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POLITICIANS AT WORK.
THE PRIVATE RETURNS AND SOCIAL COSTS OF POLITICAL CONNECTIONS

by Federico Cingano* and Paolo Pinotti*

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% 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 25%) 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%.

JEL Classification: D21, D73, H72, J31.
Keywords: political connections, social welfare, productivity.

Contents

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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, 2006a). The mechanisms inducing the (expected) profits of connected firms to raise are largely unexplored, however, and can in principle bear very different implications in terms of 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.

This is the first paper to examine the real effects of political connections in product 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 and profits, 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 of their employees with administrative archives on the universe of Italian local politicians over the period 1985-97.[1]

Detailed firm-level data provide several advantages for the purpose of this work. First, they allow to identify connections on the basis of precise links between firms and politicians. In particular, we will define as connected those firms employing (at least) one individual appointed in a local government. This is a meaningful definition because, differently from the national members of parliament, most Italian local politicians retain other occupations alongside their political career. Moreover, despite being much less monitored than their national-level colleagues, they manage directly over one third of the total public budget (and retain much discretionary power over the allocation of the remaining part). 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 approximately 5%, yielding to an almost equivalent change in current profits (Figure 1).

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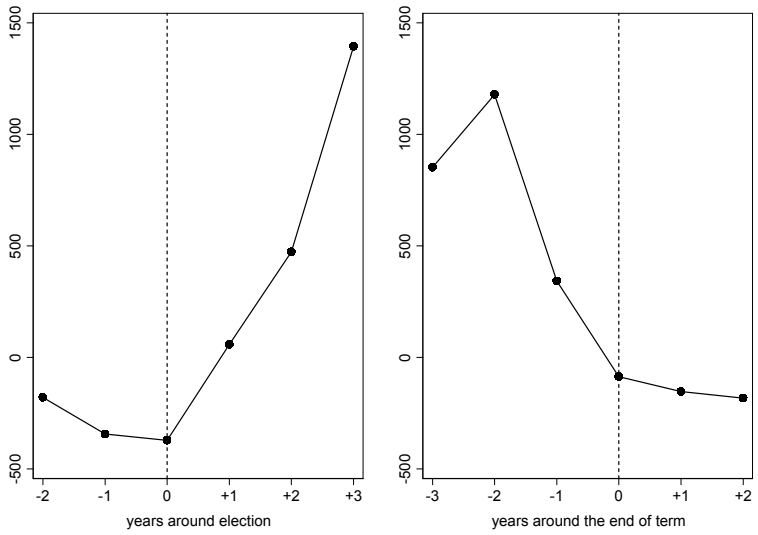
[1] In accordance with confidentiality requirements, the dataset was assembled using a computer code that automatically merges and encrypts the records contained in the original archives.

These gains *only* accrue to firms establishing a connection through politicians appointed with the party (or coalition of parties) that won the elections: firms connected through other politicians 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.

Figure 1: political connections and profits



Note: These figures show the average difference between connected and non-connected firms' profits, expressed in constant 1991 Italian liras and then converted into thousands of euros at official exchange rates. The figure on the left plots the residuals of a regression of profits on firm, province-year and sector-year fixed effects, averaged over politically connected firms around the year in which they get access to at least one connection (year=0). The figure on the right plots the same variable for firms losing all their 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). Whether such a channel entails a social cost is not clear, however. 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; 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 alternative explanation is labeled *grabbing hand hypothesis*, after Shleifer and Vishny (1998).

Our evidence is largely consistent with this second hypothesis. In particular, estimates from alternative production function specifications indicate that political connections do not have any impact on productivity. Rather, the average effect on revenues turns out to be driven by firms operating in markets in which public demand plays a major role. Specifically, it is entirely due to changes in domestic sales (as opposed to exports) and to firms operating in sectors that are intensive providers of inputs to the public administration (7.1%), and it is larger in regions characterized by high public expenditure (16.1%) and high corruption (9.2%). The reallocation of market shares in favor of connected firms can be associated in our framework to a reduction of around 20% in the provision of public goods, compared to a scenario with no or ineffective political connections.

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, 2006a; 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 rather focus on a direct measure of political connections and depart from the event study approach. In both respects, 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 Sections 4 we present the empirical results. Finally, Section 5 concludes.

2 Theoretical framework

Consider an economy inhabited by households, firms and a local government. Households value consumption of both private and public goods. The former are produced by monopolistically competitive firms, while public goods are provided by the local government using the varieties of private goods as inputs. Public procurement of these varieties may respond to the existence of political connections between private firms and the local government. In this set up, we will characterize firm revenues and the efficiency of public

[2] Faccio (2006b) 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.

expenditure as a function of the distribution of political connections across firms and we will derive estimating equations from these relationships.

2.1 Preferences and technology

Let C and G denote consumption of private and public goods, respectively. Specifically, 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 between 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. Political connections may however distract public spending from its efficient allocation, i.e. the one that maximizes G. 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.

