

## CONNECTING TO POWER: POLITICAL CONNECTIONS, INNOVATION, AND FIRM DYNAMICS

UFUK AKCIGIT

Department of Economics, University of Chicago, NBER, and CEPR

SALOMÉ BASLANDZE

Federal Reserve Bank of Atlanta and CEPR

FRANCESCA LOTTI

Bank of Italy

How do political connections affect firm dynamics, innovation, and creative destruction? We extend a Schumpeterian growth model with political connections that help firms ease bureaucratic and regulatory burden. The model highlights how political connections influence an economy's business dynamism and innovation, and generates a number of implications guiding our empirical analysis. We construct a new large-scale data set for the period 1993–2014, on the universe of firms, workers, and politicians, complemented with corporate financial statements, patent data, and election data, so as to define connected firms as those employing local politicians. We identify a leadership paradox: market leaders are much more likely to be politically connected, but much less likely to innovate. Political connections relate to a higher rate of survival, as well as growth in employment and revenues, but not in productivity—a result that we also confirm using the regression discontinuity design. At the aggregate level, gains from political connections do not offset losses stemming from lower reallocation and growth.

**KEYWORDS:** Firm dynamics, innovation, political connections, creative destruction, productivity, bureaucracy, regulation.

### 1. INTRODUCTION

A GROWING BODY of empirical literature argues that factor reallocation from less-productive to more-productive firms is an important source of productivity growth (e.g., Bartelsman and Doms (2000), Foster, Haltiwanger, and Krizan (2001, 2006)). Likewise, innovation-based endogenous growth models (e.g., Grossman and Helpman (1991), Aghion and Howitt (1992)) assert that creative destruction is the key driver of economic growth. Creative destruction describes the replacement of stale incumbent firms by innovative entrants. These models assume that entrepreneurs only need to innovate the most superior product or technology to seamlessly replace an incumbent firm and thus become the new market leader. This conjecture clearly does not bear out in the real world, however, as incumbent firms use a range of strategies to deter innovative competitors and maintain market position. One of such strategies can be the use of political connections

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Ufuk Akcigit: [uakcigit@uchicago.edu](mailto:uakcigit@uchicago.edu)

Salomé Baslandze: [baslandze.salome@gmail.com](mailto:baslandze.salome@gmail.com)

Francesca Lotti: [francesca.lotti@bancaditalia.it](mailto:francesca.lotti@bancaditalia.it)

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that help some firms dominate a market without needing to compete in terms of innovation.

This paper studies firm-level political connections and their implications for firm dynamics, innovation, and aggregate productivity, combining theoretical insights with empirical analysis of a new large-scale micro-level data set on firms and politicians in Italy.

Our analysis begins with a theoretical investigation of how political connections could influence an economy's business dynamism, new firm creation, and innovation. To organize our thoughts, we extend a basic Schumpeterian creative destruction model by introducing political connections. The model features creative destruction by entrants à la Aghion and Howitt (1992). Firms face bureaucratic and regulatory burden that, as in Restuccia and Rogerson (2008), Hsieh and Klenow (2009), Garicano, Lelarge, and Van Reenen (2016), is modeled as a wedge in the firm's production process.<sup>1</sup> These bureaucratic and regulatory frictions may be alleviated by connecting with politicians at some cost.

The model provides new theoretical insights into understanding the social costs of political connections. Statically, political connections may be beneficial by smoothing out bureaucratic frictions. However, in the dynamic environment, the incumbents' political influence gives them advantage over other market participants, leading to reduced creative destruction and innovation on the whole.

The model provides a set of empirical implications that distinguish this model from an alternative model where firms use political connections to further innovative activities. The static problem implies a threshold rule of firm size above which firms find it profitable to incur the cost of connections to lower the burden of regulations. Hence, the first important prediction of our model is that market leaders are more likely to rely on political connections in the competition for market share, while newcomers are more likely to innovate. We also discover that firms that become connected and remove wedges enjoy temporarily higher employment and sales growth but have lower labor productivity growth. From a dynamic perspective, the model implies that markets with politically connected incumbents see new firms enter at a reduced rate. Intuitively, new firms not only need to compete with incumbents on productivity, but they also need to overcome the regulatory or bureaucratic burden against which the connected incumbent is already immune. The model then implies that market leaders anticipate this dynamic effect and strategically invest in political connections to prolong their lead. We obtain a tractable expression for the gap in connection decisions in the static and dynamic environments. We see that two forces—the existence of bureaucratic frictions and the asymmetric access to the political network—give rise to strategic use of political connections by incumbents. As a result, markets with politically connected incumbents are dominated by older and larger firms that innovate very little and grow slowly.

The second part of the paper evaluates the implications of the model using a large-scale confidential micro-level data set from Italy. The data span the years 1993–2014, merging: (i) Social Security data on the universe of private-sector workers and firms; (ii) firms' financial statements; (iii) patent data from the European Patent Office; (iv) the national registry of local politicians; and (v) detailed data on local elections in Italy.

We define a firm as being politically connected in a particular year if the firm employs at least one local politician serving at the municipal, provincial, or regional level in that year. We also rate the political power of each connection using the position and party affiliation

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<sup>1</sup>For an extensive evidence on high regulatory and bureaucratic burden and political connections in Italy, see Section 4.2.

of a politician-employee. We find that firm-level political connections are widespread in Italy, especially among large and old firms. The average share of connected firms by industries is 4.5%, and connected firms account for one-third of employment across all industries.

While most of the empirical literature looks at high-profile political connections, links with local politicians are much more pervasive and can have broader consequences for the overall economy. After a series of reforms and a change of the Constitution, local politicians in Italy were gradually granted greater decision-making power during the time period we consider. In fact, they are responsible for the majority of the administrative and bureaucratic burden faced by firms and play a crucial role in determining how national regulations are implemented and enforced. Local governments have authority over, and responsibility for, the provision of local public goods and services, administrative authority over the issuing of permits and licenses, and power to set rates for certain categories of taxes ([Alesina and Paradisi \(2017\)](#)). Hence, focusing on local politicians is not only convenient because these connections are observable; local politicians are also in the best position to help firms.

Empirical patterns in these data match the implications of our model, confirming that the use of political connections has had detrimental effects for innovation and productivity growth in Italy's economy. First, we begin by relating firms' uses of innovation and political connections as a function of their market leadership. We document a "leadership paradox" that clearly illustrates the political economy problem of creative destruction, finding that the following holds:

**FACT 1: *Market leaders are the most politically connected but the least innovative, relative to their direct competitors.***

This fact is consistent with the view that market followers are incentivized to innovate in order to leapfrog the leader with new products or technologies. Political connections act as an entry barrier, however. Rather than competing on innovation, market leaders can instead rely on defensive strategies to maintain their market position. Since entrants might have lower access to political influence, this "leadership paradox" leads to inefficiency in the market.

Second, we consider firm-level outcomes from political connections. Using cross-firm and within-firm variation in political connections, we document the following:

**FACT 2: *At the firm level, political connections are associated with higher employment and revenue growth but not with productivity growth.***

**FACT 3: *Politically connected firms are more likely to survive, and their survival probability increases along with the political power of the politicians they employ.***

Fact 2 helps distinguish between two alternative hypotheses, namely, that connections are either beneficial, or detrimental, to technological progress. Our model suggests that if firms use their connections to push the technological frontier, employment growth should be coupled with productivity growth. However, if political connections are used to gain preferential treatment or to directly eliminate competition by limiting market access, growth in employment would be decoupled from growth in productivity, like our data show.

We exploit a quasi-random discontinuity caused by local elections decided on a thin margin to gauge causality in our growth regressions (Lee (2008), Akey (2015)). We collect data on all local elections in Italy and, based on vote allocation, identify the elections that were decided on a thin margin. Our regression discontinuity design (RDD) compares firms that were connected right before a marginally contested election with a politician from winning versus losing parties. The results of closely contested elections can be considered to have been decided by pure chance, with random events like breaking news or a weather shock driving the outcome. Discontinuities in outcomes between winning and losing firms *after* the tightly contested election can therefore be attributed to political connections having a causal relationship with firm outcomes. We find that differences in post-election outcomes between winning and losing firms are large in marginal elections: firms with politicians on the winning side grow much more relative to losers in terms of size but not in productivity. This result is driven by the particularly bad performance of firms connected with losing politicians in very tightly contested elections.

Given the nature of our confidential Social Security data, we can also observe the labor income of politicians employed by each firm. This detail allows us to estimate the level of rent sharing (static surplus) between firms and their employee-politicians. As a result, we find the following:

**FACT 4:** *Politician-employees earn significant wage premiums relative to their co-workers. This premium implies an average 20%–80% rent sharing between the politicians and the firm, respectively.*

Taken together, these four empirical facts from micro-level data fit the predictions of the benchmark model. This strong tie between the facts and the model supports the main mechanism, where the primary role of political connections is to secure preferential treatment, rather than to support innovation.

Our last empirical facts relate to aggregate outcomes from political connections. Consistently with the model, data suggest that the effects of firm-level political connections go beyond the micro-level effects on connected firms, exerting a significant drag on the economy. We document the following:

**FACT 5:** *New firms enter more-connected industries at a slower rate, but conditional on entry, entrants are more likely to be connected than in other industries.*

**FACT 6:** *More-connected industries have a lower share of young firms and exhibit lower growth and productivity.*

We conclude our analysis by using our model and data together to quantify bureaucratic and regulatory frictions and to provide a back-of-the-envelope calculation of static benefits and dynamic costs of political connections. Bureaucratic and regulatory burden is pervasive and represents a common obstacle for businesses in Italy;<sup>2</sup> in fact, the country ranks among the worst in the friendliness of business regulations across developed countries,<sup>3</sup> and Gratton, Guiso, Michelacci, and Morelli (2021) provided extensive evidence

<sup>2</sup>According to the “Burden Measurement Program” report by the Ministry for Simplification and Public Administration of Italy, the estimated administrative burden faced by private firms in Italy is a staggering 31 billion Euros per year, representing 1.7% of the Italian GDP.

<sup>3</sup>Doing Business Indicator, The World Bank, 2017.

that Italy's bureaucratic efficiency collapsed since the 1990s. We measure industry-level bureaucratic and regulatory burden and combine it with regional data on institutional quality to provide evidence for the importance of bureaucratic and regulatory frictions for the use of political connections. We show that the use of political connections and a negative relationship between connections and business dynamism are particularly strong in heavily regulated industries and regions with poor institutional quality—low regulatory quality and control of corruption.

After parameterizing the model, we estimate that the bureaucratic and regulatory wedges cause an aggregate output loss of 4% relative to the economy without wedges. The presence of political connections that ease the regulatory burden for connected firms leads to a 1.2% static gain in aggregate output, so recovering 30% of output loss from wedges. However, the dynamic losses caused by political connections' effects on creative destruction and productivity growth outweigh the static benefits; they reduce the present value of aggregate output by 3%.

The findings in this paper illustrate that the use of political connections among market leaders is common, and this has dire consequences for aggregate dynamics due to lower reallocation. Political influence is one of the growth strategies of market leaders that results in persistent dominance of large firms, which makes the economy less innovative on the whole. Recent evidence on the increasing dominance of large firms, declining business dynamism in the United States and OECD, and an increase in lobbying (Zingales (2012), Decker, Haltiwanger, Jarmin, and Miranda (2016), Loecker and Eeckhout (2018)) suggests that the facts we document in the Italian context are not a peculiarity, but can be generalized to other settings.

The paper is organized as follows. The next section reviews the related literature. Section 3 provides a theoretical framework and lists the implications of the model. Section 4 overviews our data and variable construction. Section 5 presents the empirical analysis of the micro-level data. Section 6 then explores aggregate outcomes, weighs the importance of channels, and provides back-of-the-envelope calculations for static gains and dynamic losses from political connections. Section 7 concludes.

## 2. LITERATURE REVIEW

The paper speaks to several strands of the literature. First, it relates to the literature on creative destruction, reallocation, and growth. The process of creative destruction is at the center of endogenous growth models (Aghion and Howitt (1992), Grossman and Helpman (1991), Klette and Kortum (2004), Lentz and Mortensen (2008), Aghion, Akcigit, and Howitt (2014), Acemoglu, Akcigit, Alp, Bloom, and Kerr (2018), Akcigit and Kerr (2018), Jones and Kim (2018)),<sup>4</sup> and the importance of factor reallocation through creative destruction has been documented empirically (Bartelsman and Doms (2000), Foster, Haltiwanger, and Krizan (2001, 2006)). Less is known, however, about the factors that prevent such reallocation. Our theory shows that the existence of market frictions and the unequal distribution of political connections across firms leads to idiosyncratic distortions between incumbents and followers, hampering reallocation and growth. This way, insights from the literature on creative destruction bring new dynamic cost considerations to the largely static literature on wedges and misallocation (Restuccia and Rogerson (2008), Hsieh and Klenow (2009)).

