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# Civic Capital and Service Outsourcing: Evidence from Italy

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## Abstract

This paper studies whether civic capital is an effective restraint against opportunistic behaviour in business-to-business transactions by looking at the firm-level degree of service outsourcing in Italy. Our results show that firms tend to outsource more services in areas where civic capital is higher. We claim that the rise in the propensity to engage in transactions with outside service suppliers stems from the decrease in opportunism between the parties involved.

**JEL Classification:** A13, L20, L24, R12

**Keywords:** Civic Capital; Purchased Service Intensity; Vertical Integration; Outsourcing.

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# 1 Introduction

Understanding the determinants of firm boundaries is a fundamental concern in economics. Starting with Coase (1937) and Williamson (1975, 1979), important theoretical contributions have highlighted the role of incomplete contracts and transaction costs for the firms' decision of whether to produce a given input in-house or to purchase it from external suppliers. When contracts are not fully enforceable by third parties and unforeseen contingencies occur, agents have an incentive to behave opportunistically on initial agreements, thus reducing the efficacy of written agreements and creating contracting costs. Between in-house production and external sourcing, firms are expected to choose the form of production that minimizes costs, taking duly into account transaction costs.

At the same time, a well developed literature documents that civic capital or societal trust have far reaching implications for economic outcomes in general (Putnam, 1993; Guiso et al., 2011; Algan and Cahuc, 2014; Tabellini, 2010) and the behaviour of firms in particular (Bloom et al., 2012). The key merit of the underlying values and beliefs that account for the stock of civic capital is that they attenuate narrow-minded self interested behaviour. The propensity of individuals to engage in opportunistic behaviour is thus lower in areas where civic values are more widespread.

In this paper, we combine the key insights from these two strands of literature and test empirically whether civic capital alters the boundaries of the firm: if the degree of opportunism decreases with the stock of civic capital, we expect the incidence of contractual hazards to be lower in more civic areas. As a consequence, the firm organization of production should vary with the stock of civic capital characterizing the area where it is located. More precisely, according to the transaction cost literature (Williamson, 1975, 1985), contractual hazards are more easily dealt with in integrated production processes. Consequently, others things equal, we should observe less outsourcing in areas where civic capital is low (as the propensity to behave opportunistically is higher) and more outsourcing where civic values are widespread.

Employing a large Italian firm-level data set, we investigate the relationship between the firms' degree of service outsourcing and the stock of civic capital in the province where the firms are located. The choice of using services rather than raw material inputs is dictated by several reasons. First, the transactions involving service purchases are particularly sensitive to contractual incompleteness, because they tend to be afflicted by measurement and hold-up problems, and are

often plagued by asymmetric information. This makes them a suitable input to look at for our purposes. Second, services are predominantly purchased in the local market (Schwartz, 1993; Ono, 2003; Merino and Rodrand, 2007). This makes the effect of local civic capital on service outsourcing more straightforward to identify, as both the buyer and the provider tend to be located in the same area, and hence they operate surrounded by the same level of civicness.

We show that the stock of civic capital in a given province influences firm-level intensity to purchase services from external providers. In particular, we find that firms located in provinces endowed with more civic capital outsource more services. The results are robust against the inclusion of relevant firm-level and provincial controls. Our empirical strategy needs to confront concerns related to the proxies for civic capital used in the study. On the one hand, the relationship between civic capital and firm outsourcing could be flawed by unobserved heterogeneity on various dimensions. Structural, geographical and institutional drivers of firms' decisions may be correlated with civicness by reason of underlying channels not captured by our model specification, leading to endogeneity. On the other hand, civic capital indicators might be plagued by measurement error or may fail to capture the relevant facets of civic capital affecting outsourcing decisions the most, this potentially inducing attenuation bias in the OLS estimator. The econometric identification in our paper is strengthened in two ways: the exploitation of industry heterogeneity in the impact of civic capital on service outsourcing, and the use of instrumental variables. Looking at the magnitudes when we account for industry heterogeneity, we get that, if Naples had the same stock of civic capital of Milan, the surge in average service outsourcing could span from 17% (in an industry where the adjustment scope in service outsourcing is limited) to 35% (where it is easier to fine-tune service outsourcing).