2.2 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 is then

$$P_j \left(Q_j + \tilde{Q}_j \right) = P_j^{1-\sigma} \left[B_j \left(\frac{E}{P} \right) + \tilde{B}_j \left(\frac{\tilde{E}}{\tilde{P}} \right) \right] \tag{5}$$

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

2.3 Estimating equations and identification

According to equation (7), political connections can affect firm-specific revenues only through productivity and/or preference shifters. Distinguishing the relative importance of these alternative channels is crucial for assessing their welfare implications. Our identification strategy will rely mainly on within-firm variation in connection status and outcomes, controlling for transitory local and sectoral shocks.

Specifically, let A, B and $\tilde{B}$ depend on political connections in the following way:

$$\begin{aligned} \ln A_{jt} &= a_j + a_{rt} + a_{st} + a \cdot POL_{jt} + \upsilon_{jt} \\ \ln B_{jt} &= b_j + b_{rt} + b_{st} + b \cdot POL_{jt} + \nu_{jt} \\ \ln \tilde{B}_{jt} &= \tilde{b}_j + \tilde{b}_{rt} + \tilde{b}_{st} + \tilde{b} \cdot POL_{jt} + \tilde{\nu}_{jt}. \end{aligned}$$

where the subscripts $t = 1, 2, ..., T$ indicates years. The first term on the right hand side of each equation summarizes firm-specific, time-invariant characteristics; the second and third terms capture, respectively, year t shocks specific to region r and industrial sector s in which the firm operates; and υ_{jt}, ν_{jt} and $\tilde{\nu}_{jt}$ are normally distributed error terms not correlated with political connections. Coefficients a, b and $\tilde{b}$ represent the (percentage) effect of political connections on firm-specific productivity and demand (either private or public).

Substituting the expressions for A_j, B_j and $\tilde{B}_j$ into the revenues equation (7) and log-linearizing it around $A = B = \tilde{B} = 1$ delivers the estimating equation

$$r_{jt} = \phi_j + \phi_{rt} + \phi_{st} + \beta \cdot POL_{jt} + \varepsilon_{jt}, \tag{8}$$

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 estimating coefficient β in (8) is the average percentage change in market

power associated with political connections and equals the weighted sum of both demand and supply effects,

$$\beta = (\sigma - 1)a + (1 - \tilde{e})\, b + \tilde{e}\tilde{b}, \tag{9}$$

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.

In order to separately identify the different components of β, we proceed in two steps. First, we 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. Specifically, taking logs in (2) and substituting the expression for A_{jt}, we obtain

$$y_{jt} = a_j + a_{rt} + a_{st} + a \cdot POL_{jt} + \sum_k \mu^k x^k_{jt} + \upsilon_{jt} \tag{10}$$

where x^k_{jt} 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 now the coefficient of POL_{jt} in (10) 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 (8) and (10), while demand effects would show up in (8) but not in (10).

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 the 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 (9), 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 9). The opposite would occur if demand effects are driven instead by the preferences of private consumers. Therefore, we will estimate equation (8) separately for firms operating in industrial sectors and/or geographic regions characterized by a different weight of public demand.

2.4 The misallocation of public expenditure

The effect of political connections on public sector efficiency depends crucially on the channels through which they impact on firm revenues. If political connections mainly help firms to overcome burdensome bureaucratic barriers, they would improve the efficiency of the public sector by raising the productivity of input providers. If, on the other hand, they merely distort public demand in favor of connected firms, this would negatively impact on aggregate welfare.

These two effects are intimately related with the different components of the coefficient

β in equation (9). This can be seen by computing the equilibrium provision of public good G. 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 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 $\Delta \ln G = \ln G - \ln G_0$, with G_0 denoting the provision absent any supply and/or demand shocks (i.e. $A = \tilde{B} = 1$), and Σ depends on the variance of firm-specific shocks.[3]

Part of the difference between G and G_0 depends directly on the first and second moments of the distribution of political connections 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 (costs) of greater dispersion in productivity (public demand) are increasing (decreasing) in 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.

The necessary conditions for greasing and grabbing effects to be different from zero are that a and $\tilde{b}$ are also different from 0, respectively. Empirically estimating such coefficients is exactly the purpose of the next sections.

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

[3] Formally, $G_0 = \left(\frac{\sigma-1}{\sigma}\right) \frac{J^{1/(\sigma-1)}}{\omega} \tilde{E}$ and $\Sigma = \left(\frac{\sigma-1}{2}\right) V(\upsilon) - \frac{1}{2\sigma} V(\tilde{\nu})$. The expression in equation (11) is computed assuming that the firm, sector-year and region-year components in A and $\tilde{B}$ are all equal to 0.