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<sup>4</sup>Some prominent examples of endogenous growth models without creative destruction are Romer (1990), Jones (1995), Acemoglu (2002), Lucas and Moll (2014), and Perla and Tonetti (2014).

Second, our study contributes to the growing literature on market power and declining business dynamism (Decker et al. (2016), Loecker and Eeckhout (2018), Akcigit and Ates (2023), Aghion et al. (2019)). The evidence increasingly suggests that strategic actions by market leaders might be contributing to the observed decline in competitiveness and productivity growth. Andrews, Criscuolo, and Gal (2016) and Akcigit and Ates (2021) documented a widening productivity gap between market leaders and followers and attributed it to declining knowledge diffusion from frontier firms to laggards. Recent micro-level studies show how market leaders' use of strategic patenting or merger and acquisition deals has negative consequences for competitiveness (Cunningham, Ederer, and Ma (2021), Argente, Baslandze, Hanley, and Moreira (2020), Baslandze (2021)). In this paper we show that political influence is another strategy by which market leaders preserve the market, with negative effects for aggregate business dynamism. In this sense, our work is close to that of Krusell and Rios-Rull (1996), Mukoyama and Popov (2014), and Bellettini, Ceroni, and Prarolo (2014) who studied models with tensions between incumbents and entrants in environments where firms can influence entry policies,<sup>5</sup> while Comin and Hobijn (2009) showed that lobbying dampens new-technology adoption when there are close predecessors in the adopting country. Our paper highlights the importance of bureaucratic and regulatory frictions as mediating factors through which connections translate into poor aggregate performance. Gutiérrez and Philippon (2017) suggested that increasing market concentration in the United States can be explained by increasing regulations, while Zingales (2012) discussed recent growth in lobbying activity and argued that the American economy has become pro-large-business. Relatedly, Bessen (2016) showed that market regulations and rent-seeking are tightly linked in the U.S. and that increasing corporate profits can largely be attributed to political rent-seeking after the 2000s.

Third, our paper contributes to a large body of literature on the links between firms and politicians. We can roughly split this literature into two strands: one empirically documenting *private returns* from political influence, and the second emphasizing the aggregate *social implications* of political influence.

The first strand has documented large private returns from political influence in different settings (Fisman (2001), Johnson and Mitton (2003), Faccio and Parsley (2006), Akey (2015), Acemoglu, Hassan, and Tahoun (2017)). Connected firms perform better due to various favors received from politicians: credit access and financing (Johnson and Mitton (2003), Joh and Chiu (2004), Khwaja and Mian (2005), Cull and Xu (2005), Leuz and Oberholzer-Gee (2006)); access to government contracts, stimulus funds, and public subsidies (Goldman, Rocholl, and So (2013), Adelino and Dinc (2014), Fang, Lerner, Wu, and Zhang (2018), Schoenherr (2019), Choi, Penciakova, and Saffie (2021), Baltrunaite, Giorgantonio, Mocetti, and Orlando (2021)); relaxed regulatory oversight of the connected firm or stiffer regulatory oversight of rivals (Kroszner and Stratmann (1998)); lighter taxation (Arayavechkit, Saffie, and Shin (2018)); and government bailouts of financially distressed firms (Faccio, Masulis, and John (2006), Duchin and Sosyura (2012)).

The second strand of the literature is largely organized around two classic ideas about the social costs of political connections: the *greasing wheels* hypothesis (Kaufmann and Wei (1999)) and the *grabbing hand* hypothesis (Shleifer and Vishny (2002)).<sup>6</sup> According to

<sup>5</sup>Interestingly, the model in Bellettini, Ceroni, and Prarolo (2014) also incorporates voting and shows how the environment with Schumpeterian innovation and political connections endogenously leads to political persistence. The authors also documented a negative relationship between political persistence and growth in Bellettini, Berti Ceroni, and Prarolo (2013a,b).

<sup>6</sup>More recently, Arayavechkit, Saffie, and Shin (2018) and García-Santana, Moral-Benito, Pijoan-Mas, and Ramos (2020) explored another type of social cost coming from capital misallocation.

the former, connections are expected to have a positive effect on welfare if they increase efficiency by relieving the burden of regulation, that is, by greasing the wheels. According to the latter, connections have social costs when a firm uses political influence to divert public demand toward themselves.

These two hypotheses are evaluated in [Cingano and Pinotti \(2013\)](#) (CP, henceforth) whose empirical setting is related to ours. Like us, they identified firm-level connections with local politicians in Italy and showed that connected firms collect a revenue premium that comes from increased sales to the government, but not from higher productivity. CP, therefore, suggested that the *grabbing hand* hypothesis holds. Although some of the empirical details overlap, the present paper differs significantly from CP in terms of the theoretical and empirical focus on innovation, creative destruction, and the associated political economy of it, as well as the empirical scale of the analysis. In terms of data, CP used a sample of 1200 manufacturing firms with 50 or more employees,<sup>7</sup> while we rely on data covering the entire private sector of the Italian economy—4.5 million firms of all sizes in all sectors over the period 1985–2014. Next, we provide causal identification using RDD. In addition, given its universal coverage, our data allow us to focus on important metrics of firm dynamics that have received little attention in the literature so far—market entry and exit, innovation, aggregate productivity, and growth. The “leadership paradox” on the market leaders’ declining innovation but increasing political connections, in turn, has important implications for innovation policy.<sup>8</sup> More broadly, our theory draws different conclusions about the underlying mechanisms and social costs of political connections. In our large-scale data on the entire economy, we do not find support for the government-demand channel; instead, our results suggest that firms often use political connections to smooth bureaucratic and regulatory frictions. As a result, while CP was concerned about social cost from inefficient provision of public goods, we highlight a new type of dynamic social cost coming from lowered innovation and business dynamism.

### 3. THEORETICAL MODEL

We begin with a simple extension of the basic Schumpeterian growth model ([Aghion and Howitt \(1992\)](#)), introducing firm’s choice of political connection. In the model, political connections help firms overcome bureaucratic hurdles and regulatory burdens, which are represented as wedges in the production process, following [Restuccia and Rogerson \(2008\)](#), [Hsieh and Klenow \(2009\)](#), and [Garicano, Lelarge, and Van Reenen \(2016\)](#).

#### 3.1. *Static Environment*

A competitive final goods sector uses the following CES aggregation:<sup>9</sup>

$$Y = \frac{1}{1-\beta} \left[ \sum_{m=1}^M q_m^{\frac{\beta}{1-\beta}} y_m \right]^{1-\beta}, \quad (1)$$

<sup>7</sup>Those firms in the survey are representative of a population of fewer than 10 thousand firms (around 2% of the number of firms in manufacturing).

<sup>8</sup>For example, in light of this evidence, policies should acknowledge the opposing innovation and defensive incentives of the market leaders and followers.

<sup>9</sup>We summarize all the model variables in Appendix Table A.I of the Supplemental Material (Akcigit, Baslandze, and Lotti (2023)).

where  $y_m$  denotes the output of an intermediate goods producer of vintage  $m$ . Different vintages differ by their qualities  $q_m$  and are perfect substitutes after adjusting for quality. Among the *implemented*  $M$  vintages, the latest vintage  $M$  is of the highest quality. As it will become clear, in this model, some of the new vintages offered by potential entrepreneurs, even though they are of superior quality, might not get implemented in equilibrium. Production function (1) implies that the demand faced by vintage- $m$  producer is given by

$$p_m = q_m^{\frac{\beta}{1-\beta}} \left[ \sum_{m=1}^M q_m^{\frac{\beta}{1-\beta}} y_m \right]^{-\beta}. \quad (2)$$

Producers of different vintages compete on prices to capture the whole market. In equilibrium, the firm with the best cost-adjusted quality will win the market. Assumption 1 ensures that the producing firm will charge the monopoly price. Hence, we will study the monopolist's problem throughout this section.

**ASSUMPTION 1:** *Producers of different-quality vintages play a two-stage pricing game. In the first stage, producers choose to pay a fee  $\varepsilon$  (which we assume to be arbitrarily small, i.e.,  $\varepsilon \approx 0$ ) to enter a price competition in the second stage. In the second stage, all firms that already paid the fee bid prices.*

This assumption ensures that only the firm with the highest cost-adjusted quality pays the fee and goes on to the second stage, implying that the producing firm charges the unconstrained monopoly price.<sup>10</sup> The wage rate of the worker is  $w$ . Production technology for each intermediate goods producer is one-for-one in labor:

$$y = l. \quad (3)$$

*Politically Unconnected Firms.* Regulatory or bureaucratic burdens are represented as a wedge  $\tau \geq 0$  that increases the marginal cost of production from  $w$  to  $(1 + \tau)w$ , as in Hsieh and Klenow (2009). Therefore, a monopolist maximizes profit subject to a demand function as follows:

$$\pi^n = \max_l \{ py - (1 + \tau)wl \}, \quad \text{s.t. } p = q^\beta y^{-\beta} \text{ and (3).}$$

The first column in Table I lists optimal choices of labor, revenue, and labor productivity (revenue per labor) of the unconnected firm.

*Political Connections.* Firms can avoid regulations and bureaucracy costs by forging political connections. If a firm gets connected, it avoids the cost of the wedge  $\tau$ , yet the political connection carries the cost  $w^p$ , which we treat as exogenous for now.<sup>11</sup> We can think of  $w^p$  as compensation paid to politicians or any other type of cost that a firm incurs to maintain its political connections. However, a firm must first become familiar with the political network before connections can be formed. We represent access to the political network with a state variable,  $s \in \{0, 1\}$ ;  $s = 1$  when the firm has access to the political network,  $s = 0$  when the firm has no access.

<sup>10</sup>This structure also gives us theoretical tractability since we do not have to worry about limit pricing.

<sup>11</sup>We endogenize this cost through Nash bargaining between a firm and a politician in Appendix A of the Supplemental Material.

TABLE I  
POLITICAL CONNECTIONS AND STATIC MOMENTS.

	Unconnected Firm	Connected Firm	Change
Labor:	$[\frac{(1-\beta)}{(1+\tau)w}]^{\frac{1}{\beta}} q$	$[\frac{(1-\beta)}{w}]^{\frac{1}{\beta}} q$	$\uparrow$
Revenue:	$[\frac{(1-\beta)}{(1+\tau)w}]^{\frac{1-\beta}{\beta}} q$	$[\frac{(1-\beta)}{w}]^{\frac{1-\beta}{\beta}} q$	$\uparrow$
Labor Productivity:	$\frac{(1+\tau)w}{(1-\beta)}$	$\frac{w}{(1-\beta)}$	$\downarrow$

If a firm is in state  $s = 1$  and is politically connected, then it maximizes profit as follows:

$$\pi^p = \max_l (py - wl - w^p), \quad \text{s.t. } p = q^\beta y^{-\beta} \text{ and (3).}$$

The second column in Table I lists optimal choices of labor, revenue, and labor productivity of the connected firm that faces no regulatory burden. The last column of Table I points out the direction of change in the relevant moments when an unconnected firm becomes connected. As seen, connected firms employ more labor and have larger revenue since they face no regulatory burdens. However, their labor productivity is lower. Hence, an important result here is that connections lead to growth in size, but not in labor productivity.

When do firms choose to get connected? Panel (a) in Figure 1 plots the profits of unconnected firms  $\pi^n = \pi(1 + \tau)^{-\frac{1-\beta}{\beta}} q$  and connected firms  $\pi^p = \pi q - w^p$ , where  $\pi \equiv \beta(\frac{1-\beta}{w})^{\frac{1-\beta}{\beta}}$ . Panel (b) plots the equilibrium connection decision and indicates the resulting static return—the outer envelope (i.e., the maximum) of the two lines.