The fact that civic capital increases service outsourcing is consistent with the conjecture that societal values and beliefs reduce the propensity of the parties involved in a transaction to defect. In this way, our analysis confirms Williamson's hypothesis that "societal culture" can improve the efficacy of contracts by reducing opportunism (Williamson, 1993). Our paper contributes to the literature analyzing the institutional determinants of vertical integration. We find a direct and positive effect of the institutional setting on outsourcing: civic capital shapes firms' organization of production even after controlling for key aspects of institutional quality, such as the efficiency of the judiciary and the level of financial development. This result complements the findings of Acemoglu et al. (2009), who show that the relationship between contracting costs and the firms'

decision to vertically integrate is knotty. Acemoglu et al. (2009) find that the quality of contracting institutions has no direct effect on the degree of vertical integration. However, contracting institutions matter once industry heterogeneity is taken into account, since the efficiency of the judiciary brings more vertical integration in industries that are more capital-intensive. They also find greater vertical integration in countries that have both greater contracting costs and greater financial development. In a recent paper, Boehm and Oberfield (2020) document that, in industries that rely more heavily on relationship-specific intermediates, plants in Indian states with more congested courts have a greater vertical span of production. We stress that, while these papers focus on the role of formal institutions, in our paper we investigate the role of an informal institution such as civic capital. Another novelty of our approach is the analysis of the sourcing decision of a specific input such as services.

Next, our paper is also related to the literature looking at the determinants of service outsourcing. Several factors that influence the propensity of firms to purchase services from external providers have been identified, ranging from labor cost savings (Abraham and Taylor, 1996), ICT investment (Abramovsky and Griffith, 2006), firm size (Abraham and Taylor, 1996; Merino and Rodrand, 2007), demand fluctuations (Abraham and Taylor, 1996), market share (Galdon-Sanchez et al., 2015) to the characteristics of the local market, in particular its size (Ono, 2007). None of these studies however focuses on how cultural traits, such as those embedded in civicness, affects service outsourcing.

Finally, our results complement the findings of Bloom et al. (2012) and Bürker and Minerva (2014), on the relationship between trust and civic capital and the size (measured in terms of employees) of private organizations, where civic capital is found to have a positive effect on the average size of private organizations.

The remainder of the paper is organized as follows. The next section provides the conceptual framework and derives some testable implications. Section 3 describes the data and the variables employed. In section 4 we lay out the estimation strategy, while sections 5 and 6 are devoted to the description of results, respectively, of the OLS estimates and of the instrumental variable estimates. Section 7 draws some conclusions.

## 2 Conceptual framework

### 2.1 Opportunism and service outsourcing

For most economic transactions, it is virtually impossible to set up written agreements that specify contingencies for all possible future states. Rather, contracts are often incomplete and their enforceability by third parties is limited, something which gives the contracting parties an opportunity to renege on initial agreements and, as a consequence, undermines the efficacy of contracts. The fact that incomplete contracts involve contractual hazards ex-post is a direct consequence of opportunistic behaviour on the part of the agents involved in the transaction. More generally, the transaction cost literature (Williamson, 1975, 1985) states that opportunism is a necessary condition for the emergence of contractual hazards. If opportunistic behaviour, defined as “self-interest seeking with guile” (Williamson, 1996), were absent the efficacy of contracts would be guaranteed even if the underlying agreement was not enforceable by third parties. In such a setting, it would be sufficient to specify automatic adaptation clauses that apply when the conditions require an update of the written agreement. In this sense, high civic capital (and absence of opportunism) can be thought to be a substitute for good contracting institutions. The transaction cost literature is vaguer on intrafirm factors limiting vertical integration within firm boundaries than on factors affecting arm’s-length transacting. The literature generally invokes the presence of “governance costs” that limit firm boundaries. Firms that produce a wider range of inputs might face larger governance costs associated with running a less specialized organization. As far as arm’s-length transaction costs are more sensitive to opportunism than intrafirm governance costs, we expect that the rise in opportunism tilts towards in-house production of services.