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.[4]

Firm-level data were further merged with a draw from Social Security archives containing individual-level information on any worker employed by an INVIND firm for at least one week over the period 1981-1997. In particular, the data contain workers' fiscal identifier which will be used to identify firms connected to a local administration. The final matched employer-employee dataset includes nearly 1.4 millions of individuals employed in 1227 firms. Table A1 in the Appendix presents the characteristics of our sample.

3.2 Political connections

The Italian system of local governments comprises 8100 municipalities, 103 provinces (95 until 1995) and 20 regions. Each of them is formed by a legislative council and an executive cabinet. They are renewed through elections regularly held every five years; of course, earlier elections may be called if the executive resigns the mandate before its term expires.

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: 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.

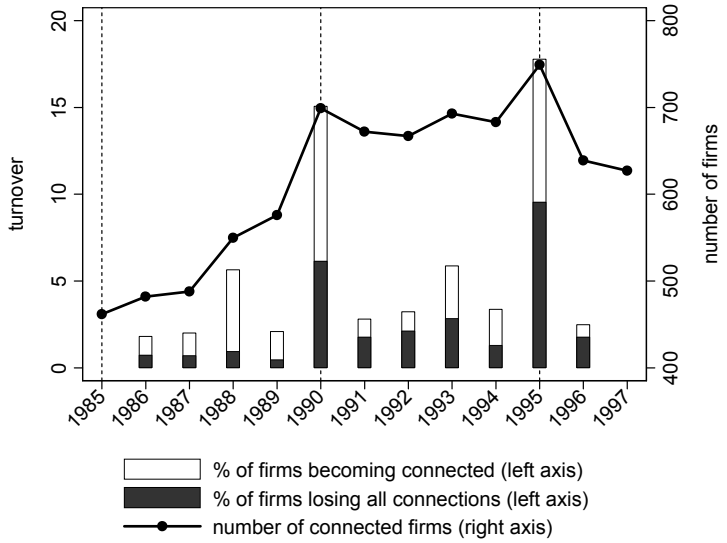
Our main measure of political connections is a binary variable indicating whether each firm has (at least) one employee appointed in a local government. Since the RLP also reports the party affiliation, we are able to further distinguish between politicians appointed with parties entering the executive cabinet, i.e. parties that won the elections, as opposed to minority parties. More specifically, we define $POLCON_{jt} = 1$ if firm j is employing at least one individual appointed during year t, and $POLWIN_{jt} = 1$ if the firm is employing at least one individual elected in a party entering the executive. This distinction is useful to explore the differential effect of accessing actual administrative power (as opposed to just be appointed in the local council).

Since our identification strategy is mostly based on within-firm changes in connec-

[4]The Company Accounts Data Service (Centrale dei Bilanci) collects detailed balance-sheet information on 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.

tion status, it is important that the indicators display enough variation along the time dimension. This seems indeed to be the case in our sample. About 40% of firms switch connection status at least once. These are the median firms (in terms of size) in our sample, as bigger (smaller) firms are always (never) connected through one of their employees; see table A1. Over time, the average turnover rate is close to 6% per year, peaking during the electoral years (1990 and 1995); see Figure 2. 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.

Figure 2: politically connected firms



Note: This graph shows the turnover of connection status (decomposed by entry and exit flows) and the total number of connections for the firms in our sample. The dotted vertical lines indicate the electoral years.

4 Empirical results

Our empirical results are organized as follows. We first estimate equation (8) to detect whether within-firm changes in connection status induce variation in (the log of) revenues. Focusing on the role of connections in the production function framework (10) 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 Baseline estimates

Table 1 presents the results of baseline estimates on equation (8). The dependent variable is firm revenues deflated using 2-digit industry indexes from the National Accounts.

In columns (1) to (3) we start by investigating the correlation between political connections and market power across firms. The data were cross-sectionalized taking within-firm averages of both dependent and explanatory variables. Hence, in these specifications $POLCON$ ($POLWIN$) equals the fraction of sample period in which a firm was connected to a politician (to a politician elected with a party that won the elections). To reduce the scope for omitted variable bias, we control non-parametrically (i.e. by including category-specific fixed effects) for differences in industrial sectors, provinces and firm size (as measured by total employment).

Table 1: baseline

	(1)	(2)	(3)	(4)	(5)	(6)
	CROSS SECTION ESTIMATES			FIXED EFFECTS ESTIMATES		
$POLCON$	.376***		.073	.031**		-.013
	(.081)		(.166)	(.013)		(.020)
$POLWIN$		.413***	.349**		.047***	.056***
		(.080)	(.166)		(.013)	(.021)
obs.	1227	1227	1227	12547	12547	12547
firms	1227	1227	1227	1227	1227	1227
firm FE	NO	NO	NO	YES	YES	YES
R^2	.597	.598	.598	.934	.934	.934
adj R^2	.552	.554	.554	.918	.918	.918