Firms that have access to politicians (i.e.,  $s = 1$ ) choose to get connected if  $\pi^p(q) > \pi^n(q)$ . Since both profits are linear in  $q$ , the static equilibrium is such that firms have a threshold ( $\hat{q}^s$ ) and get connected if and only if

$$q > \hat{q}^s \equiv \frac{w^p}{\pi(1 - (1 + \tau)^{-\frac{1-\beta}{\beta}})}.$$

Hence, larger firms optimally become connected in order to remove regulatory burdens. For the sake of simplicity, we will assume  $\beta = 0.5$  for the rest of this section, and we

(a) Profits of Connected and Unconnected Firms      (b) Static Connection Decision

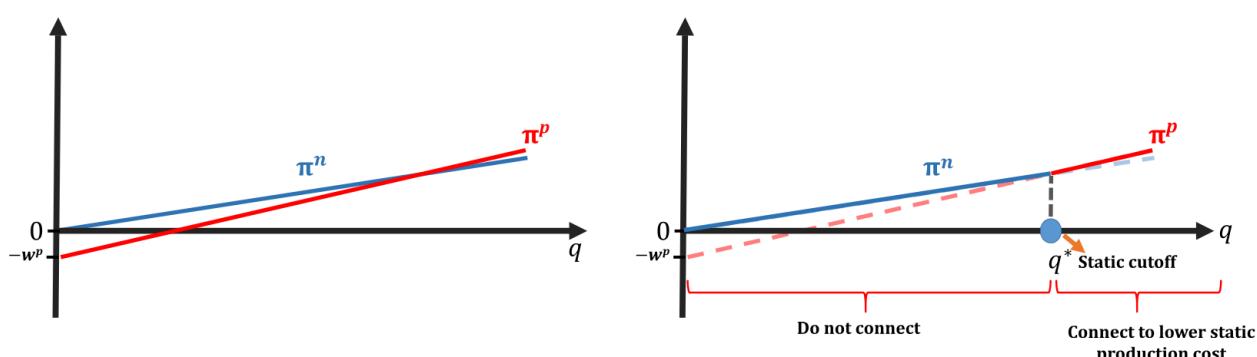


FIGURE 1.—Connection decision in a static environment.

rewrite the static threshold as

$$\hat{q}^s = \frac{w^p}{\pi} \frac{1 + \tau}{\tau}. \quad (4)$$

Note that the threshold declines as the regulatory burden  $\tau$  increases, implying that firms are more likely to be connected in more-regulated industries.

We summarize two main implications so far:

**Implication (i):** Large firms are more likely to get politically connected.

**Implication (ii):** After getting politically connected, firms grow in terms of employment and revenue, but not in terms of labor productivity.

Notice how these two implications illustrate that the relationship between political connections and firm size is bidirectional in the model. As firms grow in size, the cost of political connections becomes more appealing as regulatory burdens increase, so larger firms are more likely to be connected. Once large firms are connected, they grow more easily and become even larger.

### 3.2. Dynamics

Accessing the political network takes time. We assume that a share  $\alpha$  of entrants starts with  $s = 1$ , and  $1 - \alpha$  with  $s = 0$ . Firms switch from state  $s = 0$  to  $s = 1$  at the Poisson arrival rate  $\zeta$ . We assume that  $s = 1$  is an absorbing state. At each moment, a potential entrant receives a new innovative idea at Poisson arrival rate  $p$  and can produce a new vintage. A new idea of quality  $\lambda$  improves on the most-recent vintage of quality  $q_M$  as follows:

$$q_{M+1} = (1 + \lambda)q_M,$$

where  $\lambda \sim F(0, \infty)$  is the realization of innovation quality that is distributed according to distribution  $F(\cdot)$ .

Importantly, not all entrants with a better-quality product will be able to replace existing incumbents.<sup>12</sup> For an entrant to replace the incumbent, the entrant's quality-adjusted cost must be lower. When the entrant's and incumbent's political connections are asymmetric, an entrant's product must be of much better quality to beat the cost advantage of the incumbent, who is immune to regulatory costs.

To see this, consider the following three cases. In the first case, if the incumbent has no political connection, the system reduces to the standard Schumpeterian economy (Aghion and Howitt (1992)), in which new firms replace incumbents at the rate  $p$ . If both incumbent and entrant are connected, the case is similar: any quality improvement by  $\lambda > 0$  will lead to creative destruction at the rate  $p$ . In the asymmetric case in which the incumbent is connected and the entrant is not, we will see that the process of creative destruction is impeded, since the entrant must produce a superior technology and spend resources on the regulatory burden to succeed.

To formally show this, let us begin with the price competition between the entrant  $M + 1$  and incumbent  $M$ . The demand for each vintage is given by (2). The entrant must have a better ratio of quality to price to beat the incumbent in the pricing game:

$$\frac{q_{M+1}}{p_{M+1}} > \frac{q_M}{p_M}. \quad (5)$$

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<sup>12</sup>If a vintage cannot enter the market, we assume that the vintage is lost; that is, ideas are implemented immediately or disappear.

Now we can seek a quality threshold for innovation  $\lambda^*$  at which the entrant is guaranteed to produce, in equilibrium. In the price competition, the lowest price that the incumbent can charge is  $w$ , whereas the entrant's lowest possible price is  $(1 + \tau)w$ . Since the entrant's quality is  $q_{M+1} = (1 + \lambda)q_M$ , the condition in (5) gives us the innovation-quality threshold  $\lambda^*$ , above which entrants successfully replace incumbents:  $\lambda > \lambda^* \equiv \tau$ . Since the incumbent's political connections give a cost advantage, the entrant has to overcome this advantage with innovation. This threshold is equal to the regulatory advantage of the incumbents, which is  $\tau$ .

Now we have the formal tools to model the incumbent's decision to forge connections in this dynamic environment. To write down the value function, we will pose that the firms follow a cutoff rule, such that firms with  $q > \hat{q}^d$  decide to get connected. We will ultimately solve for the dynamic threshold  $\hat{q}^d$ . First, consider a firm with  $q < \hat{q}^d$  and denote its value by  $V_{-1}$ . Then

$$rV_{-1}(q) = \pi(1 + \tau)^{-1}q - pV_{-1}(q),$$

where  $r > 0$  is the exogenous interest rate. This value function simply equates the safe return  $rV_{-1}(q)$  to the risky return on the right-hand side. Firms collect instantaneous profits and get replaced at the rate  $p$ , in which case they exit. Rearranging this value function implies

$$V_{-1}(q) = \frac{\pi(1 + \tau)^{-1}}{r + p}q. \quad (6)$$

Intuitively, firm value decreases as the regulatory burden  $\tau$  and rate of creative destruction  $p$  increase.

Denote by  $V_0$  the value of a firm with quality above the threshold  $q \geq \hat{q}^d$  that does not have political access ( $s = 0$ ). We can express this value as

$$rV_0(q) = \pi(1 + \tau)^{-1}q - pV_0(q) + \zeta(V_1(q) - V_0(q)).$$

This value function is very similar to (6), with the exception that firms without political access will gain access at the rate  $\zeta$ .

For a firm in state  $s = 1$  with  $q \geq \hat{q}^d$ , the value function is

$$rV_1(q) = \pi q - w^p - p \left[ \underbrace{\alpha}_{\text{connected}} + \underbrace{(1 - \alpha) \Pr(\lambda > \lambda^*)}_{\text{unconnected but major innovation}} \right] V_1(q). \quad (7)$$

The incumbent is replaced at a different rate now. If the entrant has political access (with probability  $\alpha$ ), any innovation is sufficient to replace the incumbent. If the entrant has no political access (with probability  $1 - \alpha$ ), the entrant is disadvantaged by the regulatory burden. In this case, the entrant has to come up with a sufficiently novel innovation ( $\lambda > \lambda^*$ ) to overcome the regulatory disadvantage, which happens with probability  $\Pr(\lambda > \lambda^*)$ .

Rearranging (7) delivers

$$V_1(q) = \frac{\pi q - w^p}{r + p[\alpha + (1 - \alpha) \Pr(\lambda > \lambda^*)]}. \quad (8)$$

Firms connect to politicians if and only if getting connected offers more value than staying unconnected:  $V_1(q) > V_{-1}(q)$ . Using (6) and (8), this condition holds if and only if

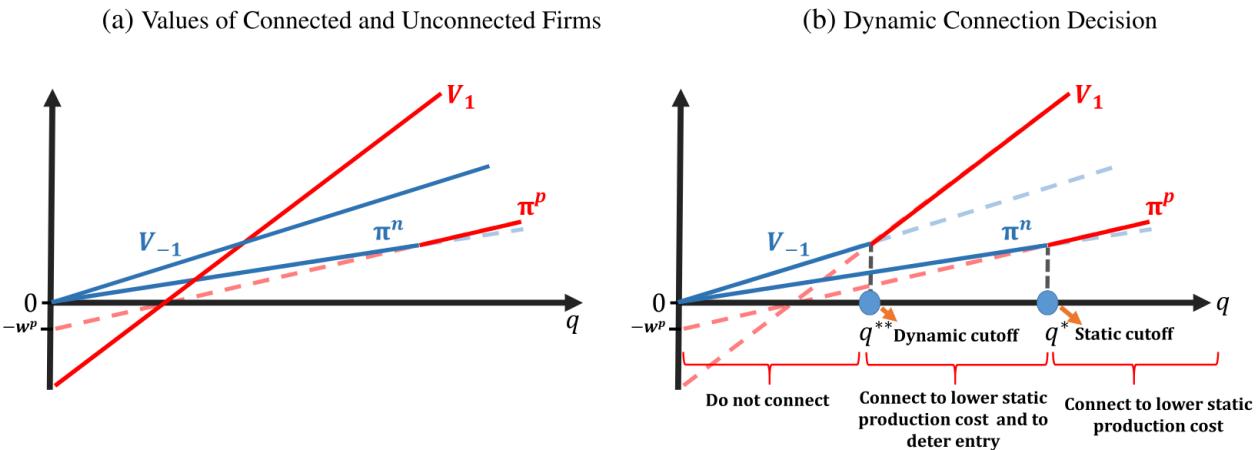


FIGURE 2.—Connection decision in a dynamic environment.

the quality level is above the dynamic threshold  $\hat{q}^d$ :

$$q > \hat{q}^d \equiv \frac{w^p}{\pi \left[ 1 - \frac{r + \tilde{p}}{r + p} \frac{1}{1 + \tau} \right]}, \quad (9)$$

where  $\tilde{p} \equiv p[\alpha + (1 - \alpha) \Pr(\lambda > \lambda^*)]$ . As in the static case, firms choose to form political connections if they are larger and/or if the regulatory burden  $\tau$  is larger.

*Preemptive Motive.* Now we can compare the static cutoff in (4) to the dynamic cutoff in (9):<sup>13</sup>

$$\hat{q}^s = \frac{w^p}{\pi \left[ 1 - \frac{1}{1 + \tau} \right]} > \hat{q}^d = \frac{w^p}{\pi \left[ 1 - \frac{r + \tilde{p}}{r + p} \frac{1}{1 + \tau} \right]}.$$

We see that  $\hat{q}^d < \hat{q}^s$ , as illustrated in Figure 2. In the region with  $q \in [\hat{q}^d, \hat{q}^s]$ , firms encounter an additional preemptive motive to acquire political connections. Incumbents anticipate that, by getting connected, they discourage entry and survive longer, hence they optimally choose to seek connections earlier. Notice that the difference between the two cutoffs comes from the term  $\frac{r + \tilde{p}}{r + p}$ , and it disappears if  $\alpha \rightarrow 1$ , that is, if all entrants have political access. Likewise, if there is no regulatory burden ( $\tau = 0$ ), the static and dynamic thresholds collapse to the same value,  $\hat{q}^d = \hat{q}^s$ . In these two extreme cases, there is no room for strategic entry deterrence. Hence, strategic motives kick in when the industry is heavily regulated (i.e.,  $\tau \uparrow$ ) or when the asymmetry in access between incumbents and entrants is large (i.e.,  $\alpha \downarrow$ ).

Finally, we discuss the equilibrium creative destruction rate, which is:

$$\text{Entry rate} = \begin{cases} p & \text{if incumbent is not connected,} \\ \tilde{p} = r + p[\alpha + (1 - \alpha) \Pr(\lambda > \lambda^*)] & \text{if incumbent is connected.} \end{cases}$$

Since  $\tilde{p} < p$ , connected incumbents are less likely to exit. Notice that if  $\alpha = 1$  so that all entrants have access to the political network, creative destruction is equal to entry rate

<sup>13</sup>Note that  $\pi^p > 0$  when  $q > \hat{q}^d$ . Hence, connected firms never make any static loss in equilibrium.

*p.* In fact, politically connected incumbents are more likely to be replaced by connected entrants.<sup>14</sup> Hence, the coexistence of red tape ( $\tau$ ) and asymmetric political access ( $\alpha < 1$ ) are the factors that impede creative destruction.

These considerations lead us to formulate the following:

**Implication (iii):** Politically connected firms are less likely to exit than unconnected firms.

**Implication (iv):** In industries where incumbents are politically connected, creative destruction is lower, and entrants are more likely to be politically connected.

Finally, we summarize last observations at the industry level. Similarly to the baseline Schumpeterian model, only entrants innovate in this model. Consequently, industries with connected incumbents have lower innovation rates. In addition, because transition from state  $s = 0$  to  $s = 1$  is governed by a Poisson process, conditional on size, older firms are more likely to be connected. As a result, we have the following:

**Implication (v):** Industries dominated by politically connected firms have older firms and lower productivity growth.

The model generates additional intuitive predictions when we allow  $w^p$  to be a politician's compensation determined endogenously as a result of Nash bargaining between the firm and the politicians with heterogeneous political powers,<sup>15</sup> namely, that (i) compensation increases with the political power of a politician; and (ii) connections with more-powerful politicians increase the firm's likelihood of survival.