In this study, we consider a specific case of how variations in opportunistic behaviour shape the efficacy of contracts. We analyze how the firm decision to outsource or not services varies with the degree of opportunistic behaviour characterizing the environment in which the transaction takes place. Studying the sourcing decision of services, rather than material inputs, has two advantages. First, we argue that the incidence of contract incompleteness is particularly strong in service transactions. As services are intangible and often non-standardized, the responsibilities and duties for each contracting party are hard to define and penalties for defection difficult to specify. Moreover, service transactions are likely to be afflicted by hold-up problems if the provider has to acquire specific physical or human capital to meet the needs of the client. Similarly, it might

be that the client has to align its work setting in order to allow the provision of the service or to assist effectively the provider (DeBandt, 1996). Contractual frictions further increase due to measurement difficulties. As services lack well-defined technical standards it is generally difficult to measure quality or simply to compare it across different suppliers. Therefore, it is cumbersome to write a contract that specifies ex-ante clauses for each possible contingency that might emerge during the course of the contractual relationship. Rather, the contract that governs a service transaction is likely to be incomplete and requires ex-post adaptation to unforeseen contingencies.

The second advantage of studying transactions involving services resides in their limited tradability. This is an important aspect, as our variable of interest is civic capital, an inverse measure of the opportunistic attitude that characterizes the environment in which a transaction takes place. Hence, the effect is accurately identified when both transacting partners are located in the same area. In the case of service transactions this condition is likely to be fulfilled. The degree of spatial proximity between clients and providers is high for services such as repairing and maintenance, cleaning, or security that require repeated personal interaction between the client and the provider (DeBandt, 1996). According to the Survey of Industrial and Service firms, conducted by the Bank of Italy in 2007, 2/3 of Italian firms purchase services exclusively from providers that are located in the same region. Even if we work with a smaller geographic partition (on average there are 5 provinces per region) this evidence confirms that service tradability is limited. Moreover, even when the headquarters of the service provider are located far from the client, the workers directly involved in the provision of the service have to reside close to the buyer.<sup>1</sup> Differently from services, raw materials are more tradable, and hence the supplier's location can be far away from the buyer's. The assignment of an appropriate level of opportunism is puzzling in the case of raw materials transactions, and hence they constitute a less suitable object of analysis.

## 2.2 The role of civic capital

We associate the degree of opportunism in a given area to the stock of civic capital in the province where the firm is located. There are good reasons to believe that civic capital is a good proxy for the behavioural traits that inform about opportunistic behaviour in economic transactions. Civic

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<sup>1</sup>For example, think to cleaning workers employed by a large service firm. The headquarters of the service firm may be located everywhere in Italy, but the workers directly hired to perform the daily cleaning operations should reside close to buyer.

capital is defined as “those persistent shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities” (Guiso et al., 2011). Put differently, it captures all those societal values and beliefs that mitigate the free-rider problem, a genuine form of opportunistic behaviour. Therefore, we conjecture that the stock of civic capital increases the efficacy of contracts as agents have a lower probability to defect. The concept of civic capital comes close to what Williamson terms “societal culture”. He emphasizes that societal culture increases the efficacy of contracts, and hence shapes the organization of production, as it limits the incidence of opportunistic behaviour (Williamson, 1996).<sup>2</sup>

What are the implications of the reduction in contracting costs brought about by civic capital for the intensity of service outsourcing? Transaction costs economics posits that if contractual hazards are acute provision is more efficiently achieved within firms, as its hierarchical structure is better able to solve disputes that may arise during the course of production. On the other hand, if contractual difficulties are small a product is efficiently provided by an independent supplier and then exchanged through a market transaction. The empirical literature has confirmed this prediction. Products that are complex and afflicted by hold-up are produced by integrated firms (Lafontaine and Slade, 2007).

