and it is larger in regions characterized by high public expenditure (21.9%) and high corruption (8.5%).

These findings suggest that the revenue gains experienced by politically connected firms mostly reflect favorable public demand shifts (as opposed to productivity increases), which introduce a wedge between the relative productivities and market shares of alternative

[1] In Italy, local governments stay in charge for five years and elections are regularly held at the same time for most local governments. Our observational window includes three such moments, in year 1985, 1990 and 1995. There are, however, a number of exceptions to this rule, leading to several local elections being held every year (see also Figure 2).

upstream producers for the public administration. Recent work by Bartelsman et al. (2008), Restuccia and Rogerson (2008) and Hsieh and Klenow (2009) shows that resource misallocation across heterogeneous firms may entail large efficiency losses at the aggregate level. Following a similar approach, we estimate that the connection-induced misallocation of public procurement across firms lowers the provision of goods and services from local administrations by about 20%, compared to a scenario with no (or ineffective) political connections.

Interestingly, such demand shifts have a non-monotonic relationship with the importance of the connection, as measured by the rank of politicians and employees or the size of the connected administrations. Increasing the connection level tends to generate higher returns to favored firms; for the highest level connections, the revenue premium nonetheless falls, often to non statistically significant magnitudes. Because high-rank individuals are more likely to be exposed (to the media, the public opinion, etc.), these findings speak to recent contributions on the relationship between exposure and accountability of politicians (see e.g. Ferraz and Finan, 2011).

This work is related to a recently expanding literature on the consequences of political connections. Most of these papers detect (abnormal) financial returns of connected firms around particular events like national elections (Faccio, 2006b; Jayachandran, 2006; Knight, 2007; Claessens et al., 2008; Ferguson and Voth, 2008), crises (Johnson and Mitton, 2003) and news about politicians' health (Fisman, 2001; Faccio and Parsley, 2006). Political connectedness is defined on the basis of campaign contributions or personal relationships, the latter being mostly collected from newspapers. We focus on a different measure of political connections, namely employment relationships, and depart from the event study approach. In this last respect, our work is closest to Khwaja and Mian (2005), who take advantage of a data set similar to ours. However, they focus exclusively on preferential access to credit, which is just one of the advantages possibly granted to connected companies. By contrast, we investigate a variety of outcomes and distinguish between alternative channels through which political connections may impact on firm performance.[2]

The rest of the paper is structured as follows. The next section outlines a simple theoretical framework that derives the equilibrium distribution of market shares across firms and the implied efficiency of the public sector as a function of connection-induced, firm-specific supply and demand shifts. We then discuss how to identify such shifts and their implications for the private returns and the social costs of political connections. Section 3 describes the main sources and features of our data. In Section 4 we discuss our empirical results, while Section 5 concludes.

[2] Faccio (2006a) and Li et al. (2008) also focus on different outcomes and channels, respectively. However, their identification strategy is based only on cross-sectional variation in a single year.

2 Theoretical framework

In this section we describe a simple model economy in which private producers and the public administration are allowed to interact in ways that are consistent with the institutional setting in Italy, which is concisely summarized next.[3]

2.1 Institutional background and model environment

Local public administrations in Italy influence productive activities in two main ways. First, they directly administer many of the licenses required for running an economic activity, as the construction permits necessary to start up or expand a firm. In spite of a common national legislative framework, the actual implementation of regulatory procedures rests in fact upon the single local administrations, which may imply a huge variance in the burden and costs imposed on firms across different areas of the country. Construction permits, for example, are subject to approval by the regional departments of public works and ultimately issued by municipalities. They cost to firms between 185% and 563% of per capita GDP across different local administrations; in terms of time, the process may take from 1 to 3 years (Bianco and Bripi, 2010).

In addition to licenses, local governments control about one third of total public spending. Most importantly, procurement of goods and services at the local-level accounts for nearly the entirety of purchases by the public administration.[4] Until very recently, such resources used to be transferred on the basis of a purely "historical expenditure" criterion (the amount in each given year being a predetermined mark-up over that spent the year before) and, before the introduction of a central procurement agency in the late 1990s, local administrative departments enjoyed a considerable discretionary power over the allocation of spending (Spence, 1993).

We introduce these salient features in the context of a simple economy inhabited by households, firms and a local government. The latter purchases private goods from a set of monopolistically competitive firms and we allow political connections to affect both the (public) demand and the (administrative) costs faced by firms. In this set up, we characterize the equilibrium distribution of revenues across firms and the efficiency of public expenditure as a function of the effect of political connections on public procurement and productivity.

[3] A longer account of the characteristics and the historical evolution of Italian local administrations is presented in the working paper version of this paper, Cingano and Pinotti (2009), available at http://sites.google.com/site/paolopinotti/research.

[4] The evolution of public expenditure in Italy over the period 1985-2008, distinguished for central and local Public Administrations, as well as for different categories of expenditure, is shown in Figure A1 of the Web Appendix.

2.2 Preferences and technology

Let C and G denote consumption of private and public goods, respectively. Households have CES preferences over different varieties of private goods, which implies that

$$C = \left[\int B_j^{\frac{1}{\sigma}} Q_j^{\frac{\sigma-1}{\sigma}} dj \right]^{\frac{\sigma}{\sigma-1}}, \tag{1}$$

where Q_j is consumption of variety j and $\sigma > 1$ is the elasticity of substitution among varieties. The latter are produced by a measure J of (monopolistically) competitive firms according to technology:

$$Y_j = A_j f(X_j) \tag{2}$$

where Y_j is the output of firm j, $f(.)$ is a constant returns to scale production function and X_j is the vector of production factors employed by the firm. The (positive) parameters A_j and B_j are productivity and preference shifters, respectively, which may depend, among other things, on the political connections of firm j.

Public goods are produced combining different varieties of private goods according to the following technology

$$G = \left[\int_J \tilde{Q}_j^{\frac{\sigma-1}{\sigma}} dj \right]^{\frac{\sigma}{\sigma-1}}, \tag{3}$$

where $\tilde{Q}_j$ is the amount of each j-th input purchased by the local government. Efficiency in (public) production would require that politicians maximize G subject to the budget constraint; however, political connections may distract public spending from its efficient allocation. We allow this possibility by specifying the following utility function for local politicians:

$$\tilde{U} = \left[\int_J \tilde{B}_j^{\frac{1}{\sigma}} \tilde{Q}_j^{\frac{\sigma-1}{\sigma}} dj \right]^{\frac{\sigma}{\sigma-1}} \tag{4}$$

where $\tilde{B}_j \geq 0$ is a demand shifter that may also depend (analogously to A_j and B_j) on the political connections of firm j.

2.3 Equilibrium

Households and the local government in each region take prices as given and maximize utility subject to the budget constraints $\int_J P_j Q_j dj \leq E$ and $\int_J P_j \tilde{Q}_j dj \leq \tilde{E}$, where E and $\tilde{E}$ are the aggregate expenditure by households and the local government, respectively, and P_j is the market price of variety j. The implied total demand for variety j can be written as

$$Q_j + \tilde{Q}_j = P_j^{-\sigma} \left[B_j \left(\frac{E}{P} \right) + \tilde{B}_j \left(\frac{\tilde{E}}{\tilde{P}} \right) \right] \tag{5}$$

where $P = \int_J B_j P_j^{1-\sigma} dj$ and $\tilde{P} = \int_J \tilde{B}_j P_j^{1-\sigma} dj$ are the price indexes for private and public consumption, respectively. Profit maximization leads firms to charge a constant mark-up

over marginal cost,

$$P_j = \frac{\sigma}{\sigma - 1}\frac{\omega}{A_j}, \tag{6}$$

where ω is also constant across firms within the same market, depending only on the factor prices prevalent in that market. Substituting the last expression into equation (5) delivers the equilibrium revenues of each firm:

$$R_j = \Theta A_j^{\sigma-1}\left[B_j\left(\frac{E}{P}\right) + \tilde{B}_j\left(\frac{\tilde{E}}{\tilde{P}}\right)\right], \tag{7}$$

with $\Theta = \left(\frac{\sigma\omega}{\sigma-1}\right)^{1-\sigma}$.

2.4 The misallocation of public expenditure

According to equation (7), political connections can affect firm-specific revenues through productivity (A_j) and/or preference shifters (B_j and $\tilde{B}_j$). Distinguishing the relative importance of these alternative channels is crucial for assessing the welfare implications of political connections. Intuitively, if connections mainly help firms to overcome burdensome bureaucratic barriers, they could improve the efficiency of the public sector by raising the productivity of input providers. If, on the other hand, they arbitrarily distort public demand in favor of connected firms, this would entail a misallocation of production across heterogeneous input providers.