Note: The dependent variable is revenues at the firm level deflated with industry-level indexes from the Italian National Accounts. The sample is a panel of manufacturing firms observed during the period 1985-97. Columns (1) to (3) present cross sectional estimates on within-firm average variables, while columns (4) to (6) present (fixed effects) panel estimates on yearly observations. $POLCON$ is an indicator variable for at least one employee of firm j being appointed in a local government during year t. $POLWIN$ is an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t. Regressions in columns (1) to (3) include group size, province and sector fixed effects, while regressions in columns (4) to (6) include firm, province-year and industry-year fixed effects. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

According to these estimates, connected firms are characterized by significantly higher (average) revenues relative to non-connected firms. However, there are striking differences between different types of political connections. In particular, only connections with politicians that won the elections seem to matter. Quantitatively, the estimated coefficient in column (2) implies that a one standard deviation increase in the (average) fraction of time a firm is connected to a winning politician (0.42) raises its market share by 17% on average. Put differently, a one-year increase in the length of a connection would raise revenues over the whole period by 3.2%. Such large effects are likely to reflect, to a great extent, within-category spurious correlation between the likelihood of employing a politician and other (possibly unobserved) firm characteristics.

For this reason, all other specifications add firm, province-year and sector-year fixed effects. Identification of the effect of political connection thus exploits within-firm changes in revenues and connection status conditional on aggregate (demand or productivity) province- and sector-specific transitory shocks. Once we do that, the coefficient of $POLWIN$

drops by an order of magnitude to about 5% (as an average between the estimates in columns 5 and 6), while that of $POLCON$ remains not significantly different from zero (column 6). According to these estimates the only connections that matter are those established directly with the local executive power. Throughout the rest of the analysis, then, we will focus on $POLWIN$ as our main measure of political connections. We also tried alternative indicators, accounting for (i) the number of appointed individuals employed in the firm, and (ii) the size of the local administrations each firm is connected to. Results are qualitatively unaffected. We then stick to binary indexes for the sake of comparability with the previous literature on political connections.

4.2 Robustness

In Table 2 we investigate the robustness of these findings with respect to alternative potential sources of bias. One first concern is that there might be unaccounted (possibly unobserved) factors affecting both the probability of being connected and within-firm changes in output. In particular, fast-growing firms could be hiring workers more intensively than other firms, thus raising the chances of employing a local politician at the same time as market power expands, which would bias the estimated coefficient upwards. For this reason, in column 1 we allow for firm-specific trends (in addition to firm-specific fixed effects), which do not affect the results. Rather than following a linear trend, however, production levels could respond to transitory firm-specific shocks. A more severe test consists then in restricting the attention to those connections established and lost through tenured employees, i.e. those who determined a change in connection status at year t and were employed in the same firm also in previous (at least since $t-1$) and subsequent (at least until $t+1$) years. In other words, we excluded those cases in which the variable $POLWIN_{jt}$ changes *only* as a consequence of firm j hiring (or firing) decisions at time t. This alternative definition does not affect the results either (column 2). Pushing this argument further, we 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 3).

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, which is indeed a recurrent assumption in the 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 coefficient of $POLWIN$ 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

Table 2: robustness

	(1) *firm spec. trend*	(2) *tenured wks. only*	(3) *no wks. flows*	(4) *exclude wks. ability*	(5) *exports*	(6) *domestic*
$POLWIN$	.045***	.049***	.056***	.062***	-.0002	.044***
	(.012)	(.014)	(.017)	(.018)	(.107)	(.016)
$POLPRE$				.020		
				(.020)		
$POLPOST$				.035**		
				(.017)		
obs.	12547	10734	10734	10734	12547	12512
firms	1227	1220	1220	1220	1227	1227
R^2	.964	.938	.938	.938	.624	.898
adj R^2	.955	.922	.922	.922	.534	.873

Note: The dependent variable is revenues at the firm level deflated with industry-level indexes from the Italian National Accounts. Cols. (5) and (6) distinguish between exports and domestic sales, respectively. The sample is a panel of manufacturing firms observed during the period 1985-97, with the exception of columns (2) to (4), in which it is restricted to the 1986-96 period. $POLWIN$ is an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t. In column (2) $POLWIN$ is computed excluding workers entering/exiting the firm at year t, i.e. focussing on those being hired and/or leaving the firm in year $s \neq t$. In column (3), $POLWIN$ is computed further restricting to the sample of workers already employed by the firm in the first observational year (in most cases, 1985). $POLPRE$ is an indicator variable for at least one employee of firm j being subsequently appointed in a local government with the winning coalition, i.e. being appointed in year $s > t$. $POLPOST$ is an indicator variable for at least one employee of firm j being previously appointed in a local government with the winning coalition, i.e. being appointed in year $s < t$. All regressions include firm, province-year and industry-year fixed effects, except in column (1) where we included firm-specific trends. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

within-firm correlation between output and connection status net of the fixed-effect traceable to specific politician-employees. We allowed for separate dummies, $POLPRE$ and $POLPOST$, equal to 1 before and after appointment, respectively, because the individual effect might be different before and after the appointment, for instance because of experience accumulated or networks established while in office (Diermeier et al., 2005; Kramarz and Thesmar, 2006). While the estimate in column (4) is consistent with the existence of positive returns also after appointment, the estimated effect while in office is only slightly affected (if anything, it increases to 6.2%).