### 3.3. Taking Stock and Alternative Mechanisms

A basic extension of a Schumpeterian creative destruction model with political connections provides some new theoretical insights into understanding the social costs of political connections. Even if we consider a “well-intended” nature of political connections that help firms remove red tape, a simple glimpse into the dynamic effects of mis-allocation uncovers important aggregate costs. Statically, similar to the “greasing wheels” idea, connections are socially beneficial since they reduce market frictions. However, the model uncovers two new intuitions in a dynamic environment. First, creative destruction endogenously decreases in response to asymmetries in wedges between entrants and incumbents, caused by unequal political access. Second, this mechanism creates additional strategic incentives for market leaders to use political connections to prolong their lead. As a result, markets with politically connected incumbents will see reduced market entry and reallocation, eventually becoming dominated by older and larger firms that innovate little and stagnate in productivity.

Our model implications help distinguish our mechanism from an alternative mechanism in which political connections help firms advance productivity, for example, by reducing effective innovation costs or helping introduce innovations to the market.<sup>16</sup> Against the

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<sup>14</sup>Conditional on being replaced, a connected incumbent is replaced by a connected entrant with probability  $\frac{\alpha}{\alpha + (1-\alpha)\Pr(\lambda > \lambda^*)} > \alpha$ , which is the probability for an unconnected incumbent.

<sup>15</sup>See Appendix A of the Supplemental Material for further details.

<sup>16</sup>Some alternative assumptions on the use of connections could give us similar set of implications. For example, we could assume that incumbents use connections purely to block entry, perhaps by influencing entry policies (directly altering  $p$ ), or that connections help getting procurement contracts (introducing demand wedges,  $\tau^y$ ). We do not incorporate these channels in our theoretical framework for two reasons. First, we lack empirical evidence for the direct-blocking effect, and the government-demand channel does not appear to be an empirically leading channel in our large-scale data for the entire economy (see Section 6.2). Second, even if we considered these channels, the implications for social costs from lower reallocation would be the

current implications, this alternative mechanism would imply that at the firm level, connections and innovation go hand-in-hand, and that firms grow in both size and productivity as a result of political connections. In the next sections, we study a new large-scale and granular data set from Italy to document empirical facts, guided by the implications from the theory.

#### 4. DATA AND DESCRIPTIVE STATISTICS

We tap data from multiple administrative sources to build a comprehensive data set about firms, workers, and local politicians in Italy, covering the years 1993–2014. The core of this data construction is newly available individual-level data from the Italian Social Security Administration (INPS). We combined this rich Social Security (SS) data with administrative data on firms' financial statements (Cerved) to obtain a detailed matched employer-employee data set for Italy. On the firm side, the data are further augmented with information on firm-level innovation derived from patent records in PATSTAT. On the employee side, we combine SS data with individual records on the universe of local politicians from the Italian Registry of Local Politicians (RLP). This allows us to identify whether a politician was employed in the private sector while holding office, helping us define firm-level political connections. Finally, we also gather data about all local elections in Italy held between 1993 and 2014. Together, the RLP and elections data allow us to define various attributes of an individual's political career, such as position, rank, party affiliation, and participation in marginally contested elections. Below, we provide an overview of the data. We delegate a more detailed discussion of data cleaning and variable construction to Appendix B of the Supplemental Material. Table II shows a summary of our data sources.

##### 4.1. Data Sources

*Data Set #1: Social Security Data (INPS).* We access the Italian Social Security data at the Italian National Institute of Social Security within the VisitINPS Scholars program. INPS data cover the universe of private sector workers whose employers make Social Security contributions. Part-time workers and temporary-contract workers are included, while the self-employed, public employees, agricultural workers, and contractors are not. These data provide us information about both employees and firms.

On the employee side, the Social Security data provide complete information on employment history and demographics. The following information is included: employer's identity, job start and separation dates, gross labor income (including bonuses and overtime), number of weeks worked in a year, type of contract (e.g., full-time or part-time, permanent or temporary), and broad occupational descriptions.

We aggregate the employee data to learn about firms, constructing reliable variables for firm size, average wages paid, and various labor compositions. We have each firm's industry classification (ATECO 2007, which corresponds to Nace Rev. 2), location, and entry and exit dates.<sup>17</sup> These data allow us to construct aggregate moments about firm entry, exit, and turnover across industries, locations, and time.

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same. Quantifying the relative importance of these various channels is an important question that we leave for future research. For now, we wish to focus on documenting the tradeoff between the static benefits of political connections and the dynamic costs of impeded reallocation and innovation.

<sup>17</sup>We cannot identify establishments using these data, hence our unit of analysis is a firm. However, in Italy the average number of establishments per firm is just 1.07 (Istat, Census 2011 data).

TABLE II  
DATA SOURCES.

Data	Source	Content	Time Span	Variables
1. Social Security	INPS	Individual-level: Universe of private sector employees (no contractors & agriculture)	1985–2014	Employment history, labor income, job characteristics, demographics
		Firm-level: Universe of firms with at least one paid employee (except agriculture)		Entry, exit, size, workforce characteristics, industry, location
2. Firm Financials	Cerved	Universe of limited companies	1993–2014	Balance sheets, income statements
3. Patent Data	PATSTAT	All EPO patents filed by Italian firms	1990–2014	Patent grant status, patent families, technology classification, citations, claims
4. Registry of Local Politicians	Ministry of Interior	Universe of local politicians (regional, province, municipality)	1985–2014	Political position attributes, party affiliation, demographics
5. Elections Data	Ministry of Interior and own collection	Regional, province, municipality election outcomes	1993–2014	Candidates, parties, coalitions, vote shares, seats

*Data Set #2: Firms' Financials (Cerved).* We use proprietary firm-level data administered by Cerved Group. The data provide balance sheets and income statements for all incorporated firms in Italy during our period of interest. Sole proprietorships, small household producers, or unincorporated partnerships are not covered. We make use of standard variables such as assets, intangible assets, value added ( $VA$ ), and profits. We compute a firm's labor productivity,  $LP$ , as the value added per worker. Total factor productivity,  $TFP$ , is calculated as the residual  $z$  from the standard Cobb–Douglas specification  $Y = zK^\alpha L^{1-\alpha}$ , where  $Y$  is the observed value added,  $K$  is the observed total assets,  $L$  is employment, and the labor share  $1 - \alpha$  is equal to the average industry-level labor share from the data.<sup>18</sup>

*Data Set #3: Patent Data (PATSTAT).* Our patent data come from the European Patent Office Worldwide Patent Statistical Database (EPO PATSTAT) covering all patents (granted or not) published before spring 2016. For all patents, we extract information on their patent families, technology classification, application date, grant status, and backward and forward citations. By matching with the Cerved data, we identify 13,904 firms with patent records in PATSTAT. We construct various measures of innovation at the firm level with the patent data: (i) the count of patent applications; (ii) citations-adjusted patent counts; and (iii) family-size-adjusted patent counts. Citation counts and the patent family size, which indicates the extent of geographical protection sought by a patent, serve as proxies for patent quality.

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<sup>18</sup>We also consider production function estimation-based TFP measures (Wooldridge (2009)), and find similar results. See Syverson (2011) for the discussion of various measures of productivity.

TABLE III  
STATISTICS ON LOCAL POLITICIANS.

Category	Position	Percent
<i>Regional Rank</i>	Region	0.85%
	Province	2.59%
	Municipality	96.56%
<i>Hierarchical Rank</i>	Mayor, President, Vice-mayor, Vice-president	11.30%
	Executive councilor	19.60%
	Council member	69.10%
<i>Majority Affiliation</i>	Majority	75.67%

*Note:* Summary statistics on the distribution of politicians across regional rank, hierarchical rank, and local majority affiliation from the Registry of Local Politicians (RLP). Statistics are from the period between 1993 and 2014 with 2,888,480 observations on 515,201 distinct politicians.

*Data Set #4: Registry of Local Politicians (RLP).* We accessed the Registry of Local Politicians (RLP) through the website of the Ministry of the Interior. The RLP contains information on all local politicians at the municipal (8110 municipalities), provincial (103 provinces), and regional (20 regions) levels from 1985 to 2014. For each politician, we have details about demographic information, location, position (e.g., council member, mayor, regional president, vice-president, etc.), and appointment date. We define an individual's *majority affiliation*—whether a politician is a member of the majority party (or coalition) at the local level. Table III reports the distribution of local politicians by their majority affiliation and hierarchical and regional ranks.

*Data Set #5: Elections Data.* We take data about elections at the regional, province, and municipal levels from the Ministry of Interior and complement them with data we have collected from various online archives. The final data set covers all local elections during the period 1993–2014, and includes the identities of all mayoral/presidential candidates (names and demographics); parties/coalitions participating in the elections and candidates that they support; candidate and party votes; and the allocation of council seats. We use these data to identify marginally contested elections and identities of winning and losing parties/coalitions, as discussed in Section 5.3.

#### 4.2. Descriptive Statistics

We link individual politicians listed in the RLP to the INPS data to identify a firm's connections based on the employment of local politicians contemporaneous with their terms of office. Specifically, we define the following indicators:

$Connection_{it}$ : = 1 if at least one politician is employed by firm  $i$  at time  $t$ ;  $Connection_{majority_{it}}$ : = 1 if at least one politician from the majority party/coalition at local level is employed by firm  $i$  at time  $t$ ;  $Connection_{high-rank_{it}}$ : = 1 if at least one high-ranking politician—(vice-)mayor, region or province (vice-)president, or a (vice-)president of a council—is employed by firm  $i$  at time  $t$ .

Almost 10% of politicians employed in the firms hold top or middle-management positions, while 55% perform other white-collar jobs.<sup>19</sup> In 63% of cases, firms become connected when an employee gets elected; in the remaining cases, a politician already in

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<sup>19</sup> Appendix Table B.III of the Supplemental Material provides more details about the politician-employees.

TABLE IV  
SUMMARY STATISTICS OF THE MATCHED FIRM-LEVEL DATA.

	All firms			With balance sheet		
<i>Panel A: Number of Observations</i>						
Years	1993–2014			1993–2014		
Observations (firms × year)	32,776,800			7,902,705		
Unique firms	4,457,672			1,084,618		
Observations (firms × year), connected firms	469,263			275,112		
Unique firms ever-connected	118,445			70,668		
Variable	Mean	Median	St dev	Mean	Median	St dev
<i>Panel B: Variables From INPS (Data #1)</i>						
Employment	7.223	2.000	129.005	18.481	5.000	213.193
Average weekly pay, thous. €	0.357	0.346	3.545	0.440	0.415	0.388
Employment growth	0.125	0.000	0.782	0.069	0.000	0.633
<i>PANEL C: Variables From Cerved (Data #2)</i>						
Assets, thous. €	–	–	–	3198.352	768.080	8171.213
VA growth	–	–	–	0.167	0.016	0.800
LP growth	–	–	–	0.098	–0.018	0.686
TFP growth	–	–	–	0.064	–0.020	0.554
<i>Panel D: Variables From PATSTAT (Data #3)</i>						
Num. patents (yearly)	2.113	1.000	5.028	2.114	1.000	5.042
Num. family-size-adj. patents (yearly)	11.304	5.000	28.183	11.361	5.000	27.979
Num. citations-adj. patents (yearly)	4.286	1.000	21.657	4.229	1.000	20.606
<i>Panel E: Variables From the Registry of Local Politicians (Data #4)</i>						
Connection	0.014	0.000	0.119	0.035	0.000	0.183
Connection high-rank	0.002	0.000	0.040	0.004	0.000	0.059
Connection majority	0.008	0.000	0.091	0.020	0.000	0.138
Num. politicians (cond on employing)	1.759	1.000	6.841	1.780	1.000	6.947
Num. majority-politicians (cond on employing)	0.896	1.000	3.517	0.892	1.000	3.623
Num. high-rank politicians (cond on employing)	0.152	0.000	0.882	0.132	0.000	0.860

*Note:* Summary statistics of the matched data at the firm × year level. The columns under “All firms” report statistics for all firms in the INPS data, our largest baseline sample. The columns “With balance sheet” present statistics for all observations where balance sheet information is not missing (observations matched to Cerved). All nominal variables are expressed in thousands of 2014 Euros. Employment is defined based on the number of employees in March. Employment growth is computed as  $gr_{it} = (empl_{it} - empl_{it-1})/[0.5 \times (empl_{it} + empl_{it-1})]$  as in Davis, Haltiwanger, and Schuh (1998). The “All firms” sample includes also firms that report zero employment in a particular year but still appear in INPS data. Number of observations with non-zero employment is 27,982,454 (employment growth excluding zero-employment observations is significantly lower, so a bulk of positive growth comes from entry years). Average weekly pay is the average gross weekly pay of all workers employed in March. Patent-related variables are defined in Section 4.1. The statistics on number of patents are given conditional on patenting. Definitions of Connection, Connection high-rank, and Connection majority are given in Section 4.2. The statistics on number of politicians employed are given conditional on having a connection. Standard balance sheet variables are defined in Section 4.1; they are winsorized at the top and bottom one percentiles.

office is hired by the firm. We report summary statistics of the final matched data set for the period 1993–2014 in Table IV. In total, we have about 32 million observations at the firm level, with 4 million unique firms in 1993–2014. Among these, 1 million firms match to Cerved so that financial data are available.