Formally, the criterion we adopt to evaluate the welfare consequences of political connections is public sector efficiency, as measured by the quantity of goods and services provided by the local government for any given level of public expenditure.[5] Obtaining a closed-form relationship between political connections and public sector efficiency requires imposing some further structure on the model. In particular, we assume that A_j, B_j and $\tilde{B}_j$ are log-normally distributed and their log-mean depends linearly on the political connections of the firm:

$$\ln A_j = a \cdot POL_j + \upsilon_j \tag{8}$$

$$\ln B_j = b \cdot POL_j + \nu_j \tag{9}$$

$$\ln \tilde{B}_j = \tilde{b} \cdot POL_j + \tilde{\nu}_j, \tag{10}$$

where POL_j measures the political connections of firm j, while υ_j, ν_j and $\tilde{\nu}_j$ are zero-mean, normally-distributed error terms.[6]

Then, substituting the demand and supply of inputs to the public administration (equations 5 and 6) into the production function (3), plugging the expressions for shifters

[5] Implicitly, such criterion considers regulations a wasteful burden (e.g. red tape), which is socially efficient for firms to circumvent. On the other hand, some of them (e.g. environmental regulations) may have, at least in principle, a clear social purpose. If this is the case our loss function can be interpreted as a lower bound to the aggregate costs of connections.

[6] The empirical counterparts of the model equations will allow for a richer factor structure of the error terms in (8)-(10).

A, B and $\tilde{B}$, and exploiting the properties of the log-normal distribution delivers the change in public good provision that is due to variation in productivity and demand across firms,

$$\Delta \ln G = \underbrace{aE(POL) + \left(\frac{\sigma-1}{2}\right) a^2 V(POL)}_{greasing\ wheel} - \underbrace{\frac{1}{2\sigma}\tilde{b}^2 V(POL)}_{grabbing\ hand} + \Sigma, \tag{11}$$

where $\Delta \ln G = \ln G - \ln G_0$, G_0 being public good provision absent any supply and/or demand shocks (i.e. $A = \tilde{B} = 1$), and Σ depends on the variance of firm-specific shocks.[7]

Equation (11) shows that positive and negative welfare effects depend on the impact of political connections on firms' productivity and public demand (a and $\tilde{b}$, respectively), weighted by the first and second moments of their distribution across firms. In particular, "greasing wheel effects" increase public expenditure efficiency by raising the average productivity of input providers for the public administration (as captured by the first term on the right hand side); since mark ups are fixed and demand is elastic, this effect would be magnified by the fact that greater shares of total public demand are re-directed toward high-productivity, low-price firms (the second term). "Grabbing hand effects", on the other hand, lower the efficiency of public procurement by distorting the relative demand for each input relative to its optimal level. Note finally that the benefits and costs of political connections are increasing and decreasing, respectively, on the elasticity of substitution σ. Intuitively, the higher the substitutability between different varieties, the greater the advantage of shifting production toward the most efficient firms, and the lower the costs of forcing a disproportionate share of public demand toward some firms.

We conclude this section by detailing our strategy to identify the relevant parameters in equation (11).

2.5 Estimating equations and identification

Our identification strategy will rely mainly on within-firm variation in connection status and outcomes, controlling for transitory local and sectoral shocks. Specifically, let the error term in (8) depend on firm, region-year and sector-year specific shocks,

$$\upsilon_{jt} = a_j + a_{rt} + a_{st} + u_{jt}$$

where the subscripts t, r and s denote years, regions and sectors, respectively, while u_{jt} is a zero-mean random component (the error terms ν_j and $\tilde{\nu}_j$ in 9 and 10 have a similar factor structure). Then, substituting the expressions for A_j, B_j and $\tilde{B}_j$ into the revenues equation (7) and log-linearizing around $A = B = \tilde{B} = 1$ delivers the estimating equation

$$r_{jt} = \phi_j + \phi_{rt} + \phi_{st} + \beta \cdot POL_{jt} + \varepsilon_{jt}, \tag{12}$$

[7] Formally, $G_0 = \left(\frac{\sigma-1}{\sigma}\right) \frac{J^{1/(\sigma-1)}}{\omega} \tilde{E}$ and $\Sigma = \left(\frac{\sigma-1}{2}\right) V(\upsilon) - \frac{1}{2\sigma} V(\tilde{\nu})$.

where r_{jt} is the log of revenues raised by firm j during year t; ϕ_j summarizes firm-specific, time-invariant terms; ϕ_{rt} and ϕ_{st} reflect region- and sector-specific shocks and ε_{jt} is an error term. The coefficient of main interest is β, which is the average percentage change in market power associated with political connections and equals the weighted sum of demand and supply effects,

$$\beta = (\sigma - 1)a + (1 - \tilde{e})\, b + \tilde{e}\tilde{b}, \tag{13}$$

where $\tilde{e} = (\tilde{E}/\tilde{P})/[(E/P) + (\tilde{E}/\tilde{P})]$ is the incidence of public demand over total sales in the market.

Therefore, the equilibrium distribution of revenues across firms is only informative about the existence of any (demand and supply) effect of political connections, but it does not allow to separately identify different types of effects. However, productivity and (public) demand effects of political connections have opposite consequences for welfare, as reflected in the (opposite) sign with which the coefficients a and $\tilde{b}$ enter into equation (11). To separately identify such parameters in (13), we proceed in two steps.

We first exploit the fact that productivity changes affect output for any given level of production inputs, while demand shifts are entirely accommodated by expanding the scale of production. Therefore, keeping constant the factors of production allows us to isolate productivity effects from demand shifts. In fact, taking logs in (2) and substituting the expression for A_{jt}, we obtain

$$y_{jt} = a_j + a_{rt} + a_{st} + a \cdot POL_{jt} + \sum_k \mu^k x_{jt}^k + u_{jt} \tag{14}$$

where x_{jt}^k is the log of each k-th factor employed by firm j during year t and μ^k is its share in total production. Notice that the coefficient of POL_{jt} in (14) depends only on the effect of political connections on firm productivity (as captured by a). Therefore, productivity effects of political connections should drive a positive coefficient of POL_{jt} both in (12) and (14), while demand effects would show up in (12) but not in (14).

The second step consists in distinguishing between different types of demand effects, namely from private consumers and from the public administration, as captured by coefficients b and $\tilde{b}$, respectively. This is also a very important distinction because only the latter cause a distortion of allocative efficiency; the former just redistribute profits across firms active in the market. The relative importance of these two effects can be assessed by comparing estimates of β across different markets. According to equation (13), in fact, if demand effects occur mainly through public procurement, the increase in revenues should be larger for firms operating in markets characterized by a greater incidence of public expenditure in total demand (i.e. a larger $\tilde{e}$ in 13). The opposite would occur if demand effects are driven instead by the preferences of private consumers. Therefore, we will estimate equation (12) separately for firms operating in industrial sectors and/or geographic regions characterized by a different weight of public demand.

3 Data

Our data set consists of a panel (1985-97) of Italian manufacturing firms containing both economic variables and yearly information on connection status. It is obtained combining information from three main sources: firm-level balance sheet data, individual-level social security archives and administrative registries on local politicians.

3.1 Employer-employee data

Our observation sample is an open panel of about 1200 Italian manufacturing firms (INVIND), representative of those with at least 50 employees, surveyed by the Bank of Italy since the early 1970s to monitor investment and employment decisions. The survey was integrated with balance-sheet data on revenues, exports, value added, real output, profits and production factors available since 1982 from the Company Accounts Data Service (CADS), a large data set collected by a consortium of banks to pool information on borrowers.[8]

Firm-level data were further merged with the social security records of all workers employed in an INVIND firm for at least one week over the period 1981-1997; the source of this information are the archives of the Italian social security institute, INPS. In particular, the data report each worker's fiscal identifier, which will be used to classify firms connected to a local administration. The final matched INPS-INVIND employer-employee dataset includes nearly 1.4 millions of individuals employed in 1227 firms.

3.2 Political connections

The system of Italian local administrations comprises 8100 municipalities, 110 provinces (95 until 1995) and 20 regions. The governing bodies are the local council ("consiglio") and the executive cabinet ("giunta"), both of which are renewed through elections regularly held every five years (earlier elections may be called if the mandate is resigned before its term expires). The council is composed by all politicians appointed in the last elections, both with majority and opposition parties, while the executive cabinet is restricted to the mayor and other members of the political majority ("assessori") running the administrative departments.

Within our sample period, local elections were held in 1985, 1990 and 1995, appointing a total of 307,783 local politicians; about 135,000 were in office, on average, during each year. Detailed information on each of them is available from the Registry of Local Politicians (RLP), maintained by the Italian Ministry of Interior and made publicly available according to National Law 267/2000, art. 76. The RLP records include (among other things) the information required to generate the fiscal identifier of each politician:

[8] The CADS collects detailed balance-sheet information on a sample of between 30,000 and 40,000 firms since 1982. The nature of the dataset (help banks' credit decisions) implies the data are carefully quality controlled. Firms in the sample account for approximately half of total manufacturing employment in Italy and for a larger share of sales.

name, birth date and birth place (at the municipality-level). This allowed us to merge the data on local politicians with the employer-employee dataset in order to identify firms' connections with the local government.