Finally, in the last two columns of the table 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.[5] This last finding is consistent with the grabbing hand hypothesis,

[5]Since exports are censored at zero in about 45% of the observations, the dependent variable in column (5) 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

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 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.

4.3 Productivity analysis

To what extent is the observed increase in market power attributable to productivity changes? This important issue has received so far little attention in the literature. 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 $POLWIN$ 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 (8) 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.

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 719 firms. Column (3) reports estimates of equation (10) 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

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).

Table 3: production function estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	RESTRICTED COEFFICIENTS				SECTOR-SPECIFIC COEFFICIENTS				NO FACTORS	
	r	va	Δy	Δp	r	va	Δy	Δp	Δy	Δp
$POLWIN$	.001	.015			.003	.013				
	(.004)	(.013)			(.004)	(.013)				
$\Delta POLWIN$			.004	.0008			.004	.0007	.028**	.002
			(.007)	(.004)			(.007)	(.004)	(.013)	(.004)
	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
obs.	10169	10109	4074	4076	10169	10109	4074	4076	4074	4076
firms	979	979	718	719	979	979	718	719	718	719
R^2	.995	.956	.81	.34	.995	.956	.815	.344	.26	.324
adj R^2	.993	.944	.765	.185	.994	.944	.771	.187	.088	.166

Note: 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 sample is a panel of manufacturing firms observed during the period 1985-97. $POLWIN$ is an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t. $\Delta POLWIN$ denotes the log-difference of the same variable between year t and $t-1$. 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; finally, $\Delta \ln L$, $\Delta \ln K$ and $\Delta \ln X$ are the log-difference of the same variables between year t and $t-1$. The coefficients of all control variables are restricted to be equal in columns (1) to (4); they are sector-specific in columns (5) to (8). All regressions include firm (except in columns 3, 4 and 7 to 10), province-year and industry-year fixed effects. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

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 the production factors to vary across sectors (columns 5 to 8).

One main concern with the last exercise is that the difference between the effect on revenues and output (Tables 1 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 1. 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 1). Finally, column (10) excludes that confounding price effects play any significant role. These findings suggest that sample selection 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.

4.4 The social costs of political connections

Combining our previous results suggests that firms experiencing connection-induced increases in revenues respond to demand shifts rather than to productivity pushes. To distinguish public from private demand shifts, we will 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 firm balance sheets report this information. We circumvent 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 Tables 4 and 5.

Table 4: the role of public demand

	(1)	(2)	(3)	(4)	(5)	(6)
	SECTORAL DEP.		REGIONAL DEP.		CORRUPTION	
	high	*low*	*high*	*low*	*high*	*low*
$POLWIN$	.071***	.006	.161**	.032***	.076**	.022
	(.020)	(.017)	(.063)	(.012)	(.031)	(.016)
obs.	6915	5624	1769	10769	5450	7118
R^2	.952	.933	.939	.936	.887	.934
adj R^2	.936	.907	.902	.922	.857	.901

Note: The dependent variable is revenues at the firm level deflated with industry-level indexes from the Italian National Accounts. The sample is a panel of manufacturing firms observed during the period 1985-97. Columns (1) and (2) consider only the subsample of firms operating in manufacturing sectors above and below the median in terms of sales to the public administration over total sales, respectively. Columns (3) and (4) consider only the subsample of firms operating in regions above and below the median in terms of public expenditure over total value added in the manufacturing sector. Columns (5) and (6) consider only the subsample of firms operating in provinces above and below the median in terms of corruption, respectively. $POLWIN$ is an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t. All regressions include firm, province-year and industry-year fixed effects. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

The extent of firms' reliance on demand by the public sector largely depends on their specific line-of-work. To attribute each firm in the sample a degree of "proximity" to public demand we exploited the Italian input-output matrix and ranked manufacturing industries based on the ratio of sales to the public sector over total sales. We then estimated the effect of political connections separately for firms operating in industries 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%; Table A2 in the Appendix reports the list of sectors that are most and least dependent from the public administration.[6] The estimates presented in

[6]The measure of industry dependence on public demand was computed from the 2-digit IO matrix issued by the Italian National Statistical Institute (Istat) in 1992. Specifically, manufacturing industries were ranked based on the fraction of demand of their products ("use") from the PA, Education, Health and Waste sectors. According to this classification, industries with high shares of sales to the public sector

columns 1 and 2 of Table 4 show that the effect is significant (at the 1% level) only for firms operating in industries that rely relatively more on demand by the public administration. At the opposite, the revenues of firms that sell their products almost exclusively to private consumers are not affected by political connections.