Firm-level political connections are widespread. In total, 112,333 unique firms can be identified as connected at some point in their existence. Conditional on being connected, the average number of politicians employed per year is 1.7. The average share of connected firms by industries is around 4.5%, though connected firms account for 33.6% of

employment across industries. Hence, connections are particularly common among large firms: 45% of firms with more than 100 workers are connected with politicians. Conditional on size, older firms are more likely to be connected than younger firms.

## 5. EMPIRICAL ANALYSIS

The empirical results of this section are organized around the theoretical implications discussed in Section 3. We begin by observing firms' use of innovation or political connections as a function of the firms' market position. Second, we examine firm-level outcomes from political connections. Third, we study politicians' wage premiums and estimate the extent of rent sharing between firms and the politicians they employ. Taken together, our micro-level empirical results give evidence for the explanatory power of the main mechanism in our model. Firms primarily spend resources on political connections to obtain preferential treatment, which those firms do not use to innovate or advance productivity.

### 5.1. *The “Leadership Paradox”*

This section gives our evidence for the first implication of the model. We consider the top 20 firms in a market ranked on employment share. A market is defined at the (6-digit) industry  $\times$  region  $\times$  year level. Figure 3 plots the average intensities of political connections and innovation over firms' market rank. Politicians intensity is defined as the number of politicians employed by a firm, normalized by 100 white-collar employees.<sup>20</sup> Innovation intensity is the number of patent applications published in a year, again normalized by 100 white-collar employees. Both outcome variables are adjusted for industry-, region-, and year-fixed effects. We also plot regression lines from regressing outcome variables on market rank, controlling for industry-, region-, and year-fixed effects. We document a “leadership paradox”: dominant market leaders engage less in innovation but increasingly rely on political connections.

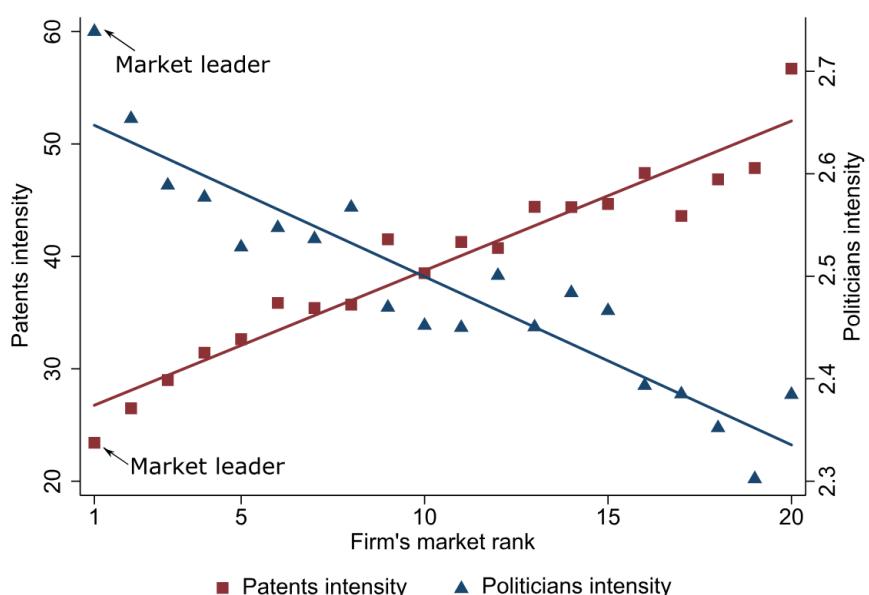


FIGURE 3.—Leadership paradox: market rank, innovation, and political connection.

<sup>20</sup>Since politicians are mostly employed in white-collar positions, we normalize by the number of white-collar workers in a firm. However, normalizing by total employment does not alter results significantly.

This “leadership paradox” is robust to many alternative specifications that are presented in Appendix C of the Supplemental Material. We measure innovation intensity using quality-adjusted patent filings, where quality is measured by patent citations or patent family size, or using intangible assets over a firm’s value added. We also consider majority-level politician-employees for our definition of politician intensity. We also consider different definitions of market rank by calculating market share based on value added or by defining the market at the industry level, so excluding the regional dimension. Finally, we show that the relationship is also present outside the top 20 firms in the market. Innovation intensity declines monotonically, while politician intensity increases monotonically with a firm’s market rank.

The following empirical fact supports our first theoretical implication, that larger firms are incentivized toward political connections to reduce market frictions and preempt competition from market entrants.

**FACT 1:** *Market leaders are the most politician-intensive but the least innovation-intensive, relative to their direct competitors.*

## 5.2. Connections and Firm Outcomes: Evidence From Universe of Private-Sector Data

We next turn to political connections’ effects on firm outcomes. We evaluate firm growth in terms of both size and productivity to discern whether connections help or hinder technological progress. Our model points out that if firms use their connections to push the technological frontier, we should observe that employment growth is coupled with productivity growth. Alternatively, if political connections are used to gain preferential treatment (as our theoretical model suggests) or to directly eliminate competition, workers freed up from competitors would be reallocated to connected firms. In the data, such growth in employment would be detached from productivity growth.

We start with an analysis of data covering the whole Italian economy. In the next section, we zoom into a specific setting that offers exogenous variation in the power of political connections.

### Political Connections and Firm Growth

In Table V, we estimate the following regressions:

$$y_{it} = \beta_0 + \beta_1 Connection_{it} + \beta_2 Connection\ majority_{it} + \zeta \mathbf{x}_{it} + \eta \mathbf{x}_t + \gamma \mathbf{x}_i + \varepsilon_{it}, \quad (10)$$

where  $y_{it}$  is firm  $i$ ’s growth from  $t$  to  $t + 1$ . The main explanatory variables  $Connection_{it}$  and  $Connection\ majority_{it}$  are dummy variables that were defined in Section 4.2.  $\mathbf{x}_{it}$  includes time-varying firm-level controls—log total assets, log size (employment), and age.  $\mathbf{x}_t$  includes time dummies, while  $\mathbf{x}_i$  includes firm region and industry dummies or firm fixed effects.

Columns 1 to 4 of Table V report results for growth in size in terms of employment and value added, while columns 5 to 8 report results for growth in productivity in terms of labor productivity and TFP. Both OLS and within-firm regressions show that connected firms’ employment grows 3% faster, on average. Being connected with a majority party is associated with an additional 0.3 percentage points in employment growth. Connected firms also grow 1 to 4 percentage points faster in value added. This growth in size is not accompanied by corresponding growth in productivity. We see that connections are asso-

TABLE V  
POLITICAL CONNECTIONS AND MEASURES OF FIRM GROWTH.

	(1) Empl (OLS)	(2) Empl (FE)	(3) VA (OLS)	(4) VA (FE)	(5) LP (OLS)	(6) LP (FE)	(7) TFP (OLS)	(8) TFP (FE)
Connection	0.032 (0.001)	0.040 (0.002)	0.039 (0.002)	0.014 (0.002)	-0.014 (0.002)	-0.028 (0.002)	-0.008 (0.001)	-0.019 (0.002)
Connection major	0.003 (0.001)	0.007 (0.002)	0.010 (0.002)	0.002 (0.002)	-0.001 (0.002)	-0.004 (0.003)	0.000 (0.002)	-0.003 (0.002)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	NO	YES	NO	YES	NO	YES	NO
Industry FE	YES	NO	YES	NO	YES	NO	YES	NO
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	6,545,131	6,585,740	5,684,519	5,710,338	5,598,367	5,623,077	5,271,002	5,291,979

*Note:* Firm-level regressions described in equation (10). Dependent variables are growth in employment (columns 1 and 2), value added (columns 3 and 4), labor productivity (columns 5 and 6), and TFP (columns 7 and 8) from time  $t$  to time  $t+1$ . TFP is calculated as described in Section 4.1. Main control variables are *Connection*—a dummy variable equal to 1 if the firm employs a politician, and *Connection major*—a dummy equal to 1 if the firm employs a politician from a majority party/coalition. The regressions, in addition, control for a firm's log assets, log size, age, as well as year-, region-, and industry-fixed effects in columns 1, 3, 5, and 7; and for year dummies and firm-fixed effects in columns 2, 4, 6, and 8. The data cover the years 1993–2014. Average length of political connections within firms is 4.2 years. Robust standard errors clustered at firm level reported in parentheses.

ciated with some decline in productivity growth, while the party affiliation of politician-employees has no significant effect.<sup>21</sup>

This disconnect between growth in size and growth in productivity also appears when we use other measures of firm size and productivity. In Appendix Table C.II of the Supplemental Material, we present similar positive results for growth in white-collar employment and profits and negative results for growth in intangibles intensity and patent applications.

Fact 2 summarizes our findings. Consistent with the main channel discussed in the model, Fact 1 and Fact 2 together suggest that the primary role of political connections is to help firms obtain preferential treatment that they do not necessarily use to innovate and advance productivity.

**FACT 2:** *At the firm level, political connections are associated with increased employment and revenue growth, but not with higher productivity growth.*

### *Firm Survival*

We also observe that political connections are associated with increased likelihood of firm survival. We estimate a Cox survival model in Table VI. Conditional on firm size, market share, and year and industry dummies, firms that are connected face less of an exit hazard. Survival probability increases even further if a firm is connected with a majority-party or high-ranking politician. Relative to unconnected firms, firms that are connected with high-rank politicians experience a 0.275 decline in the yearly-log hazard rate, while connection with a majority-party politician is associated with a 0.109 decline in the yearly log hazard rate. This is our Fact 3:

<sup>21</sup>Both in the model and in the data, our productivity measure is the revenue productivity. As a result, if connected firms have higher markups, all else equal, their (revenue) productivity should be higher, going against what we find. Hence, our evidence on the declining revenue productivity for connected firms puts a lower bound on the implied wedge  $\tau$ .

TABLE VI  
COX SURVIVAL ANALYSIS.

	Exit	Exit	Exit
Connection	-0.088 (0.010)	-0.064 (0.014)	-0.067 (0.010)
Connection major		-0.043 (0.019)	
Connection high-rank			-0.208 (0.033)
Other controls & Year, Industry FE	Yes	Yes	Yes
Observations	25,773,082	25,773,082	25,773,082

Notes: Cox proportional hazard model of firm survival as a function of connection status at a point in time. Definitions of *Connection*, *Connection major* and *Connection high-rank* are given in Section 4.2. Other controls are log employment, market share defined as share of a firm's employment in industry  $\times$  region  $\times$  year, and year and industry dummies. Efron method for tied failures is used. The survival model is estimated on the entire sample of INPS firms in the period 1993–2014. Standard errors in parentheses.

**FACT 3:** *Politically connected firms are more likely to survive, and their survival probability increases in the political power of the politicians they employ.*

### 5.3. Connections and Firm Outcomes. Regression Discontinuity Design

In the spirit of Lee (2008) and Akey (2015), we exploit quasi-random discontinuity caused by local elections decided on a thin margin to gauge the causality of our firm-level growth results. This method allows us to compare the post-election performance of two different firms that were politically connected with different competing parties immediately *before* a marginally contested election. Since the outcomes of closely contested elections can be considered as decided by pure chance, discontinuity in outcomes between marginally winning and losing firms *after* the election can be attributed to a causal effect of majority-party connections on firms' outcomes.

This methodology offers a unique opportunity to establish a causal link, but, clearly, the downside of this approach is that we focus on a specific context of marginal elections and cannot use the entire data for this analysis. However, jointly with our previous firm-level results leveraging the entire sample of firms over time, we get closer to a better understanding of the effects of political connections on firm outcomes. Before we go into the details of the methodology, it is useful to briefly describe the institutional setting of local elections in Italy and the identification of closely contested elections in our data.

*Elections at the Municipal Level.* Local elections are typically held every five years, and voters choose the mayor and members of the local council. Italy has about 8100 municipalities, with populations ranging from 100 inhabitants to 3 million inhabitants. Electoral laws vary somewhat depending on the size of a municipality. Elections generally use “one-shot” voting with a majoritarian system for both the mayor and council members. Votes are cast for mayor candidates and for the parties that support those candidates.<sup>22</sup> Votes cast for the candidates determine the mayor and the allocation of council seats between parties. Importantly, the winning candidate gets a majority premium, such that his/her

<sup>22</sup>In general, “split-ticket” voting is not allowed, except for in large municipalities.

party/coalition is guaranteed to have a majority of the seats on the council. After determining the total allocation of seats to a winning coalition, any further allocation of seats is determined by the votes cast for each party.