In particular, we could track about 11,000 local politicians employed into our sample of firms during the period 1985-1997 (around 0.8% of the workforce).[9] They tend to be older and earn substantially higher wages compared to the rest of the workers. Almost all of them were appointed in municipalities, the vast majority (about 70 percent) being councilors without any direct responsibility into the local executive. Such categories are slightly over-represented, compared to their incidence over the universe of total politicians in Italy. Only a small fraction of connections (less than 4%, and lower than their population share) is determined by Mayors. We will come back to these patterns in Section 4.5 when commenting some of the empirical results.

Based on this information, we classify as connected those firms that have (at least) one employee appointed in a local government during a given year. Since the RLP also reports the party affiliation, we are able to further distinguish between politicians appointed with parties in the majority coalition, which enter the executive cabinet, as opposed to opposition parties. This distinction is useful to explore the differential effect of accessing actual administrative power (as opposed to just being appointed in the local council). While we also discuss results obtained using alternative measures of connections, allowing their strength to vary with the number of appointed employees and the relevance of the connected administrations, dummy variables enhance comparability with previous studies in this area, which rely mostly on binary indicators of political connectedness (e.g. Johnson and Mitton, 2003; Khwaja and Mian, 2005; Knight, 2007; Ferguson and Voth, 2008).

3.3 The characteristics of connected and non-connected firms

Table 1 presents the main characteristics of the firms in our sample, distinguishing by connection status (that is, firms that are always, never or sometimes connected over the sample period). As it should be expected, bigger (smaller) firms are more likely to be always (never) connected through one of their employees, while middle-sized firms (about 40% of the total sample) tend to switch between connection and non-connection status. To increase the homogeneity of the sample, we adopt the optimal trimming approach proposed by Crump et al. (2009): we estimated a logit model for the probability of ever being connected conditional on deciles of initial exmployment and employment growth during the sample period, and eliminated firms with a predicted propensity score smaller than 0.1 or larger than 0.9.[10] The final sample includes 878 firms employing around 500 thousand workers, 3710 of which are identified as local politicians.[11]

[9] See the top panel of Table A1 in the Web Appendix.

[10] The results for the whole sample are very similar and are presented in the working paper version of this paper, Cingano and Pinotti (2009).

[11] Tables A1 and A2 in the Supplementary appendix provide detailed summary statistics on workers, local politicians and firms in the final sample.

Since our identification strategy is mostly based on within-firm changes in connection status, it is important that there is enough variability along this dimension. This seems indeed the case. The average turnover rate is close to 6.5% per year, peaking during the electoral years (1990 and 1995). The number of connected firms is also higher in such years, due to the fact that we counted as connected both firms entering and exiting the connection status. The yearly turnover rate and the total number of connected firms in each year during the period 1986-1996 are shown in Figure 2.

4 Empirical results

This section presents our main empirical results. We first estimate equation (12) to detect whether firm revenues respond to changes in political connections. Focusing on the production function framework (14) allows us to determine to what extent changes in market power can be attributed to the effect of connections on firm productivity (*greasing wheel hypothesis*). Finally, to assess the relative importance of public demand (*grabbing hand hypothesis*), we exploit firms' proximity to public procurement along both sectoral and geographical dimensions.

4.1 Firm revenues

Table 2 reports the estimates of equation (12). The dependent variable is the log of firm revenues deflated using 2-digit industry indexes from the National Accounts. On the right hand side we include indicator variables for the existence of connections between firms and the public administration along with firm, province-year and sector-year fixed effects. Therefore, identification of the effect of political connections exploits within-firm changes conditional on aggregate (demand or productivity) province- and sector-specific transitory shocks.

Baseline estimates. The first three columns of Table 2 distinguish between the effect of connections with all parties represented in the local council as opposed to connections with parties that are represented in the local executive. According to these estimates, only connections established through politicians appointed with the party (or coalition of parties) that enter the local government matter, increasing firm revenues by 5.7% on average (column 1).[12] This effect is blurred and not statistically significant if we include all connections (both with majority and minority parties) as in column (2). Comparing coefficients obtained including both variables at the same time indicates that this is because connections that do not grant access to administrative power do not yield any revenue premium (column 3). For this reason, throughout the rest of the analysis we will focus on connections with parties that are represented in the local government.[13]

[12]Note that, because the specification includes industry-year dummies, these can be interpreted as changes in firm-specific revenues relative to total industry revenues, a commonly used definition of market share.

[13]We also estimated the returns to political connections exploiting only cross-sectional variation in

Threats to identification. In principle, the positive and statistically significant coefficients estimated in columns (1) and (3) could be explained by reverse causality from profit opportunities to the probability of employing a local politician, as well as by other unobserved factors affecting both variables at the same time. One simple reason why this might happen is that fast-growing firms would be hiring workers more intensively than other firms, thus raising the chances of employing a local politician as market power expands (and vice versa). To control for this possibility, in column (4) of Table 2 we allow for firm-specific trends (in addition to firm-specific fixed effects, local and sectoral shocks), which do not affect the results.

Rather than following a linear trend, however, firms-specific changes in profit opportunities could respond to more transitory shocks. As in the previous case, such shocks may induce same-direction adjustments in the labor force, and thus in the probability of being connected.[14] Or, even in absence of employment adjustments, the positive coefficient in column (1) may be driven by firms searching for connections at times when they are more valuable. This might happen, for example, if pursuing the new profit opportunities requires preferential access to permits and licenses. Since elections are not held at high frequencies, then the easiest way to establish a connection in response to such shocks is to hire a politician. To explicitly account for these possibilities, we focus on changes in connection status that are *not* due to workers' turnover. This is first obtained restricting the definition of connections to those established and lost (at year t) through workers who were also employed in the same firm in previous (at least since $t-1$) and subsequent (at least until $t+1$) years. In other words, we excluded those cases in which connection status changes only as a consequence of hiring (or firing) decisions at time t. This alternative definition does not affect the results (column 5). Pushing this argument further, we next restrict to variation in connection status that is due only to individuals employed in the first year the firm entered the sample, i.e. we exclude political connections granted by (possibly endogenous) subsequent worker flows across firms. Even in this case, results are not affected (column 6).[15]

Such results rule out endogeneity concerns due to either firms adjusting their labor force (an thus the probability of employing one politician) or specifically searching for connections in the wake of changing profit opportunities. A different concern is that the correlation between output and political connections picks up the effect of politicians' ability rather than their access to executive power. This would be the case whenever productive human capital and political skills are correlated, a recurrent assumption in the

connection status and revenues, as in many previous papers on the subject. This was obtained taking within-firm averages of both variables and accounting for differences across sectors, provinces and classes of employment. According to those estimates, the revenue-premium from political connections would be more than five times higher than what we obtained exploiting within-firm variation. Such large effects are likely to reflect, to a great extent, spurious correlation between the likelihood of employing a politician and other (possibly unobserved) time-invariant firm characteristics.

[14] Incidentally, note that such reverse causality mechanism would not be compatible with the differential effect of connections through politicians with different access to power showed in columns (1) to (3).

[15] In a similar way, Figures A2 and A3 in the Web Appendix provide visual evidence similar to Figure 1 after restricting the source of variation in firm connections.

literature (see, for instance, Mattozzi and Merlo, 2008). For example, outstanding sales managers permanently raise gross output, independently of other choices; but they might also be more likely to be elected than the average individual. In this case the estimated effect of connection status would be capturing the output consequences of having a brilliant sales manager, irrespective of the connection. We net out these effects adding dummies for the presence in the firm of employees who at some point establish the connection. This implies that β is estimated exploiting the within-firm correlation between output and connection status net of the fixed-effect traceable to specific politician-employees. The estimated effect while in office is qualitatively unaffected (if anything, it increases to 7.4%).

Market share reallocation. All in all, the empirical evidence presented so far is consistent with the hypothesis that $\beta > 0$ in equation (12). Because our regressions are in logs and control for 1-digit industry-year fixed effects, this means that connected firms expand their market share within the industry in which they operate; conversely, such share must decrease, on average, for the other firms within the same industry.[16]

To see this more explicitly, we augmented the right hand side of the estimating equation with the share of connected firms in the same 2-digit industry. This allows to estimate the revenue impact of connections established by potential competitors exploiting within 1-digit industry variation. The estimated coefficient (-0.17, with a standard error of 0.09), indicates that, controlling for common shocks at the 1-digit level, an increase of 10% in the fraction of connected firms in the same 2-digit industry lowers revenues by 1.7 percent, on average. These findings suggest that returns to political connections come at the expenses of other (non-connected) firms operating in the same segment of the market.[17]

Exports and domestic sales. In the last two columns of Table 2 we start distinguishing among alternative channels through which political connections may affect firm revenues. In order to do that, we estimate the baseline specification separately for (the log of) exports and domestic sales. It turns out that the increase in revenues is exclusively due to changes in the latter component, while the effect of political connections on exports is not significantly different from zero.[18] This last finding is consistent with the grabbing hand hypothesis, because domestic sales may possibly depend on purchases from the public administration while exports do not. Moreover, the absence of any effect on exports downplays productivity-based explanations of the effect of political connections, which

[16] These findings are confirmed using more detailed industry breakdown (up to the 4-th digit), see Table A5 of the Web Appendix.