Taken together with the productivity analysis above, this finding suggests 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 (9), $\beta = 0$ whenever $\tilde{e} = 0$, which in turn implies that $a = b = 0$, or

$$\beta = \tilde{e}\tilde{b}. \tag{12}$$

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 8%, respectively.[7] While the effect of political connections is greater than zero in both groups of regions (columns 3 and 4, respectively), its magnitude is five times larger in high-expenditure than in low-expenditure regions.[8]

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 (12) as the ratio of the estimated β (equal to 5% 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 $POLWIN$ (0.247), 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

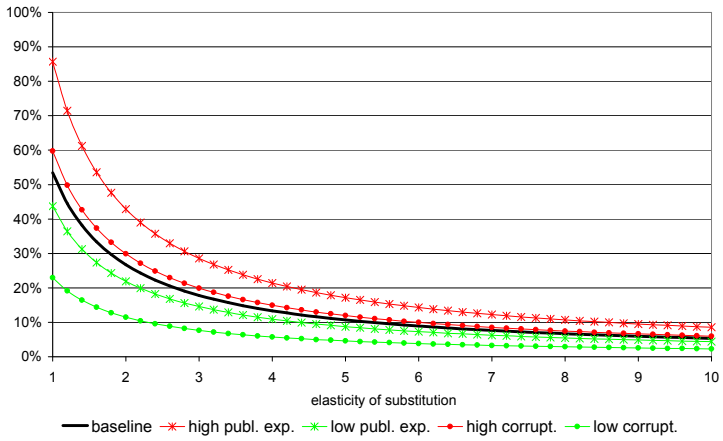
include for example basic pharmaceutical products and pharmaceutical preparations, medical and precision instruments, and manufacture of farm products. Among low-dependence industries are textiles, footwear and the manufacture of agricultural products.

[7] 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, see 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).

[8] 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. It does adequately capture relative differences in the reliance on public demand across geographical areas, though, 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).

the very concept of misallocation loses significance) to slightly more than 50% 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 equal to 18% (relative to the case without political connections and for any given level of public expenditure).

Figure 3: The misallocation of public expenditure



Note: This graph shows the estimated degree of misallocation of public expenditure due to political connections, as measured by the variation in public good provision 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. High and low corruption areas include provinces above and below the median in terms of parliamentary malfeasance, as measured by Golden (2007).

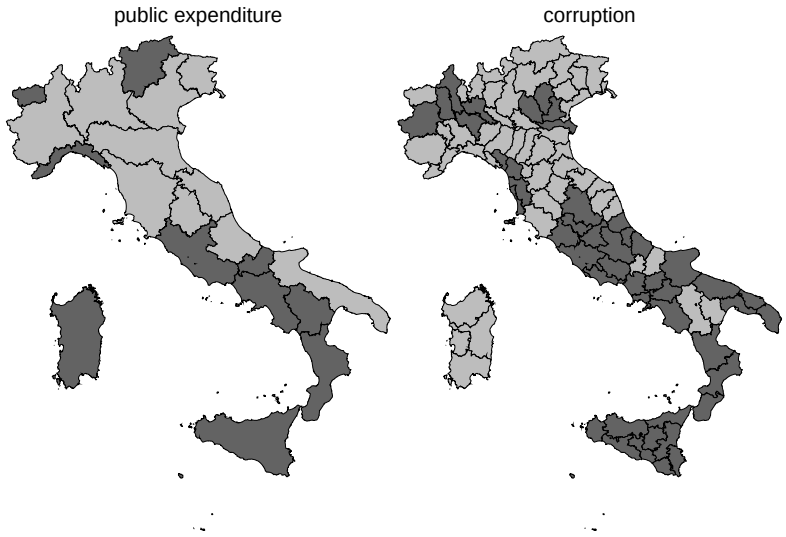
The same graph also plots the (estimated) degrees of misallocation in regions characterized by high and low public expenditure, which turn out to be greater and lower than in the baseline case, respectively. This is because the estimated revenue premium (β) in high versus low expenditure regions varies more than the incidence of public expenditure in manufacturing ($\tilde{e}$) implying a larger value of $\tilde{b}$ in the former group of regions. This finding may be interpreted as a 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 the last two columns of Table 4 we separately estimate the effect of connections in provinces that lie above and below the median in terms of corruption, as measured by the incidence of political malfeasance during the period 1948-93. This measures 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.[9] As can be

[9]In order to investigate a legislator for suspected criminal wrongdoing, the Italian constitution required

seen from the map in Figure 4, this approach produces a significant overlap with variation in public expenditure, both measures broadly yielding the north-south divide with some relevant exceptions. Results in columns 5 and 6 show that the returns to connections are significant only for firms located in high corruption areas. The implied distance in the degree of misallocation between high and low corruption regions is analogous to that estimated in regions characterized by high and low public expenditure, although with a slightly lower absolute level (see Figure 3).[10]

Figure 4: Regional characteristics



Note: These figures show the distribution of public expenditure across Italian regions and of corruption across provinces. Darker colors denote regions and provinces above the median in terms of each variable.