*Provincial Elections.* Elections are normally held every 5 years, and voters choose the province president and the composition of the provincial council. Electoral rules for province-level elections are very similar to the ones for large municipalities described above.

*Regional Elections.* Regional elections are generally held every 5 years in the twenty regions of Italy. Before 1995, voters did not directly choose a regional president. Instead, they cast votes for parties/coalitions that formed a council, and seats were allocated among parties proportionally.<sup>23</sup> However, since 1995, citizens cast votes for a presidential candidate, as well as for parties/coalitions that form the government (with lists running at the district or regional level). Runoffs are no longer possible. The coalition associated with a winning president is generally assured a majority of the seats in the government (at least 55%). The rest of the seats are determined by the number of votes cast for each party.

*Identifying Marginally Contested Elections.* The level of detail in our data allows us to identify elections that were contested on a thin margin. As described above, votes cast for the candidates (not for parties) determine the margin of victory and the identity of the majority party/coalition in a particular election. In most cases, the minimum threshold of votes is 50%, and if no candidate reaches that threshold, a runoff is expected. Important exceptions to the 50% threshold are elections in small municipalities with a population below 15,000 inhabitants, as well as in regional elections. In such cases, a second round is never held and the winner is the candidate receiving the largest share of votes in the first round.

We identify the marginal elections as follows: let  $p_1$  denote the share of votes obtained by a winner and  $p_2$  the share of votes held by the runner-up in a decisive election. We define the *margin of victory* as the difference between these shares:  $\text{margin of victory} \equiv p_1 - p_2$ .

During the 1993–2014 period, 36,513 municipal elections were held. Out of those, 19,589 were decided within a 20% margin, 5879 within a 5% margin, and 2395 within a very narrow 2% margin. At the provincial level, 239 out of 404 elections were decided within a 20% margin, and 69 and 16 within 5% and 2% margins, respectively.<sup>24</sup> This provides us with a large sample for regression discontinuity analysis. Analyzing elections data, we see no kinks in the victory margin distribution across elections, and we see no particular geographic concentration of marginal elections in Italy.

*Random Outcomes of Marginal Elections.* Our identification strategy relies on the randomness of election outcomes when the margin of victory is close to zero. A threat to this randomness could come from incumbency advantage—incumbent politicians may have higher chances of re-election even in tight contests. We examine this possibility by looking at the re-election probability of incumbent parties. If the outcomes of close elections cannot be anticipated, then the odds of winning for an incumbent party/coalition should be the same as odds of non-incumbents. Figure 4 plots the probability of re-election—the share of elections won by an incumbent party as a function of the margin of victory.

<sup>23</sup>As a result, we cannot define marginal elections for regional elections before 1995.

<sup>24</sup>At the regional level, 66 out of 92 elections were decided within a 20% margin, 23 were decided within a 5% margin, and just 10 elections were decided within a 2% margin.

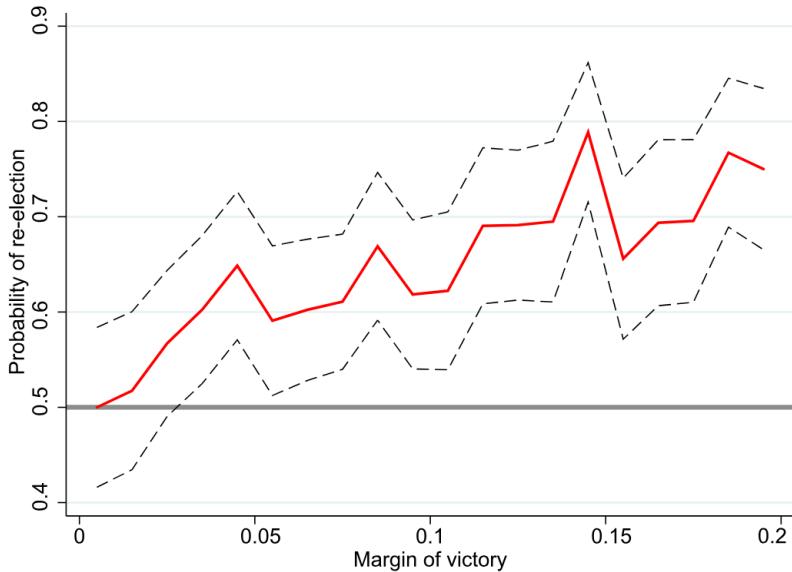


FIGURE 4.—Probability of re-election against the margin of victory. Notes: The share of elections won by an incumbent party against the margin of victory in those elections. *Re-election* is equal to 1 if a winning party is the same (or shares at least one common party, in the case of coalitions) as an incumbent party/coalition that won the last election. Margin of victory is equal to the difference between share of votes received by a winning candidate minus the share of votes by a runner-up. The sample focuses on all the elections, where margin of victory is less than 0.2 and an incumbent party/coalition is either a winner or a runner-up.

The sample contains all those elections (within the 20% margin) where an incumbent party/coalition is either a winner or a runner-up. We see that elections with a wide victory margin feature a large incumbency advantage in terms of re-election. However, closer to the zero margin of victory, the outcome of an election resembles a coin flip—an incumbent is exactly as likely to win as the other candidate.

Another potential concern could be that our identification of treated and control groups could be noisy if, in anticipation of a closely contested election, firms employ politicians from both competing parties. We screen for this possibility and find that only 4% of firms whose employees run for elections within 10% victory margin in  $t$ , simultaneously employ politicians from competing parties at  $t - 1$ . In subsequent analysis, we drop those observations.<sup>25</sup>

*Regression Specification.* Now we are ready to describe our econometric specification. Let  $m$  denote an election that has been decided with the margin  $\text{Victory margin}_m$ ,  $T(m)$ —the year in which it was held,  $y_{iT(m)}$ —the outcome variable (e.g., firm  $i$ 's employment or labor productivity growth from  $T(m)$  to  $T(m) + 1$ ), winning dummy  $\text{Win}_{iT(m)-1}$ —a dummy equal to 1 if firm  $i$  at time  $T(m) - 1$  employs a politician from a party that wins the election  $m$ . We ultimately estimate the following relationship:

$$\begin{aligned} y_{iT(m)} = & \alpha + \beta \text{Win}_{iT(m)-1} + f(\text{Victory margin}_m) + \delta_1 X_{iT(m)} \\ & + \delta_2 X_m + \delta_3 X_T + \nu_{iT(m)}, \end{aligned} \quad (11)$$

where  $f(\text{Victory margin}_m)$  is a polynomial function of the margin of victory of election  $m$  estimated on both sides of the threshold,  $X_{iT(m)}$  are firm-level controls, such as the

<sup>25</sup> Appendix Figure C.5 of the Supplemental Material plots the distribution of politician-workers across firms right before the election to further rule out anticipation effects.

firm's age and size at time  $T(m)$ ,  $X_m$  is a set of province dummies,  $X_T$  is a year dummy, and  $\nu_{iT(m)}$  is an error term. The parameter of interest  $\beta$  identifies the causal effect of the treatment (winning) at the threshold.

Our benchmark specification includes  $\text{Win}_{iT(m)-1}$  and  $f(\text{Victory margin}_m)$ . When the assignment of treatment is random, our estimate of  $\beta$  should be invariant to the inclusion of additional controls  $X_{iT(m)}$ ,  $X_m$ , or  $X_T$ , since they should be orthogonal to the treatment. We validate this assumption below and show our results with and without those additional controls. We follow the recent literature (see [Imbens and Lemieux \(2008\)](#) and [Cattaneo, Idrobo, and Titiunik \(2018\)](#) for an excellent review), and in our baseline results we approximate the regression functions above and below the threshold using local linear polynomials, with weights implied by triangular kernel. Hence, our benchmark  $f(\text{Victory margin}_m)$  is the first-order polynomial interacted with the winning dummy. The benchmark bandwidth is chosen following the optimal bandwidth choice of [Imbens and Kalyanaraman \(2012\)](#). We demonstrate robustness to different choices of the order of the local polynomial, the weighting function, and the bandwidth.

*Graphical Analysis.* We first illustrate the discontinuity at the threshold graphically in Panel (a) of Figure 5, where the outcome variable is firm-level employment growth. We plot a firm's growth from  $T$  to  $T + 1$  against margin of victory at time  $T$ . Positive margins of victory denote firms that were connected at time  $T - 1$  with a politician from a party that won the election at time  $T$  with a corresponding margin of victory. Likewise, negative margins of victory depict firms that are connected with losing politicians. The figure focuses on all the elections that were decided with no more than a 10% margin. For visibility, we divide the  $x$ -axis into 0.01-wide intervals of the margin of victory at time  $T$ . Each point denotes average growth of firms in that interval; the solid lines represent predicted flexible polynomial fits from a regression that includes third-order polynomial in margin of victory,<sup>26</sup> the winning dummy  $\text{Win}_{iT-1}$ , and an interaction of the dummy with the polynomial. Figures are normalized such that outcome variables for marginal losers at the threshold are equal to zero.

Panel (a) shows a large positive discontinuity at the zero victory margin, indicating that winners grow more than losers right after the tightly contested elections. This discontinuity estimate may underestimate the true causal effect of winning on growth from  $T$  to  $T + 1$  if the winning politicians are likely to exit firms by  $T + 1$  (due to increased demand on their time or because of poaching of the winning politicians from other firms). Indeed, we find that 30% of the winning politicians who are employed at the firms in  $T - 1$  exit these firms by  $T + 1$ . Hence, in Panel (c) we repeat the same plot, but dropping firms whose winning politicians exit the firm before  $T + 1$ . We again see a large positive discontinuity at the threshold. As expected, this discontinuity is even larger than in Panel (a).

Notice that the positive discontinuities seen in Panels (a) and (c) are mainly driven by particularly low growth of losing firms in a narrow set of very tightly contested elections. One may wonder why the firms connected with marginally losing politicians have lower post-election growth rates than firms connected with politicians whose parties lost by a wide margin; and why the growth of marginal winners is similar to the growth of firms winning with a wide margin. One potential explanation for these growth patterns could be related to the uncertainty effect in marginal election years. Relative to other times, tightly contested election years are characterized by heightened uncertainty ([Baker, Baksy, Bloom, Davis, and Rodden \(2020\)](#)). Since the increased uncertainty is likely to

<sup>26</sup>The fourth-order polynomial fits look very similar.

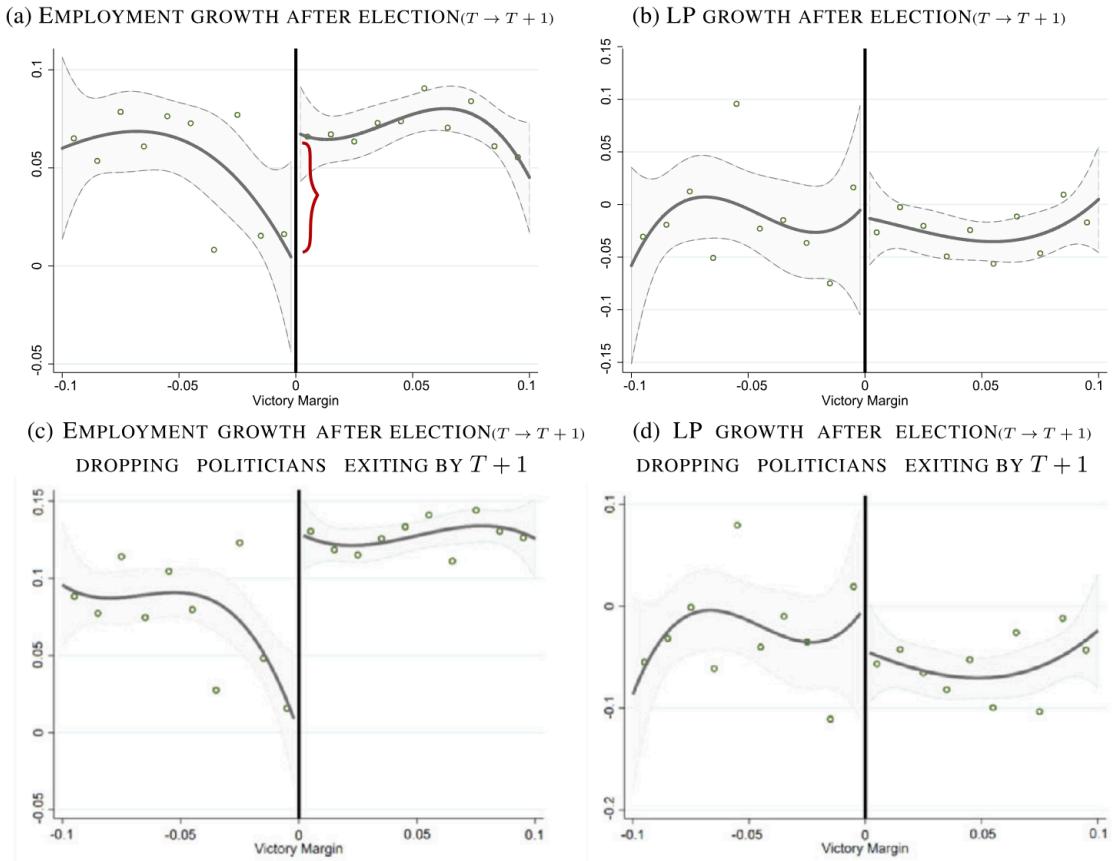


FIGURE 5.—Employment and labor productivity growth after election.

be associated with a lower future firm growth (Bloom, Bond, and Van Reenen (2007), Kang, Lee, and Ratti (2014)), this can explain the overall lower growth rates of connected firms in marginal elections compared to other elections.<sup>27</sup> Within the marginal elections, though, winners grow more than losers, a positive effect of winning that counteracts the negative election-year effect.