[17] The estimates are reported in Table A5 of the Web Appendix.

[18] Since exports are censored at zero in about 45% of the observations, the dependent variable in column (8) is, more precisely, the log of (1+exports), which is of course still censored. Nevertheless, we estimated the export equation by OLS in order to sweep out fixed effects, which may instead bias non-linear maximum likelihood models (see Greene, 2004). The Logit fixed effect model does also escape the incidental parameters bias through a within-firm transformation, but this comes at the cost of an information loss due to the binary re-coding of the export variable. In any case, OLS, Tobit and Logit estimates convey the same result, namely that political connections do not affect exports (the results for Tobit and Logit are not reported but are available upon request).

according to the heterogeneous-firms-and-trade literature should result in higher sales in foreign markets (see Melitz, 2003; Bernard et al., 2007). Of course, domestic sales and exports are very rough measures of public demand and productivity, respectively. We next turn to examine more systematically these issues.

4.2 Productivity analysis

To what extent is the observed increase in market power attributable to productivity changes? The consequences of political connections for productivity have so far received very limited attention in the literature (one exception in this respect is Khwaja and Mian, 2005). Still, it is crucial to distinguish between efficient and inefficient forms of corruption (and the welfare implications that follow).

We identify productivity-effects by estimating the coefficient of connections in a production function framework, i.e. holding the factors of production constant. Results are reported in Table 3. In the first two columns we augment (12) with measures of production factors. In particular, in column (1) we include on the right hand side the (log of) employment, physical capital and intermediate inputs (along with firm, industry-year and province-year fixed effects). Employment is measured by the total amount of weeks worked by employees during the year, and the capital stock is constructed applying the perpetual inventory method to the investment series. Both revenues and capital series are deflated using 2-digit industry indexes from National Accounts. Our result point to no significant effects of connections on firm productivity. The coefficient of interest is not statistically significant even in column (2), where we adopted a (log) value added specification of the production function (thus excluding intermediate inputs on the right hand side).

Yet, industry-deflated value measures of firm output would reveal productivity only under very stringent conditions. The problem is that, whenever the market power of each firm is non-negligible (as it is the case in oligopolistic markets) idiosyncratic supply shocks induce simultaneous changes in firm-specific output and prices (not captured by aggregate deflators), which in turn bias industry-deflated output measures of productivity downwards; see, for instance, Klette and Griliches (1996) and Foster et al. (2008). Firm-level price data provide a convenient way out of this problem. Information on prices is available for a subsample of our firms. Starting in 1988, the INVIND questionnaire asked firms to report the average sales price change over the previous year, Δp_{jt}. The response rate is 41.3% on average, restricting the sample to 695 firms. Column (3) reports estimates of equation (14) after taking first differences and measuring the log-change of real output as $\Delta y_{jt} = \Delta r_{jt} - \Delta p_{jt}$ (where Δ denotes year-to-year differences). In line with the estimates obtained using value measures of output, political connections have no significant effects on productivity; firm-specific prices are also unaffected by political connections (column 4). Very similar results are obtained when we adopt a more flexible specification that allows the coefficients of production factors to vary across sectors (columns 5 to 8).

Another concern with the last exercise is that the difference between the effect on

revenues and output (Tables 2 and 3, respectively) may descend from differences in the sample and/or measurement error in firm-specific price changes. For this reason, column (9) drops the production factors from the right hand side in order to replicate the specification of Table 2. The effect of political connections on output turns out to be of the same order of magnitude and statistically significant, which is a remarkable result after considering that the sample is less than one third of the original one (Table 2). Column (10) excludes that confounding price effects play any significant role. These findings suggest that missing observations and/or measurement error play little or no role in explaining the absence of an effect on productivity in the other columns of Table 3.

Finally, to account for the potential correlation between unobservable productivity shocks and input levels in productivity regressions we adopted the multi-step estimation procedures devised by Olley and Pakes (1996) and Levinsohn and Petrin (2003). Our findings, available in the Web Appendix, confirm that the effect of political connections on productivity is not statistically significant.

Under general assumptions about technology, the results presented so far allow us to exclude that the increase in revenues experienced by connected firms are driven by greater productivity. If productivity effects were positive, in fact, connections should yield higher levels of output for any given level of factor inputs both under constant and under increasing returns to scale in production; the only difference between the two is that in the latter case positive demand shocks would also result into higher productivity. This evidence is also inconsistent with connected firms accommodating higher demand through greater capital utilization or more hours worked per capita (which are unavailable in our data), in that such adjustments would show up into higher output for the same level of (observed) inputs.

4.3 The social costs of political connections

Combining our previous results suggests that connection-induced increases in revenues reflect positive demand shifts rather than productivity pushes. To distinguish public from private demand shifts, we exploit between-firm heterogeneity as to the weight of sales to the public administration. Ideally, we would want to look at this measure at the firm-level. Unfortunately, neither the INVIND questionnaires nor the balance sheets report this information. We obviate this problem by examining the heterogeneity in the effect of political connections across industrial sectors and geographical areas characterized by a different incidence of public expenditure over total demand. These exercises are reported in Table 4.

The extent of firms' reliance on demand by the public sector largely depends on their specific line-of-work. We thus ranked manufacturing industries according to the ratio of sales to the public sector over total sales, based on the input-output matrix for the Italian economy in year 1992, and construct two binary indicators for sectors above and below the median of such ranking. The average ratio of sales to the public administration over

total sales in the two groups of sectors is 4.5% and 0.3%, respectively, while the average over all sectors is 2.45%.[19] Then, in column (1) of Table 4 we re-estimate the revenue regression interacting the connection status of the firm with each of the two indicators. The results show that the effect is large and statistically significant only for firms operating in industries that rely relatively more on demand by the public administration, while the coefficient is very close to zero for firms that sell their products almost exclusively to private consumers. The Wald test rejects the null hypothesis that the coefficients are equal at the 95% confidence level.

Taken together with the productivity analysis above, these findings suggest that political connections impact on firm revenues only through demand by the public administration (as opposed to firm productivity and/or private demand). In terms of equation (13), $\beta = 0$ whenever $\tilde{e} = 0$, which in turn implies that $a = b = 0$, or

$$\beta = \tilde{e}\tilde{b}. \tag{15}$$

This result is confirmed when we exploit variation in the relevance of public demand across geographical areas (as opposed to industrial sectors). Based on recently issued Italian Treasury data on expenditure by local administrations (*Conti Pubblici Territoriali*) we distinguished firms operating in regions characterized by above- and below-median values of public expenditure over value added in manufacturing. The average of this ratio for the two groups of regions is 31% and 7%, respectively.[20] While the effect of political connections is greater than zero in both groups of regions, its magnitude is more than five times larger in high-expenditure regions (column 2).[21]

These results are consistent with the grabbing hand hypothesis, according to which the private returns to political connections are obtained by distorting the allocation of public expenditure. A first approximation of such distortion is provided by equation (11). We may thus estimate its empirical counterpart by computing $\tilde{b}$ in equation (15)

[19] Specifically, industries were ranked based on the fraction of demand of their products (the "use" coefficient of the input-output matrix) from the PA, Education, Health and Waste sectors. According to this classification, industries highly dependent from public demand include for example basic pharmaceutical products and pharmaceutical preparations, medical and precision instruments, and manufacture of farm products. Among low-dependence industries are textiles, footwear and the manufacture of agricultural products. The list of most and least dependent sectors is presented in Table A4 of the Web Appendix.

[20] Specifically, we computed the average current and capital expenditure in infrastructures (as defined by the Italian Treasury, see http://www.dps.mef.gov.it/cpt/cpt.asp) by Italian local administrations in 1996 and 1997, the first two years for which such data are available. The corresponding figures for industry value added were taken from the Regional Economic Accounts (Conti Territoriali, http://www.istat.it/conti/territoriali). According to these calculations, the high-expenditure regions are Valle d'Aosta, Trentino Alto Adige and Liguria (North), Lazio and Molise (Centre), and Campania, Basilicata, Calabria, Sicilia and Sardegna (South).