The picture could be broadened by asking how the intensity in service purchases relates to firm productivity and size. With this objective in mind, in appendix A.1 we present a three-input variant of Hsieh and Klenow (2009) where we derive an expression for firm-level Purchased Service Intensity (PSI hereafter) as a function of two types of distortions, one on output and one on service purchases. We show that, under the assumption that civic capital lowers distortions, firm-level PSI increases, as well as the use of factors of production, including the number of employees.<sup>3</sup>

Based on all these insights, we aim at testing the following hypothesis: firms located in areas with low endowments of civic capital acquire less services from external suppliers (smaller PSI). In these locations, opportunism is pervasive, and firms tend to rely more on the internalization of

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<sup>2</sup>The literature on relational contracts has found that they also affect the firms’ integration decision (Baker et al., 2002). Relational contracts are sustained by the value of future relationships; that is, agents have an interest not to renege on contractual agreements even if they are not enforceable by third parties. The behavioural traits underlying civic capital might operate making relational contracts more sustainable.

<sup>3</sup>The stylized model helps reconciling the findings in Bürker and Minerva (2014), where civic capital is found to have a positive impact on size, with the findings of this paper, where civic capital is found to have a positive impact on service outsourcing. Under the assumptions of the model, firm-level TFP does not correlate with PSI, while it positively correlates with the quantity of inputs (capital, labour, services) used.

service provision. Conversely, where civic capital abounds transaction costs are lower, as agents have a lower propensity to renege on initial agreements and behave opportunistically. In this case, relatively more transactions concerning services are realized through arm's length relationships, so we should observe greater service outsourcing (larger PSI).

### **2.3 Endogeneity, industry heterogeneity, and the historical determinants of civic capital**

In our setting the identification of the effect of civic capital on the firms' degree of service outsourcing is potentially challenged by omitted variables and endogeneity, along with measurement error. In fact, the relationship between the endowment of civic capital and vertical integration of firms could be confounded by unobserved heterogeneity on various dimensions. Institutional, geographical and structural factors (e.g., related to the labour market or to the quality of infrastructures) not explicitly accounted for in the model specification could be driving both civic capital and firm outsourcing decisions. On a different perspective, and more closely related with the quality of the proxies available for civic capital, inconsistent estimates may also arise so far as our indicators are plagued by measurement error or fail to capture the most relevant aspects of civiness truly affecting outsourcing decisions: in fact, this would potentially induce attenuation bias in the OLS estimator. Moreover, there might be concerns about a reverse causal relationship, going from local economic development to higher levels of civiness and service outsourcing. Imagine a thriving province characterized by the presence of many service providers. In such a favourable business environment, firms may have a higher tendency to purchase services from external suppliers. If economic prosperity fosters civic behaviour as well, we may observe a positive association between civic capital and PSI that does not necessarily reflect a true causal relationship.

In the empirical analysis we adopt two approaches to deal with these issues. Under the first approach, we rely on industry heterogeneity in the impact of civic capital, based on the industry *coefficient of variation* of PSI. Within our conceptual framework, we should expect that firms operating in industries where the degree of service outsourcing is more similar are less affected by the level of civic capital than firms in industries with a more heterogeneous degree of service outsourcing. We account for this mechanism by including the interaction of civic capital with the industry coefficient of variation of PSI as a proxy for the degree of standardization of firm choices at the industry level. The coefficient of variation is a normalized measure of industry



dispersion supposed to capture the adjustment scope in the use of external services faced by firms in a given industry. In industries where PSI is volatile (large coefficient of variation), firms have more room to choose their optimal level of PSI, i.e. they are able to fine-tune the purchase of services from external suppliers, after weighing costs and benefits. In contrast, a low value for the industry coefficient of variation suggests that the individual firm range of choice about how much to outsource services is limited, so firms tend to have similar values of PSI.

This strategy allows to include provincial fixed effects that absorb unobserved heterogeneity at the same spatial scale at which we compute civic capital. Differences in the degree of local economic development, that may originate from heterogeneity in the quality of infrastructures and geographical features, among others, are thus accounted for, this also mitigating the concerns about potential reverse causality. By doing so, we rely for identification on the degree of dispersion in outsourcing decisions for different industries within the same province.