Combining the sectoral and the geographical dimensions confirms that the average estimated effect of connections on market shares 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 Table 5, where we reported the results obtained running our revenues regression on separate subsamples corresponding to the intersection of the sectoral and (each of the two) geographical breakdowns. The estimated coefficient is never statistically significant for firms operating in sectors with limited (technological) interaction with the public administration (second row). On the other hand, it is always significant and higher in magnitude (up to five times larger

(until 1993) a majority vote by the floor of the relevant chamber to remove immunity. Most of the times such requests were not granted.

[10]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 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)

than the average effect) for highly dependent firms located in high expenditure and high corruption areas (first row).

Table 5: the role of public demand (sectors × regions)

SECTORAL DEP.	REGIONAL DEP.		CORRUPTION	
	high	*low*	*high*	*low*
high	.248***	.051***	.111***	.026
	(.070)	(.017)	(.031)	(.029)
low	.028	-.001	-.023	.002
	(.068)	(.023)	(.041)	(.025)

Note: The dependent variable is yearly revenues at the firm level, deflated with industry-level indexes from the Italian National Accounts. The sample is a panel of manufacturing firms observed during the period 1985-97. This table reports the coefficients and standard errors of $POLWIN$, an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t, estimated on different subsamples. The upper and lower row restrict the sample to firms operating in manufacturing sectors above and below the median in terms of sales to the public administration over total sales, respectively. Columns (1) and (2) restrict the sample to firms operating in regions above and below the median in terms of public expenditure over total value added in the manufacturing sector. Columns (3) and (4) restrict the sample to firms operating in provinces above and below the median in terms of corruption, respectively. All regressions include firm, province-year and industry-year fixed effects. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

4.5 The private returns to political connections

Finally, we quantify the private returns to political connections in terms of additional profits earned by firm owners. In Table 6 we thus replicate our baseline revenues regression (i.e. the specification of column 5 in Table 1) 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 5% increase in EBITDA in correspondance of the connection period, nearly the same increase experienced by 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 900 thousands euros with respect to the baseline scenario. For comparison, the distance between profits of firms at the 50th and firms at the 75th percentile in our sample is slightly less than 1600 thousands euros.[11] In column (3) we look at what these results imply for

[11]Similar results, not reported here for brevity, are obtained using operating profits (Earnings Before Interests and Taxes, EBIT).

profitability, as measured by the Return on Asset (ROA). According to our estimates, the latter increases by more than 0.7 percentage point in connected firms (the 50th and the 75th percentile difference amounting to about 4 percentage points). 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, the effect on taxes being not significantly different from zero. This is consistent with the fact that taxes in Italy are largely beyond the control of local politicians.

Table 6: profits

	(1)	(2)	(3)	(4)	(5)
	$\ln \Pi$	*EBT*	*ROA*	*tax (income)*	*tax (total)*
POLWIN	.049**	907.6**	.703***	-.037	-.055
	(.023)	(353.9)	(.221)	(.036)	(.039)
obs.	11692	12551	12551	12530	12530
firms	1218	1227	1227	1226	1226
R^2	.866	.341	.623	.227	.228
adj R^2	.832	.183	.533	.041	.043

Note: The dependent variables is reported on top of each column. $\ln \Pi$ is the log of Earnings Before Interests Taxes Depreciation and Amortization (EBITDA); *EBT* is Earnings Before Taxes; *ROA* is Return on Assets; *tax (income)* is the rate of income taxes over *EBT*; *tax (total)* is the rate of total taxes (income and property) over *EBT*. The sample is a panel of manufacturing firms observed during the period 1985-97. *POLWIN* is an indicator variable for at least one employee of firm j being appointed in a local government with the winning coalition during year t. All regressions include firm, province-year and industry-year fixed effects. Robust standard errors in parenthesis. *, ** and *** denote coefficients significantly different from zero at the 90% confidence, 95% confidence and 99% confidence, respectively.