[21] Because it includes items other than direct purchases from manufacturing industries, this (geographical) measure of dependence does not capture the incidence of sales to the public administration over total sales as precisely as the (sectoral) measure based on input-output coefficients; in particular, the first measure over estimates the incidence of public demand over total sales. Still, under the assumption that the fraction of public resources directed to manufactures is constant across regions (e.g. it depends only on the "technological", sectoral coefficients), it does adequately capture relative differences in the reliance on public demand across geographical areas

as the ratio of the estimated β (equal to 5.7% in our baseline estimates) over the average ratio $\tilde{e}$ of sales to the public administration over total sales (equal to 2.5% according to the input-output matrix). After plugging the sample variance of connection status (0.25), the baseline estimate of the misallocation of public expenditure implied by political connections depends on the elasticity of substitution only. As plotted in Figure 3, the extent of the loss ranges between 0 with perfect substitutability (i.e. $\sigma \to \infty$, a case in which all varieties are identical and the very concept of misallocation loses significance) to slightly more than 60% when σ tends to 1 (i.e. substituting between different varieties is costly). In an analogous exercise, Hsieh and Klenow (2009) assume an elasticity of substitution equal to 3 (based on estimates by Broda and Weinstein, 2006) which in our case implies a decrease in the provision of public good of about 20% for any given level of public expenditure (relative to the case without political connections).

The same graph also plots the (estimated) degree of misallocation in high- and low-public expenditure regions, which turns out to be greater and lower than in the baseline case, respectively. This is because the ratio between the revenue premium β estimated in high- and low-expenditure regions (approximately 5) exceeds the ratio between the weight of public expenditure $\tilde{e}$ in the two groups of regions (slightly greater than 4), which in turn implies that $\tilde{b}$ in (11) is greater in high- than in low-expenditure regions. Denoting the latter by h and l, respectively, equation (15) implies in fact that

$$\frac{\tilde{b}_h}{\tilde{b}_l} = \frac{\beta_h/\beta_l}{\tilde{e}_h/\tilde{e}_l} > 1. \tag{16}$$

This finding may be interpreted as a disproportionately higher degree of rent-seeking (as captured by $\tilde{b}$) arising in regions where the payoffs from such activities are greater (i.e. public expenditure is higher).

In order to explicitly isolate the role of differences in attitudes toward rent-seeking, in columns (3) of Table 4 we interact connection status with a binary indicator for provinces that lie above and below the median in terms of corruption, as measured by the incidence of political malfeasance among the members of parliament elected in each province over the period 1948-93. This measure was constructed starting from the detailed information collected by Golden (2007) concerning all requests by the Italian judiciary to remove parliamentary immunity in the post-war period.[22] This approach produces a significant overlap with variation in public expenditure, both measures broadly yielding the north-south divide with some relevant exceptions (see Figure A4 of the Web Appendix). Results in column (3) show that the returns to connections are 2 times larger in high corruption areas even though, due to the somewhat large standard errors, the Wald test fails to reject the null hypothesis of equal coefficients.[23]

[22] In order to investigate a legislator for suspected criminal wrongdoing, the Italian constitution required (until 1993) a majority vote by the floor of the relevant chamber to remove immunity. Most of the times such requests were denied.

[23] These findings are unaffected when using an alternative, "missing-expenditure" index of corruption, namely the difference between the cumulative amount of public resources devoted to public works in each

Combining the sectoral and the geographical dimensions confirms that the average estimated effect of connections on revenues is mainly driven by firms featuring both technological proximity to public demand and localization in high-expenditure, high-propensity to official misconduct areas. This can be seen in the last two columns of Table 4, in which we interact connections with the binary indicators for sectoral dependence and for each of the two geographical breakdowns. The estimated coefficient is never statistically significant for firms operating in low-dependence sectors and very close to zero everywhere but in high-public expenditure regions. On the other hand, it is always significant and higher in magnitude (up to five times larger than the average effect) for highly dependent firms located in high expenditure and high corruption areas.

4.4 The private returns to political connections

Having looked at the costs of political connections, we next turn to quantify the private returns accruing to connected firms and employees.

Firm-level returns. In Table 5 we replicate our baseline revenues regression (i.e. the specification of column 1 in Table 2) replacing the dependent variable with alternative measures of profits. The first such measure is Earnings Before Interests Taxes Depreciation and Amortization (EBITDA), which takes non-negative values in almost all observations and can therefore be taken in log, thus favoring comparability with the results for revenues. Estimates in column (1) indicate that firms see a 7% increase in EBITDA in correspondance of the connection period, slightly higher than the increase in revenues. To check whether this result is affected by the different impact of interest payment and depreciation figures, in column (2) we used firms' profits (Earnings Before Taxes, EBT). Since this figure is negative in more than one fourth of cases, it is taken in levels rather than in logs. Results indicate that establishing a connection increases EBT on average by almost 500 thousands euros with respect to the baseline scenario. This amounts to around one-tenth of a (within-firm) standard deviation, in line with the relative magnitude of the baseline revenue premium. In column (3) we look at profitability as measured by the Return on Asset (ROA). According to our estimates, the latter increases by more than 0.8 percentage point in connected firms, or one-tenth of a standard deviation. Regressions of income and total tax rates paid out by the firm, reported in columns (4) and (5), confirm that higher profitability descends directly from changes in revenues rather than from lower taxes. This is consistent with the fact that taxes in Italy are largely beyond the control of local politicians.

In the last two columns of the table we use yearly wage and employment data to show that (perhaps unsurprisingly) there are no gains from connections in terms of average wages paid to employees. This is true irrespective of the wage and employment data source used:

province and the physical quantities of realized infrastructures (after controlling for other determinants of the costs of construction), as computed by Golden and Picci (2005). The rationale of this approach is that, keeping constant the technological determinants of production costs, the residual of public expenditure per unit of infrastructure can be attributed to bribes and other forms of corruption (see also Olken, 2009)

both social security (INPS) firm-level data on yearly wages and weeks worked (column 6) and balance sheet (CADS) data on labor compensation and number of workers (column 7) strongly indicate the absence of any effect of connections on average wages. While this is totally plausible in the aggregate, competition for political connections in the labor market should command higher wages for appointed employees.

Individual-level returns. Employment-based connections are peculiar in that individuals granting them are not residual claimants on firm profits. In principle, it is therefore not clear why politician-employees should care at all about improving firm performance. In practice, however, there are several ways in which they could be remunerated by firm owners for granting the connection. This opens the question of why politicians should grant an advantage to the firm they are employed in instead of "selling" it among its competitors. Indeed, the existence of a formal employment relationship could facilitate the remuneration of politicians by firm owners, either through higher than market wages and/or other types of private benefits. As long as workers can move freely between one firm and the other, there should actually exist a "market" for political connections, commanding higher compensations for individuals appointed in local governments.

The information contained in the Social Security archives allow us to partially explore this issue. For each worker-firm relationship they report total yearly earnings paid to the worker along with the number of weeks worked. This measure of earnings covers both monthly wages and yearly allowances (as Christmas or holiday bonuses), but totally or partially excludes other types of compensations such as fringe benefits, bonuses, equity compensation plans, etc. Clearly (and most importantly) it does not include cash-in-hand and other forms of payment eluding tax and Social Security contributions. With these caveats in mind, we investigate whether the wage pattern of individuals appointed in local governments differs from that of other employees.

Figure 4 plots the dynamics of average wages of appointed workers relative to that of other employees around the election year (indicated by the 0 on the horizontal axis).[24] Specifically, the figure plots sub-group averages of the residuals from a (log) wage regression on age and tenure profiles, year effects and individual fixed-effects. The latter are meant to absorb all time invariant individual differences (as gender, education and ability) that might influence wage profiles as well as the probability of election. The graph provides several important insights. First, while the pre-election dynamics of the wages of would-be administrators does not seem to differ significantly from that of other employees, the two diverge after appointment.[25] Second, the wage differential persists over time and does not revert to the baseline even after a substantial number of years, suggesting that local politicians may be climbing on a higher wage ladder after appointment.

[24] Nearly 500 thousand workers were employed by firms in our trimmed sample over the 1985-97 window, more than 4200 of whom turned out to be appointed in a local public administration with the majority coalition.

[25] The increase in individual wages after appointment is not immediate, as it was the case instead for firm revenues in Figure 1. This is probably due to the existence of greater frictions and adjustment costs in labor markets relative to goods' markets.

To quantify these effects, we augment the wage regression with indicators for political careers; the results are reported in Table 6. Column (1) includes on the right hand side a dummy taking value 1 in all years following the appointment of the individual in a local government (Post Election). The estimated coefficient indicates an average shift in the wage profile of nearly 3.5 percent following the election. Figure 4 suggests that this increase reflects a steeper wage profile over the post-election period. For this reason, in columns (2) and (3) the dummy Post Election is interacted with linear and quadratic terms for the number of years after appointment. The results show that the linear spline specification best captures the diverging pattern of politician-employees relative to the other workers in our sample. Such findings are unaffected as we control for potential confounding factors arising from mobility of workers across firms. By focusing on changes in individual wage profiles, in fact, our results might be driven by the fact that local politicians systematically move toward high wage firms. We account for this possibility estimating our wage equation accounting for individual-firm (i.e. match) fixed effects; the results are reported in columns (4) to (6).

Of course, the size of the wage premium (about 4 percentage points 7 years after appointment) is not comparable, in absolute value, to the monetary gains accruing to the firm. Still, its existence is indicative of competition for political connections. Precisely quantifying the intensity of such competition would require information on all (possibly unofficial) compensations, which unfortunately go much beyond the scope of Social Security archives.