The literature has so far used the Rauch (1999) measure of relationship-specificity to identify the role of contractual frictions on the degree of vertical integration, the most recent application being Boehm and Oberfield (2020).<sup>4</sup> In our case, the inclusion of the Rauch variable is not viable, because it ranks different traded input commodities in terms of contractual intensity, while in our analysis we focus on services, which are a single type of input, invariably characterized by strong relationship-specificity. For this reason we adopt the new measure described above.

Under the second approach, following a large literature aimed at establishing a causal relationship between civic capital and socio-economic outcomes (de Blasio and Nuzzo, 2010; Tabellini, 2010; Guiso et al., 2016), we use an instrumental variable strategy that exploits information on past institutional, political and cultural settings, dating back even to several centuries ago, in order to get an exogenous source of variation for the current level of civic capital. The approach grounds on the high *persistence* of informal institutions and cultural factors (e.g., trust and propensity towards cooperation) in local communities. Such enduring, long-run effects ensure that past institutional quality exerts a withstanding influence on current social interactions. The choice of the historical instruments and the validity of the exclusion restrictions are extensively discussed in a dedicated section.

Lastly, a potential issue in our empirical strategy could be spatial sorting: firms relying more

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<sup>4</sup>Casaburi and Minerva (2011) employ the Rauch measure to study customization (production to order) or standardization (production in advance) of intermediate inputs according to downstream spatial clustering of buyers.

on external providers might locate in areas where the market for those services is thicker and where institutions are more favourable. With respect to this we have two considerations to make. First, the concern is mitigated as long as firms' spatial sorting is based on characteristics properly observed and included in the empirical analysis. Second, in appendix A.2 we provide evidence that spatial sorting is not of practical concern. We do not find that firms tend to be more or less concentrated across provinces in relation to some key observable industry characteristics.

### 3 Data and variables

#### 3.1 Firm-level variables

The primary source of information is AIDA, a firm-level dataset administered by the Bureau van Dijk, which provides information on balance sheets and profit and loss statements for hundreds of thousands of Italian businesses. Our dataset covers the years from 2001 to 2007.<sup>5</sup> We extract information on a number of variables including sales, the number of workers, total tangible fixed assets, service purchases, firm age. We also retain information about firms' geographic localization and industry. An important advantage of the AIDA dataset is that it includes all industries.<sup>6</sup> The sample turns out to be highly representative of the actual population of businesses in Italy in terms of the geographical distribution of firms.<sup>7</sup>

We are not the first to employ firm-level data to investigate the determinants of outsourcing,<sup>8</sup> but there could be a concern that analyzing service outsourcing with information collected at the firm-level rather than at the plant-level might be inaccurate if a firm runs multiple establishments. However, to the extent that decisions on service outsourcing are taken at the central firm headquarters, and are not decentralized to individual plants, there is no error due to firm-level aggregation. Under centralization, the degree of outsourcing of all the plants belonging to a given firm will be

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<sup>5</sup>Data were accessed from the repository of the Library of the Department of Statistics of the University of Bologna. For each year, the dataset includes all the firms for which the information was available.

<sup>6</sup>The only industries that we exclude from the analysis are: Public administration (NACE rev. 1.1. code 75), Education (80), Health and social services (85), Unions, political parties and other organizations (91), Private households (95, 96, 97) and Extraterritorial organizations (99).

<sup>7</sup>The pairwise correlation between the number of firms at the provincial level in our sample and the number of firms from official business statistics is equal to 0.93.

<sup>8</sup>See Merino and Rodrand (2007) on service outsourcing of Spanish firms, and Li and Lu (2009) on input outsourcing in China.

decided by the managers located at the central office and, according to our framework, it will be affected by the level of civic capital of the central office's province. Moreover, if sourcing decisions are made at individual plants the use of firm-level data is still adequate as long as plants and headquarters are located in the same province, since the different units are influenced by the same level of provincial civic spirit. The only case where firm-level data are potentially problematic is when the decision to outsource services is decentralized at the plant level and plants are located outside of the province of the firm headquarters.<sup>9</sup>