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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Appendix

Table A1: summary statistics

	SUMMARY STATISTICS			STANDARD DEVIATION			DISTRIBUTION		
	obs.	firms	mean	overall	between	within	10^{th} pc.	50^{th} pc.	90^{th} pc.
				all firms					
Total revenues, ths. €	12,547	1,227	90,273	486,623	442,100	91,451	5,802	23,942	169,000
Value added, ths.€	12,547	1,227	24,610	110,894	101,527	28,200	1,939	7,256	46,931
Exports, ths.€	12,547	1,227	22,303	161,926	141,355	53,947	0	934	36,152
Domestic sales, ths.€	12,547	1,227	67,970	340,040	309,113	74,875	4,026	17,986	130,000
r	12,547	1,227	10.232	1.342	1.308	0.407	8.666	10.083	12.037
va	12,459	1,226	9.046	1.268	1.235	0.381	7.593	8.900	10.761
ln(1+Exports)	12,547	1,227	5.022	4.686	3.513	3.233	0.000	6.841	10.496
ln(Domestic)	12,512	1,227	9.912	1.413	1.341	0.500	8.316	9.801	11.775
Δy	5,075	1,070	-0.002	0.262	0.179	0.226	-0.206	0.001	0.202
Δp	5,191	1,082	0.032	0.068	0.047	0.058	-0.030	0.035	0.090
Workers	12,547	1,227	895	2,473	2,373	386	113	355	1,708
Capital, ths.€	10,278	987	49,703	299,469	278,228	39,499	2,170	11,368	85,994
Intermediate inputs, ths.€	12,547	1,227	65,920	382,704	343,804	82,642	3,470	16,277	120,000
EBITDA, ths.€	12,547	1,227	8,039	39,788	28,129	27,390	216	2,129	17,024
ROA, %	12,547	1,227	9.435	10.546	8.431	7.443	0.052	8.297	21.453
EBT, ths.€	12,547	1,227	2,630	31,602	19,395	26,465	-1,066	408	8,337
Total wages, ths.€	12,547	1,227	15,673	46,126	45,062	6,688	1,519	5,124	32,270
$POLWIN$	12,547	1,227	0.552	0.497	0.419	0.279	0	1	1
$POLCON$	12,547	1,227	0.617	0.486	0.416	0.265	0	1	1
				firms that are always connected					
Total revenues, ths. €	5,041	513	183,287	756,723	672,939	143,479	11,384	58,561	374,841
Value added, ths.€	5,041	513	49,662	171,456	153,609	44,230	3,662	17,836	95,509
Exports, ths.€	5,041	513	47,304	252,907	216,054	84,629	0	5,569	94,281
Workers	5,041	513	1,741	3,725	3,508	605	210	815	3,289
				firms that are connected in some years					
Total revenues, ths. €	4,766	426	31,966	42,624	42,605	14,075	5,882	19,257	70,751
Value added, ths.€	4,766	426	8,997	11,227	10,589	4,612	1,994	5,748	18,760
Exports, ths.€	4,766	426	6,219	14,111	13,329	8,020	0	300	17,000
Workers	4,766	426	397	362	348	59	116	301	781
				firms that are never connected					
Total revenues, ths. €	2,740	288	20,570	33,534	39,017	9,138	3,956	10,549	43,641
Value added, ths.€	2,740	288	5,676	8,866	10,158	2,398	1,382	3,219	10,918
Exports, ths.€	2,740	288	4,285	11,554	11,297	6,291	0	0	11,756
Workers	2,740	288	206	178	180	28	84	159	381

Note: This table reports the main characteristics of the firms in our sample and of the sub-groups 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 A2: Dependence on Public Demand

	SECTORS	DEPENDENCE
	most dependent sectors	
25	Pharmaceutical products	39.92%
49	Building and repairing of ships and boats	11.75%
51	Manufacture of planes, aircrafts and spacecrafts	9.48%
20	Pulp, paper and paper product	4.63%
21	Publishing and printing	4.61%
24	Chemicals and chemical products	4.49%
54	Other manufacturing industries	4.22%
22	Manufactures of coke and petroleum products	3.72%
27	Rubber products	3.15%
43	Manufacture of communication equipment	3.00%
45	Manufacture of medical and precision instruments	2.78%
55	Recycling	2.25%
	least dependent sectors	
13	Tobacco and beverages	0.20%
12	Manufacture of prepared animal feeds	0.20%
18	Manufacture of footwear	0.13%
14	Fabric and Textiles	0.13%
46	Optical equipment	0.07%
50	Manufacture of railway and tramway locomotives and rolling stock	0.02%
39	Manufacture of computers and other information processing equipment	0.01%
38	Manufacture of domestic appliances n.e.c.	0.00%
40	Manufacture of electrical equipment for engine and other	0.00%
42	Manufacture of electronic components	0.00%
44	Manufacture of television and radio receivers, sound or video recording	0.00%
53	Manufacture of watches and clocks	0.00%

Note: This table reports the sectors characterized by the highest and lowest incidence of sales to the public administration over total sales. The measure of industry dependence on public demand was computed from the 2-digit IO matrix issued by the Italian National Statistical Institute (Istat) in 1992. Specifically, manufacturing industries were ranked based on the fraction of demand of their products ("use") from the PA, Education, Health and Waste sectors. The sectoral classification follows the 2-digit ATECO 1991, which is the Italian adaptation of the NACE Rev. 1.

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