4.5 Number and level of connections

Our findings are largely consistent with the existence of significant private returns and social costs of connections between firms and local governments. In principle, the magnitude of such effects could vary with the number and the level of connections, for example those established with large administrations, powerful politicians or by high-rank workers.

We begin by examining whether there are incremental effects of being connected through more than one politician. To this purpose, for each firm we counted the number of connections with majority politicians and generated four dummy indicators corresponding to each quartile of the distribution of such variable. These identify firms connected through one, two, three and four or more politicians, respectively. The results obtained using these dummies as indicators of connection, reported in the first column of Table 7, suggest that the revenue premium is in fact increasing in the number of connections, reaching 10% for firms in the third quartile (i.e. those with 3 connections); there do not seem to be additional gains from connecting through four or more individuals, though.[26]

Are all connections equally relevant? The first dimension that we examine in this respect is the size of the connected administration(s), as larger administrations should give

[26]Notice that, because the count of connections allow to exploit additional dimensions of variation with respect to the baseline exercise - e.g. an already connected firm gaining one additional connection - these coeffcients are not directly comparable with those reported in previous pages.

access to a larger amount of public resources. We merged our data with local population registries and computed the total population of all administrations each firm is connected to. As before, we then estimated the revenue premium for firms in each quartile of the distribution of such variable (column 2). Interestingly, the results point at the existence of a hump-shaped relationship between total connected population and firm returns. The latter increase in fact up to the third quartile of the distribution of connected population (about 10,000 individuals), to decline sharply in the last quartile.

Since the total connected population depends both on the average size and on the number of administrations each firm is connected to, taking the results in columns (1) and (2) together suggests that the returns are non-monotonic also in the average size of the connected administration. This is actually confirmed in column (3), which performs a similar exercise starting from the distribution of average (as opposed to total) population in the connected administrations. The estimated returns reach a maximum in the third quartile (indicating connectioins to administrations averaging 4,500 inhabitants); it is smaller, and not statistically significant, for firms connected with the largest administrations.

One interpretation of these findings is that greater exposure prevents excessive rent-seeking by politicians appointed in the largest administrations. For instance, it seems reasonable to expect that the private business of politicians in bigger cities would attract more attention by the public opinion, the media, etc. This is also in line with recent evidence from Ferraz and Finan (2008, 2011) that higher exposure to local media plays a relevant role in promoting political accountability and significantly reduces local governmental corruption practices.

By the same argument, the role and visibility of politician-employees, both inside the firm and in the political arena, should also non-linearly affect the returns to political connections. The last two columns of Table 7 provide some evidence in this respect.

In column (4) we report estimates obtained including three dummies indicating the firm being connected to (at least) one councilor appointed with the majority, a member of the executive or the head of the local government (the Mayor). These are of course non-mutually exclusive events, for firms that are connected through more that one employee. We find that both connections through majority councilors and through members of the executive induce large and statistically significant increases in revenues, comparable to those obtained in our baseline estimates. On the other hand, connections with city mayors, who are the most visible politicians at the local-level (possibly the only ones known among people at large) have a non statistically significant (and negative in sign) effect on revenues.

In column (5), we consider possible differential effects along the firm hierarchy. In particular, we distinguish between connections established through employees at different quartiles of the within-firm initial wage distribution.[27] The results in column (5) tend

[27]Notice that, as in the previous case, a firm could be connected through two or more workers occupying different positions in this ranking. Notice also that we focus on the initial distribution of earnings, i.e. the distribution in the first year the firm is present in the sample, to avoid the confounding factor of shifts in the individual wage of politician-employees (after the change in connection status) described in Figure 4 and Table 6.

to confirm the previous patterns. The returns increase for connections up to the third quartile of the wage distribution (for which it is statistically significant at the 10% level) but decreases again for highest wage workers.

All in all, the results in Table 7 point at the existence of a non-monotonic relationship between firm returns to political connections and the rank of politicians and employees. Up to some point, more political power and a higher rank inside the firm make for a greater effectiveness of connections; on the other hand, they may come at a cost in terms of exposure, which in turn might reduce the benefits for firms connected through the most visible individuals.

4.6 Selection bias

We finally discuss the possibility that the returns to political connections vary across firms along (possibly unobserved) dimensions that are systematically related to the probability of connection. In this case, our estimates would not be representative of the average returns to political connections even in the absence of other endogeneity issues (as those discussed in section 4.1). Such concern is common to most previous studies using personal relationships as a measure of connection (see, for instance, Khwaja and Mian, 2005; Faccio et al., 2006; Ferguson and Voth, 2008). In particular, cross-sectional estimates of the returns to connection would be biased upwards in the (likely) case that high-return firms select into connection status.

Because our estimates exploit within-firm variation in connection status, they would rather be biased toward the returns of firms characterized by a higher probability of *switching* status. Clearly, high-return firms are likely to be more active in establishing links with the public administration, increasing the probability of switching (from non-connection to connection); but they might also devote more efforts to maintaining such connections, thus decreasing the probability of switching (from connection to non-connection). Hence, the direction of the bias is a priori unclear in our case, and depends on the relation between (unobserved) returns and the probability of switching connection status.

In our data, the probability of switching turns out to be *negatively* correlated with (sector-level measures of) the dependence on public demand. Based on the results in Section 4.3, the latter constitute an observable measure of differences in the potential returns to political connections, which are on average higher in more dependent sectors (see Table 4). Assuming they also represent a good proxy for unobserved firm-specific returns, and given that within-firm estimates put a disproportionate weight on the sub-sample of switching firms (relative to their share over the total population), our results should if anything be seen as a lower bound of the average returns in the entire sample.[28]

[28] Clearly, dependence on public demand may neglect many (possibly unobserved) dimensions along which returns to political connections might differ. Yet, we see it as unlikely that turnover will be correlated with returns in a different way when heterogeneity is due to observed versus unobserved factors.

5 Conclusions

Connections between firms and the public administration are widespread throughout most countries in the World. The advantages granted by such linkages, in terms of market power and profits, are often criticized on both ethical and efficiency grounds. Our analysis deals with the second dimension, asking in particular whether the existence of political connections conditions the efficiency of public sector activity.

Our results confirm that this is the case. We find that greater market power experienced by politically connected firms is not driven by higher productivity; rather, it is propped up by greater sales to the public administration. These gains are larger the higher the degree of corruption. Such findings suggest that political connection may entail significant aggregate economic losses. At the same time, they also suggest that the severity of these losses depends strongly on the set of external conditions present in each economy.

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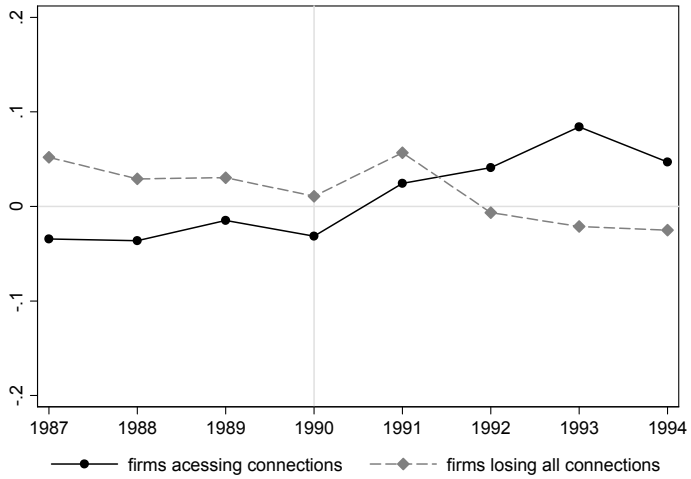
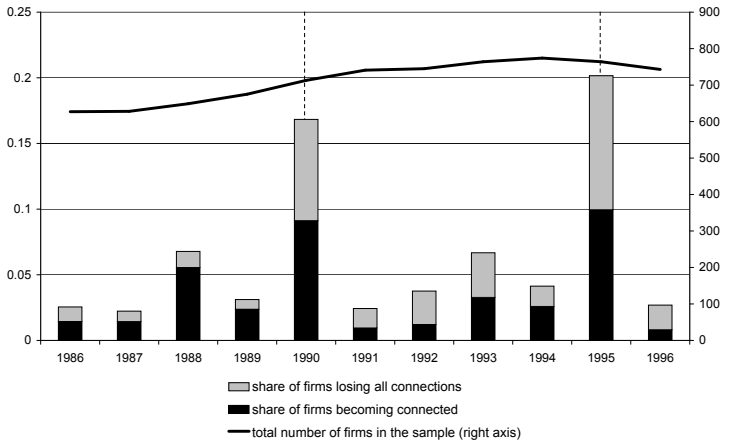
Figure 1: changes in firm revenues and connections with the majority coalition in the local public administration, before and after the local elections in 1990