Our regression-discontinuity plots also confirm our causal interpretation of firm-level results on labor productivity growth. Panels (b) and (d) of Figure 5 show no positive effects of connections on productivity growth, consistent with the coefficient estimates on the majority dummy from the within-firm regressions in Table V.

*Regression Discontinuity Estimates.* Table VII reports the benchmark estimates from the RD specification in (11). Columns 1 and 3 correspond to the regression (11) including  $\text{Win}_{iT-1}$  and  $f(\text{Victory margin})$ , without additional controls. The coefficient of the winning dummy is large and significant for employment growth, translating into a 4-percentage-point difference in growth rates, which is economically considerable. The effect on productivity growth is negative and not statistically different from zero. Appendix Table C.III of the Supplemental Material repeats these benchmark regressions, dropping firms whose winning politicians do not stay until  $T + 1$ .<sup>28</sup>

<sup>27</sup>Our preliminary analysis shows that election years are associated with lower growth for connected firms. Results are available upon request.

<sup>28</sup>In Online Appendix, we also report RDD for other outcomes (Table C.IV) and the comparison of RDD estimates for newly-elected and existing politicians (Table C.V).

TABLE VII  
EMPLOYMENT AND PRODUCTIVITY GROWTH AFTER ELECTION. RD ESTIMATES.

	(1) Empl Growth	(2) Empl Growth	(3) LP Growth	(4) LP Growth
Win dummy	0.0392 (0.0178)	0.0408 (0.0169)	-0.0127 (0.0308)	-0.0140 (0.0299)
Age		-0.0000 (0.0003)		-0.0005 (0.0006)
Log Size		0.0018 (0.0033)		-0.0106 (0.0077)
$f(\text{Victory margin})$	YES	YES	YES	YES
Year FE	NO	YES	NO	YES
Province FE	NO	YES	NO	YES
Observations	19,449	19,346	10,429	10,414

*Note:* RD estimates for employment growth (columns 1 and 2) and labor productivity growth (columns 3 and 4) based on regression specification (11). Growth rates are defined from  $T$  to  $T + 1$ . In columns 1 and 3, regressions include win dummy,  $\text{Win}_{i,T-1}$ , and  $f(\text{Victory margin})$ —a linear polynomial interacted with win dummy. Columns 2 and 4 also include additional controls such as year and firm province fixed effects, log size, and age. The local linear regressions are estimated on the optimal Imbens and Kalyanaraman (2012) bandwidth and are weighted using a triangular kernel function. Robust standard errors are in parentheses.

Table VIII illustrates robustness to the choice of kernel function for local polynomial regression, polynomial order, and bandwidths. Panel A repeats our benchmark specification but uses uniform kernel weighting for the local linear regression; Panel B uses a second-order local polynomial approximation for  $f(\text{Victory margin})$ ; Panels C and D report benchmark results on 20% and 10% bandwidths. Our results are robust to these variations.

#### Tests for Quasi-Random Assignment

*Additional Controls.* Our identification strategy relies on the assumption that the assignment of the winner in marginally contested elections is random. This implies that marginally winning and marginally losing firms are comparable and should not show systematic differences in pre-determined covariates. We provide some tests to support the quasi-random assignment of our RD design. First, the inclusion of additional covariates in the regressions ( $X_{iT(m)}$ ,  $X_m$ ,  $X_T$  in equation (11)) should not change the main effect of the treatment. Indeed, after including additional controls, such as year and province fixed effects, log size, and age in columns 2 and 4 of Tables VII and VIII, we see that the magnitude of the main coefficients does not significantly change.

*Pre-Trends.* Next, we examine pre-trends in the outcome variables. Figure 6 illustrates RD plots similar to those above, but for the employment growth and labor productivity growth at  $T - 1$ , immediately before the election. We see no significant difference in pre-election growth rates at the threshold, which implies that the firms on the winning and losing sides do not show any systematic difference in main outcome variables prior to the election.

*Balancing Tests.* Last, we show balancing tests for various pre-determined firm-level variables at time  $T - 1$ . To analyze any discontinuity in the pre-determined covariates

TABLE VIII  
EMPLOYMENT AND PRODUCTIVITY GROWTH AFTER ELECTION. RD ROBUSTNESS.

	(1) Empl Growth	(2) Empl Growth	(3) LP Growth	(4) LP Growth
<i>Panel A. Uniform kernel function</i>				
Win dummy	0.0329 (0.0154)	0.0300 (0.0146)	-0.0153 (0.0279)	-0.0114 (0.0272)
<i>f</i> (Victory margin)	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
<i>Panel B. Second-order local polynomial</i>				
Win dummy	0.0482 (0.0278)	0.0556 (0.0262)	0.0060 (0.0491)	-0.0055 (0.0487)
<i>f</i> (Victory margin)	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
<i>Panel C. 20% victory margin bandwidth</i>				
Win dummy	0.0360 (0.0163)	0.0355 (0.0155)	-0.0098 (0.0285)	-0.0091 (0.0277)
<i>f</i> (Victory margin)	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
<i>Panel D. 10% victory margin bandwidth</i>				
Win dummy	0.0451 (0.0243)	0.0514 (0.0229)	0.0051 (0.0421)	-0.0047 (0.0416)
<i>f</i> (Victory margin)	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes

*Note:* Different panels illustrate robustness checks on the results reported in Table VII. Growth rates are defined from  $T$  to  $T + 1$ . In columns 1 and 3, the regressions include winning dummy,  $\text{Win}_{iT-1}$ , and  $f(\text{Victory margin})$ . Columns 2 and 4 also include additional controls such as year and firm province fixed effects, log size, and age. Panel A repeats the benchmark results but uses uniform kernel weighting for the local linear regression. Panel B employs a local polynomial regression of order 2. Panels C and D report benchmark results with 20% and 10% bandwidths. Standard errors are in parentheses.

at the zero margin threshold, we use the same techniques as in our benchmark RD setup. Specifically, for each covariate of interest, we employ a local linear estimation with optimal bandwidth and triangular kernel. We report estimates of discontinuity for the before-election firm size, value added, assets, intangible capital, labor productivity, profits, previous-period growth in size and productivity, age, and geographic location in various columns of Table IX. These results show that the treatment and control groups are comparable around the threshold. The only statistically significant difference emerges from firm age; however, the magnitude of one year is economically small.

#### 5.4. Politician-Employee Compensation

On average, politician-employees are paid 10% more, relative to their co-workers of the same gender and job type (white-collar or blue-collar). Provincial and regional politicians are paid much greater wage premiums, reaching 108% for female white-collar regional politicians.

Since differences in worker characteristics could account for these wage differentials, we perform an event study. We focus on employees who become politicians during their period of employment and look at the evolution of their wages in the same firm before

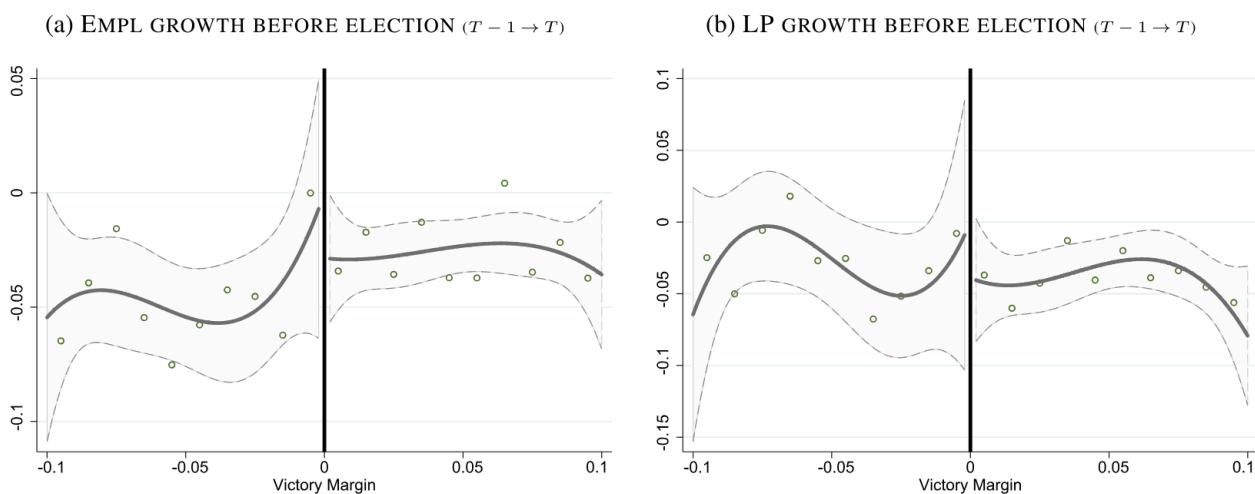


FIGURE 6.—Pre-trends in employment and labor productivity growth before election. Notes: Figure plots a firm's growth from  $T - 1$  to  $T$  against margin of victory at time  $T$ . Positive margins of victory denote firms that have been connected at time  $T - 1$  with a politician from a party that won an election at time  $T$  with the corresponding margin of victory. Likewise, negative margins of victory depict firms that are connected with losing politicians. For visibility, we divide the  $x$ -axis into 0.01-wide intervals of the margin of victory at time  $T$ , and each point denotes average outcome of firms in that interval. The solid lines represent predicted third-order polynomial fits from the regression that includes third-order polynomial in margin of victory, a dummy  $\text{Win}_{iT-1}$ , and an interaction of the dummy with the polynomial. The dashed lines represent 90% confidence intervals. Outcome variable in Panel (a) is employment growth, while Panel (b) depicts labor productivity growth. Figures are normalized such that outcome variables for marginal losers at the threshold are equal to zero.

and after they become politicians. An event, denoted by  $t = 0$ , is the year in which an individual becomes a politician for the first time; and the event time is indexed relative to that year. Following Kleven, Landais, and Sogaard (2018), we estimate the following

TABLE IX  
BALANCING TESTS.

Dependent variable:	Log Size	Log Value Added	Log Assets	Log Intangibles	Log Labor Productivity	Log Profits
Win dummy	0.0364 (0.0608)	-0.0449 (0.0739)	-0.0407 (0.107)	-0.0990 (0.158)	-0.0221 (0.0421)	-0.0789 (0.122)
$f$ (Victory margin)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,513	12,674	8351	8267	10,554	7784
Dependent variable:	Empl growth (last period)	LP growth (last period)	Age	Center	North	
Win dummy	0.0131 (0.0224)	0.0001 (0.0385)	-1.051 (0.561)	-0.0182 (0.0212)	0.0025 (0.0217)	
$f$ (Victory margin)	Yes	Yes	Yes	Yes	Yes	
Observations	16,104	7249	16,937	10,656	15,585	

Note: Table reports balancing tests for various pre-determined firm-level variables at time  $T - 1$  (before the election). Different columns report estimates of discontinuity for the before-election firm size, value added, assets, intangible capital, labor productivity, profits, growth in size, growth in productivity, age, and geographic location. For each covariate, we employ a local linear estimation with optimal bandwidth and triangular kernel (similar to our benchmark RD design from specification (11)). Robust standard errors are in parentheses.