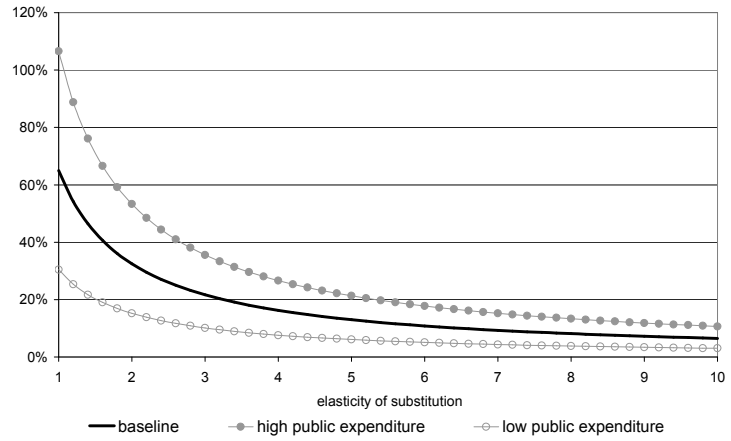
Note: The figure plots averages of the residuals of a regression of the log of yearly revenues on firm, sector-year and province-year fixed effects. Averages are computed for the group of firms accessing (solid line) and losing (dashed line) connections to local administrations as a consequence of 1990 elections. Firms accessing a connection are those experiencing the appointment of (at least one) employee with the majority party (or coalition of parties) that form the local government. Firms in the second group are those that in 1990 lost all connections held before the elections.

Figure 2: turnover in connection status and number of connected firms, years 1986-1996



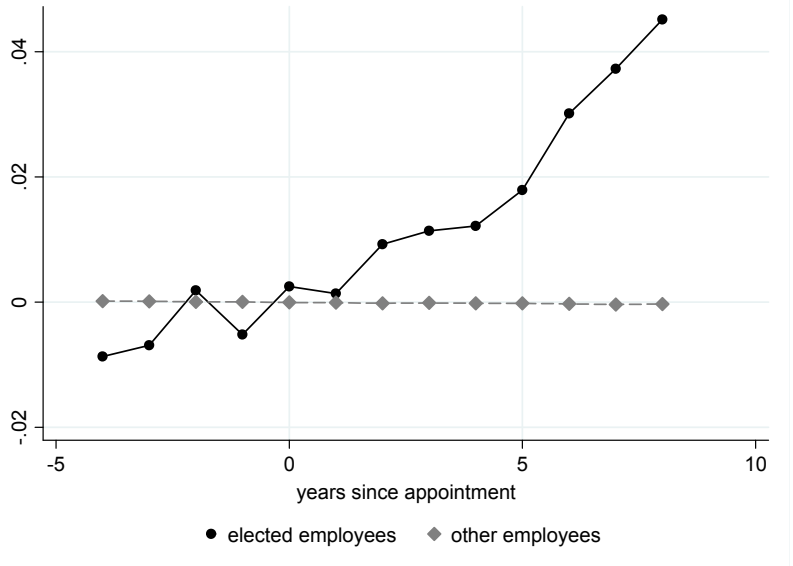
Note: This graph shows the fraction of firms switching connection status and the number of connected firm in each year. The dotted vertical lines indicate the electoral years.

Figure 3: estimated degree of misallocation of public expenditure, conditional on the elasticity of substitution across firm varieties and the incidence of public expenditure over value added in manufacturing



Note: This graph shows the estimated degree of misallocation of public expenditure due to political connections, as measured by the lower provision of public goods implied by equation (11). Both average and area-specific effects are reported. High and low public expenditure areas include regions above and below the median in terms of public expenditure over total value added in manufacturing, respectively, based on the Italian Regional Economic Accounts.

Figure 4: individual wages before and after appointment in a local public administration



Note: This figure shows the average change induced by appointment in a local government on individual (log) weekly wages. In particular, the solid line graphs the residuals of a regression of the log wage on a polynomial in age, individual and year fixed effects, averaged over all individuals ever appointed in a local government around the year of appointment (year=0). The dashed line graphs the same average for individuals never appointed in a local government.

Table 1: the characteristics of firms in the INPS-INVIND employer-employee data (by connection status), years 1985-1997

	SUMMARY STATISTICS				DISTRIBUTION		
	mean	std. dev.	between	within	10^{th} pc.	50^{th} pc.	90^{th} pc.
all sample: 1,227 firms, 12,547 observations							
Total revenues, ths. €	90,273	486,623	442,100	91,451	5,802	23,942	169,000
Value added, ths.€	24,610	110,894	101,527	28,200	1,939	7,256	46,931
Exports, ths.€	22,303	161,926	141,355	53,947	0	934	36,152
Workers	895	2,473	2,373	386	113	355	1,708
always connected: 513 firms, 5,041 observations							
Total revenues, ths. €	183,287	756,723	672,939	143,479	11,384	58,561	374,841
Value added, ths.€	49,662	171,456	153,609	44,230	3,662	17,836	95,509
Exports, ths.€	47,304	252,907	216,054	84,629	0	5,569	94,281
Workers	1,741	3,725	3,508	605	210	815	3,289
connected in some years: 426 firms, 4,766 observations							
Total revenues, ths. €	31,966	42,624	42,605	14,075	5,882	19,257	70,751
Value added, ths.€	8,997	11,227	10,589	4,612	1,994	5,748	18,760
Exports, ths.€	6,219	14,111	13,329	8,020	0	300	17,000
Workers	397	362	348	59	116	301	781
never connected: 288 firms, 2,740 observations							
Total revenues, ths. €	20,570	33,534	39,017	9,138	3,956	10,549	43,641
Value added, ths.€	5,676	8,866	10,158	2,398	1,382	3,219	10,918
Exports, ths.€	4,285	11,554	11,297	6,291	0	0	11,756
Workers	206	178	180	28	84	159	381

Note: This table reports the average characteristics of the firms in our sample, distinguishing also among the subgroups of firms that are always, sometimes and never connected, respectively. The symbol (ths.) € denotes variables expressed in constant 1991 Italian liras and then converted into (thousands of) euros at official exchange rates.

Table 2: the effect of political connections on revenues, fixed effects panel regressions controlling for local and sectoral shocks, years 1985-1997

	DEPENDENT VARIABLE: LOG OF YEARLY FIRM REVENUES								
	baseline estimates			*firm specific trends*	*only tenured workers*	*exclude worker flows*	*control for individual ability*	*only export markets*	*only domestic market*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
connected, with the majority coalition	.057***		.082**	.049***	.063***	.072***	.074**	-.065	.055**
	(.021)		(.034)	(.017)	(.021)	(.027)	(.033)	(.152)	(.024)
connected, with any party		.030	-.035						
		(.020)	(.033)						
observations	9139	9139	9139	9139	7820	7820	7820	9142	9112
firms	878	878	878	878	878	878	878	878	878
R^2 (within)	.308	.307	.309	.608	.286	.286	.286	.231	.217

Note: The unit of analysis are firm-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variable in columns (1) to (7) is the log of total yearly revenues, while columns (8) and (9) restrict to exports and domestic sales, respectively; all variables are deflated using industry-level indexes from the Italian National Accounts. The explanatory variables are binary indicators for the firm employing at least one local politician in a given year and are constructed merging the INPS-INVIND data to the Italian Registry of Local Politicians. All regressions include firm, province-year and sector-year fixed effects. In columns (4) to (7) the baseline specification is changed as follows: column (4) includes in addition firm-specific trends; in column (5) connections with employees entering or exiting the firm in the same year are excluded; in column (6) connections are computed based on the sample of workers already employed in the firm in the first year of the sample period; column (7) adds to the specification two dummy variables for the presence in the firm of employees that will or have been appointed in a local public administration with the majority coalition. Robust standard errors clustered by firm are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 3: the effect of political connections on firm revenues, value added, output and prices, fixed effects and first difference panel regressions controlling for production inputs and for local and sectoral shocks, years 1985-1997

DEP. VARIABLE:	r	va	Δy	Δp	r	va	Δy	Δp	Δy	Δp
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
connected	-.0002	.015			.002	.012				
	(.006)	(.020)			(.006)	(.020)				
Δ connected			.004	.0001			.002	-.0002	.032**	.002
			(.008)	(.005)			(.008)	(.005)	(.014)	(.005)
					control variables					
$\ln L$	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
$\ln K$	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
$\ln X$	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
$\Delta \ln L$	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO
$\Delta \ln K$	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO
$\Delta \ln X$	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO
restricted coeff.	YES	YES	YES	YES	NO	NO	NO	NO		
firm FE	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
obs.	7343	7296	2942	2944	7343	7296	2942	2944	2942	2944
firms	695	695	665	667	695	695	665	667	665	667
R^2 (within)	.936	.494	.741	.1	.941	.502	.752	.109	.036	.08

Note: The unit of analysis are firm-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variable is reported on top of each column. r and va are the log of yearly revenues and value added at the firm level, respectively, deflated with industry-level indexes from the Italian National Accounts. Δy and Δp are the log difference, between year t and $t-1$, of real output and prices at the firm level. The main explanatory variable is a binary indicator for the firm employing at least one individual appointed in a local public administration with the majority coalition and is constructed merging the INPS-INVIND data to the Italian Registry of Local Politicians. The table reports also the control variables included in each column: $\ln L$ is the log of labor employed by the firm, expressed in terms of worker-weeks; $\ln K$ is the log of capital, reconstructed using the perpetual inventory method; $\ln X$ is the log of value of intermediate inputs. Δ denotes the first difference of each explanatory variable. The coefficients of all control variables are restricted to be equal across sectors in columns (1) to (4); they are sector-specific in columns (5) to (8). All regressions include province-year and sector-year fixed effects, firm fixed effects are included in all but the first difference regressions. Robust standard errors clustered by firm are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 4: the effect of political connections on firm revenues across different industries and areas, fixed effects and panel regressions controlling for local and sectoral shocks, years 1985-1997

DEPENDENT VARIABLE: LOG OF YEARLY FIRM REVENUES								
	single interactions				**double interactions**			
EXPLANATORY VARIABLE: CONNECTION STATUS INTERACTED WITH HIGH AND LOW LEVELS OF								
	sectoral dependence	*regional public exp.*	*provincial corruption*	*sectoral dependence*	*regional publ. exp.*		*corruption*	
					HIGH	LOW	HIGH	LOW
	(1)	(2)	(3)	↓	(4)		(5)	
HIGH	0.094***	0.200*	0.085*	HIGH	0.273*	0.073***	0.124**	0.079**
	(0.030)	(0.104)	(0.047)		(0.166)	(0.028)	(0.062)	(0.032)
LOW	0.011	0.041**	0.046**	LOW	0.106	-0.00005	0.015	0.010
	(0.0258)	(0.020)	(0.023)		(0.071)	(0.026)	(0.050)	(0.028)
Wald test for the equality of the coefficients across different sectors and regions								
p-value	0.023	0.134	0.457	p-value	0.103		0.096	
obs.	9131	9130	9130		9122		9122	
firms	878	878	878		878		878	
R^2 (within)	0.309	0.309	0.308		0.310		0.309	

Note: The unit of analysis are firm-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variable is the log of total yearly revenues deflated using industry-level indexes from the Italian National Accounts. The explanatory variables are interactions between a binary indicator for the firm employing at least one individual appointed in a local public administration with the majority coalition, constructed merging the INPS-INVIND data to the Italian Registry of Local Politicians, and binary indicators for the the industry and area in which the firm operates. In column (1) connection status is interacted with binary indicators for firms operating in industrial sectors above and below the median in terms of sales to the public administration over total sales, respectively, based on the 1992 input-output matrix of the Italian economy; in column (2) it is interacted with binary indicators for firms operating in regions above and below the median in terms of public expenditure over total value added in the manufacturing sector, respectively, based on the Italian Regional Economic Accounts; in column (3) it is interacted with binary indicators for firms operating in provinces above and below the median in terms of corruption, respectively, based on judicial allegations for misbehavior against the members of parliament elected in each region. Columns (4) and (5) present the results of regressions that interact connection status with the measure of sectoral dependence on public demand and with regional and provincial characteristics (weight of public expenditure and corruption, respectively). The table does also report the p-value of the null hypothesis that the difference between the coefficients in each column is not statistically significant; in columns (4) the difference between the coefficients of the interaction with high sectoral dependence - high regional expenditure and low sectoral dependence - low regional expenditure is tested (analogously in column 5 for sectoral dependence and corruption). All regressions include firm, province-year and sector-year fixed effects. Robust standard errors clustered by firm are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 5: the effect of political connections on firm profits, taxes and salaries, fixed effects panel regressions controlling for local and sectoral shocks, years 1985-1997

DEP. VARIABLE	PROFITABILITY			TAXES		WAGES	
	lnEBITDA	*EBT*	*ROA*	*income*	*total*	*INPS*	*CADS*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
connected,	.070*	474.262**	.831**	-.026	-.034	.001	.010
with the majority	(.039)	(219.688)	(.372)	(.037)	(.038)	(.003)	(.009)
obs.	8215	9142	9142	9124	9124	8985	9073
firms	861	877	877	876	876	865	877
R^2	.26	.116	.236	.187	.182	.98	.85

Note: The unit of analysis are firm-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variables, indicated on top of each column, are alternative measures of firm profits (columns 1-3), taxes (columns 4-5) and salaries paid by the firm (columns 6-7). *EBITDA* are earnings before interests, taxes, depreciation and amortization, *EBT* are earnings before taxes and *ROA* is return on assets. Income and total taxes are computed as a ratio over *EBT*. *INPS* and *CADS* refer to the two alternative sources of information on wages, the social security institute and the Company Accounts Data Service, respectively; the specifications in columns (6) and (7) also include on the right hand side the log of weeks worked and the log of employees in each firm, respectively. All regressions include firm, province-year and sector-year fixed effects. Robust standard errors clustered by firm are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 6: the effect of political connections on individual wages, panel regressions controlling for individual and individual-firm fixed effects, years 1985-1997

	DEPENDENT VARIABLE: LOG OF REAL WEEKLY WAGE					
	individual FE			*individual × firm FE*		
	(1)	(3)	(3)	(4)	(5)	(6)
age/10	0.394***	0.394***	0.394***	0.391***	0.391***	0.391***
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)
$(age/10)^2$	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Post Election	0.034***			0.034***		
	(0.006)			(0.006)		
Trend×Post/10		0.091***	0.076***		0.090***	0.075***
		(0.013)	(0.025)		(0.013)	(0.025)
$(Trend \times Post/10)^2$			0.021			0.021
			(0.026)			(0.026)
Obs.	4650011	4640253	4640253	4650011	4640253	4640253
R^2 (within)	0.162	0.162	0.162	0.162	0.162	0.162

Note: The unit of analysis are individual-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variable is the log of weekly wages, deflated using the consumer price index from the Italian National Accounts. *Post Election* is an indicator variable for the individual j having been appointed in a local government with the winning coalition in some previous period and $Trend$ is the number of years since appointment (if any), so $Trend \times Post$ $(Trend \times Post)^2$ are linear and quadratic trends starting the year of appointment. In addition to the quadratic wage-age profile, all regressions control also for wage-tenure profiles (coefficients not reported for brevity), as well as for individual fixed effects (columns 1-3) and individual-firm interactions (columns 4-6). Robust standard errors clustered by individual are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 7: the effect of the number and type of political connections on revenues, fixed effects panel regressions controlling for local and sectoral shocks, years 1985-1997

	DEPENDENT VARIABLE: LOG OF YEARLY FIRM REVENUES				
CONNECTED TO:	*number of connections (1,2,3,4+)*	*connected population (total)*	*connected population (average)*	*role of connected politician*	*role of connected employee*
	(1)	(2)	(3)	(4)	(5)
IV quartile (top)	0.103**	0.056*	0.041		-0.011
	(0.048)	(0.033)	(0.028)		(0.025)
III quartile	0.101***	0.091***	0.075**		0.043*
	(0.035)	(0.028)	(0.030)		(0.024)
II quartile	0.087***	0.057**	0.056***		0.031
	(0.029)	(0.028)	(0.028)		(0.025)
I quartile (bottom)	0.46**	0.031	0.066**		0.011
	(0.023)	(0.030)	(0.033)		(0.021)
DISTRIBUTION OF:	*Count of connections per firm*	*Total connected population*	*Average connected population*	-	*Within firm wages*
connected through a Major,				-0.038	
				(0.043)	
a member of the executive				0.019	
				(0.023)	
or a member of the council				0.051**	
				(0.020)	
obs.	9139	9139	9139	9139	9139
firms	878	878	878	878	878
R^2 (within)	0.309	0.309	0.309	0.309	0.309

Note: The unit of analysis are firm-year observations in the INPS-INVIND employer-employee data over the period 1985-97. The dependent variable is the log of total yearly revenues, deflated using industry-level indexes from the Italian National Accounts. The explanatory variables are alternative measures of political connections, constructed merging the INPS-INVIND data to the Italian Registry of Local Politicians and to registries of municipal population. In column (1) we compute the distribution of the number of political connections across firms, where a connection means having at least one local politician appointed with the majority coalition employed in the firm, and include on the right hand side a set of binary indicators for the firm belonging to each quartile of such distribution; in column (2) we compute the total population living in the local administrations each firm is connected to and include on the right hand side a set of binary indicators for the firm belonging to each quartile of the distribution of connected population; in column (3) the quartiles refer instead to the distribution of the average population living in the connected administrations; column (4) distinguishes the effect of connections through local politicians with a different role inside the local public administration; finally, column (5) distinguishes the effect of connections through employees in each quartile of the distribution of yearly earnings inside the firm. All regressions include firm, province-year and sector-year fixed effects. Robust standard errors clustered by firm are reported in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.