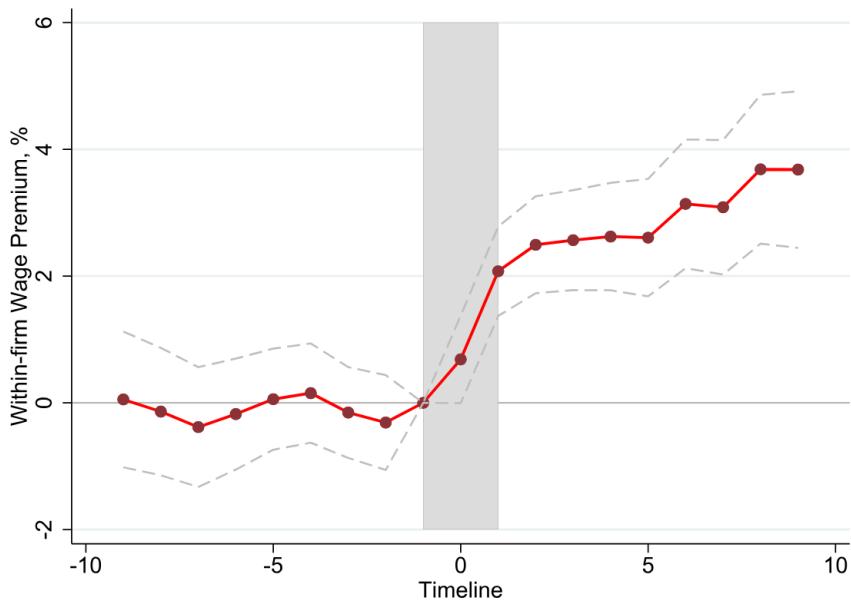


FIGURE 7.—Within-firm wage premium before and after becoming a politician.

specification for the event study in the 10-year window before and after the event within the same firm:

$$y_{ist} = \sum_{j \neq -1} \alpha_j \mathbf{I}[j = t] + \sum_k \beta_k \mathbf{I}[k = age_{ist}] + \sum_y \gamma_y \mathbf{I}[y = s] + \varepsilon_{ist}, \quad (12)$$

where  $y_{ist}$  is the wage premium—the percentage difference between politician's and co-workers' average weekly earnings, of individual  $i$  in year  $s$  at event time  $t$ . The regression includes event time dummies, the full set of year dummies, and individual's age dummies. Individuals who worked for the same firm at least a year before and after the event are included. Since in this exercise we follow the wages of the same employees in the same firm, a jump in the wage premium right after the event can be attributed to the worker's acquisition of political power.<sup>29</sup> Figure 7 plots the  $\alpha_j$  coefficients on the event time dummies. The coefficient on  $t = -1$  is normalized to zero. We see that the wage premium increases at  $t = 0$  and  $t = 1$ , stabilizing at around 3–4% in the years after the event. This increase in the wage premium suggests that a worker becomes more valuable after acquiring political power or that the worker's outside options increase after entering politics. Interestingly, we find no evidence of a decline (nor of an increase) in a politician's wage premium after he or she loses his or her political seat but stays in the firm.

*Rent Sharing.* As the first step in understanding the bargaining process between a firm and relevant politicians, we attempt to quantify the (static) rent sharing between a firm and its politician-employees.

We estimate the joint surplus created by the firm and its politicians as the sum of the firm's profit premium and the politicians' wage premiums. To compute the monetary value of the wage premium, we take estimates from equation (12). Since wage contracts adjust gradually, we take the average percentage change in the wage premium for several years

<sup>29</sup>To condition on colleague characteristics, we also consider an exercise where we calculate the premium relative to stable co-workers from the last year, instead of all co-workers. Such exercise produces higher wage premium estimates.

after becoming a politician—0.035 percentage points. Taking the average weekly pay of (non-politician) co-workers of 747 Euros, and given that on average, firms employ 1.7 politician-workers conditional on being connected, we obtain an estimated yearly income gain of 2311 Euros for politicians in the firm.

To estimate gains in profits associated with political connections, we use estimates from the firm-level fixed effect regression of yearly profit growth on the connection dummy (Appendix Table C.II), which amounts to 2.8 percentage points. Given the average value of profits in the sample, we obtain an estimate of 9037 Euros for the static yearly profit gain for a firm. Then, our back-of-the-envelope calculation indicates that politicians' income gain accounts for 20% of the total surplus from the interaction of a firm and politicians, while the remaining 80% goes to the firm in terms of additional profits.<sup>30</sup>

The estimated rent attributed to politicians is likely a lower bound for several reasons. First, the above event study estimates the wage gain from a *change* in the worker's wage premium after becoming a politician. However, if firms anticipate the political careers of their employees, part of the political wage premium is already embedded in the wages of employees before they are elected to office. Second, if after becoming politicians, employees reduce their work hours in the firms, in the absence of data on exact hours, we underestimate the true change in wage premium. Finally, we do not capture other non-wage monetary transfers from the firm that might be relevant (Fisman, Schulz, and Vig (2014)).

**FACT 4:** *Politician-employees earn significant wage premiums relative to their co-workers. This premium implies an average 20–80% rent sharing between the politicians and the firm, respectively.*

## 6. AGGREGATE OUTCOMES

Our analysis concludes with a treatment of the aggregate outcomes of political connections. We first provide evidence that political connections are linked to negative aggregate dynamics, then discuss bureaucratic and regulatory channels, and show back-of-the-envelope calculations that roughly quantify the static gains and dynamic losses of having political connections in the Italian economy.

### 6.1. Firm-Level Political Connections and Business Dynamism

We now turn to the aggregate implications of political connections. As highlighted by our theory, if political connections slow down competition, markets with connected firms should face lower firm entry and reallocation, be dominated by larger and older firms, and, as a result, have lower productivity and growth. In this section, we provide supporting evidence at the levels of industries and regions for this conjecture.

We explore whether markets with more political connections exhibit lower business dynamism. We define a market at the industry  $\times$  region  $\times$  year level, and for each market, we compute the share of connected firms and various metrics of business dynamism: the firm-entry rate, total employment growth, market-level labor productivity, the share of young firms, and the share of small firms.<sup>31</sup> Table X shows the results from regressing

<sup>30</sup>The same rent-sharing calculations at the median levels of wages and profit allocate 56% of total rents to politicians.

<sup>31</sup>To avoid mechanical dependence, we use the share of connected incumbents as the explanatory variable for the entry regressions.

TABLE X  
POLITICAL CONNECTIONS AND INDUSTRY DYNAMICS.

	(1) Growth empl	(2) Log LP	(3) Share young	(4) Share small	(5) Entry rate	(6) Share conn. entry
Share of connected firms	-0.0980 (0.0332)	-1.243 (0.156)	-0.290 (0.0209)	-0.992 (0.0333)	-0.0309 (0.0108)	0.234 (0.0262)
Observations	34,214	33,569	36,049	36,049	35,857	30,411

*Note:* Table reports coefficients from OLS regressions of various outcomes at the market level (industry  $\times$  region  $\times$  year) on the share of connected firms (share of connected incumbents in the case of columns 5 and 6). Columns list various outcome variables: (1) market-level employment growth; (2) market-level labor productivity (total value added over total employment); (3) share of firms younger than 5 years; (4) share of small firms (<5 workers); (5) entry rate of new firms; and (6) share of connected firms among entrants. All regressions include year, region, and industry fixed effects. Regressions are weighted by the number of firms in each industry  $\times$  region  $\times$  year to weight more representative markets more heavily. Standard errors are in parentheses.

market-level variables of business dynamism on the share of connected firms, conditional on region, industry, and year fixed effects.

We find that more politically connected markets have lower entry of new firms and slower aggregate growth. In addition, these markets are less productive, have fewer young firms, and are dominated by large firms—all clear signals of reduced creative destruction. Interestingly, conditional on entry, in those markets that are more populated by connected firms, new firms tend to start off with connections, as evidenced by the last column of the table. In connected markets, in order to compete with incumbents, entrants might need to seek protection before entering the market. However, we cannot exclude that other time-variant factors at the market level that lead incumbents to resort to political connections could also make entrants do the same.

Even if these relationships cannot be interpreted as being causal, our results show a strong and negative correlation between connections and business dynamism in Italy, in line with aggregate implications from the model. We summarize our results in the following stylized facts:

**FACT 5:** *More connected markets face lower firm entry, and conditional on entry, entrants are more likely to be connected than in other industries.*

**FACT 6:** *Markets with a higher share of politically connected firms have a lower share of young firms and exhibit lower employment growth and productivity.*

In Appendix C of the Supplemental Material, we explore the industry heterogeneity of these results and study cross-border spillover effects. First, local political connections could be particularly valuable for firms serving local markets and the ones exposed less to international trade. Indeed, we find that the negative relationship between political connections in the market and the market's business dynamism is pronounced in non-tradable sectors with a lower share of exports in their sales as well as in non-manufacturing sectors. Second, one may wonder if the high presence of political connections in local markets reallocates business activities across borders. We find weak evidence for cross-border spillovers, suggesting that in the aggregate, a decline in entry at the local level is not fully offset by the reallocation of entry elsewhere.

## 6.2. Bureaucratic and Regulatory Burden

We provide empirical support for the importance of bureaucratic and regulatory frictions for political connections. The details of the analysis are delegated to Appendix D of the Supplemental Material.

Following Pellegrino and Zingales (2017), we start by building an industry-level *Bureaucracy Index* that measures the regulatory and bureaucratic burden faced by firms, based on the texts of newspaper articles. This index is simply the share of newspaper articles about an industry that have certain keywords that are related to bureaucracy/regulation (e.g., “regulation,” “bureaucracy,” “paperwork,” “red tape,” and “license”). Consistent with an idea that firms rely on political connections to smooth out bureaucratic and regulatory frictions, we see that in industries with a higher Bureaucracy Index, firms rely more on political connections.<sup>32</sup>

Next, we combine this index with the data on institutional quality across Italian regions (Nifo and Vecchione (2015)) to get closer to measuring local business environment and to identify those industries in regions where firms would potentially gain most from local political connections. We show that the negative relationship between political connections and business dynamism is particularly strong in heavily regulated industries and regions with poor institutional quality. This supports the idea that bureaucracy and regulations are important channels through which political connections transmit into worse aggregate business dynamics.

We find no support for the alternative channel according to which firms rely on political connections to secure higher demand from the government (Cingano and Pinotti (2013)). Using the sectoral input-output table for Italy, we construct the standard *Government Dependence Index* that measures the share of an industry’s output that is demanded by public sector. In our data, there is no significant correlation between connection intensity of the industry and the measures of industry’s government dependence.

## 6.3. Back-of-the-Envelope Calculations From the Model

This section further quantifies the importance of bureaucratic frictions and provides back-of-the-envelope estimates of the static gains and dynamic losses from the presence of political connections in Italy. Appendix E of the Supplemental Material discusses model calibration and the details of the calculations. Here, we briefly summarize the results.

First, we calculate the implied bureaucratic and regulatory wedge  $\tau$ . In the model, the firm’s connection with a politician alleviates the wedge, creating a profit gain for the firm and a wage gain for the politician. Hence, rent estimates from Section 5.4 can be used to pin down the implied wedge  $\tau$ . The wedge is estimated to be equivalent to 0.9%–3.8% tax rate on labor, implying the yearly total cost of wedges ranging from 0.18% to 0.71% of GDP. Relative to the counterfactual economy with no wedges, the existence of these wedges reduces aggregate output by 4%.

To put  $\tau$  estimates in perspective, we first compare them to Garicano, Lelarge, and Van Reenen (2016) who estimated a corresponding labor wedge of 2.3% and 5.9% caused by labor regulations in France. Although Garicano, Lelarge, and Van Reenen (2016) found twice larger tax rates, in their case, the regulatory wedges kick in only for the firms above 50 employees; hence, the average wedge applied to all firms is lower. Second, it is important to note that the magnitude of wedges we identify is a lower bound on the aggregate

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<sup>32</sup>This result is also consistent with Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002) who showed that countries with heavier entry regulations have higher corruption.

amount of regulatory and bureaucratic costs in the Italian economy. In the model, a firm with political connections faces zero wedges. Hence, we should interpret the implied  $\tau$  as that part of the regulatory and bureaucratic costs that connections with local politicians can alleviate.

Finally, we calculate static gains and dynamic costs from the existence of political connections in our model. We estimate that statically, relative to the economy with wedges and no political connections, the observed level of connections in Italy creates a 1.2% gain in output. Hence, static gain from removing wedges recovers 30% of output loss from wedges. However, dynamic losses from political connections through lower creative destruction and growth outweigh the static benefits, reducing the present value of aggregate output by 3%. Hence, on net, political connections reduce the present value of output by 1.8%. Therefore, our calculations show that the presence of political connections is likely to exacerbate the economic losses already created by the burden of bureaucracy and regulations.

## 7. CONCLUSION

In this paper, we studied the link between political connections and firm dynamics, theoretically and empirically, with Italy as our example. Our brand-new data, matching multiple administrative data sets together for the first time, enabled us to uncover new findings at the micro and macro levels. In turn, the model generalized our empirical facts by suggesting that structural features of the economy drive them. We show that in an environment with high market frictions such as regulatory barriers or bureaucratic burden, where a firm's route to success often runs through the political system, political connections by market leaders may impede growth by lowering innovation and reallocation. Hence, while political connections may create static benefits for connected firms, they may also imply high dynamic social costs. Future work should incorporate these static benefits and dynamic costs to assess the quantitative importance of political influence for declining business dynamism in the United States and Europe, where market concentration has increased, and lobbying spending has grown to record levels.

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