The degree of service outsourcing at the firm-level is measured as follows. The item dedicated to services in the profit and loss statement informs about the total expenditures paid by the firm for external service provision.<sup>10</sup> Since items recorded in the income statement are collected for accounting purposes, the purchase of specific services is not singled out, and we have only information on the total amount of purchased services. Service purchases are then divided by the total amount of sales in order to retrieve a measure of service outsourcing, that we call Purchased Service Intensity (PSI hereafter). This measure of service outsourcing has been employed before in the literature (Abramovsky and Griffith, 2006; Görg and Hanley, 2011). Since AIDA collects publicly available balance sheet information, the reliability of the data is high. Still, one may wonder about the occurrence of systematic under-reporting in balance sheet items that could bias our results. If anything, under-reporting would go against our results for the following reason. If we assume that firms aim at minimizing the tax burden, we can expect that they under-report revenues and over-report service expenditures to reduce declared profits. As long as the prevalence of tax fraud is higher in areas with lower civic capital, we expect PSI calculated from balance sheet items to be systematically higher in areas with less civic capital. This would bias downward our estimates, against our expectation of a positive and statistically significant association between PSI and provincial civic capital.

After removing outliers and observations with abnormal values, we end up with a sample of firms spanning the years 2001-2007.<sup>11</sup> As the main regressor of interest, i.e. the proxy for civicness,

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<sup>9</sup>Given the small average size of businesses in Italy, this problem cannot be solved by using the size of firms to discriminate between firms with plants in a single province and firms with plants in two or more provinces. Even picking relatively small size thresholds such as 15 or 20 employees, we would be still including a large share of firms with plants in two or three different provinces.

<sup>10</sup>In Appendix A we give a detailed description of the kind of services that enter this item.

<sup>11</sup>Observations with negative values for variables such as service purchases, sales, employees, fixed assets, age are excluded. Moreover, we drop observations whose value of PSI is larger than the 99.5th percentile of the PSI

is time-invariant, along with some additional provincial controls, and some covariates display a limited within-firm variability, the identifying variation is cross-sectional rather than over time. We therefore average the variables included in the model specification over the years 2001-2007 and estimate the model on time-averaged data at the firm level. Table 1 reports the descriptive statistics. On average, the amount of purchased services equals 18.7 percentage points of firm sales, while the median value of PSI is slightly larger (20.7 percentage points). Figure 1 shows average PSI across provinces. Overall, the pattern suggests that there is substantial geographic variation in business service outsourcing. Firms located in Northern Italy outsource more services than businesses in the South of the country. If we look at the four largest metropolitan areas of the country (Rome, Milan, Naples and Turin) average PSI of firms in the provinces of Rome (18.9 percentage points), Milan (23.4 percentage points), and Turin (21.1 percentage points) is higher than the nationwide average. This is in line with Ono (2007) who finds that agglomeration economies favor service outsourcing of firms. An interesting exception in this regard is the province of Naples. The average PSI of firms located in this province equals 12.6 percentage points, which is a value substantially lower than in other agglomerated areas and in Italy as a whole. This is surprising, as the province is the third largest of the country in terms of population and has the highest population density. At the same time, this evidence is supportive of our idea that low levels of civicness may hinder service outsourcing, since the province of Naples has the lowest endowment of civic capital in Italy according to our measures.

[Insert Figure 1 about here]

Figure 2a shows that the geographic pattern of PSI represented in Figure 1 is not driven by the spatial sorting of industries with higher average PSI in the Center-North: even after removing the variation in PSI that is explained by industry affiliation, service outsourcing is still higher in the North of the country.<sup>12</sup> The North-South gradient in average firm-level PSI vanishes when we add dummy variables for geographic partitions. In figure 2b we add five dummies for each macro-region in Italy (North-West, North-East, Center, South, and Islands), while in figure 2c we add twenty dummies for each region in Italy. In the econometric analysis we always use one of these two sets of geographic fixed effects, and this makes us confident that our results are not driven by spurious distribution.

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<sup>12</sup>Specifically, Figure 2a shows average provincial residuals obtained from regressing the log of PSI on the full set of 3-digit industry dummies.

spatial correlation between our dependent variable and the civic capital proxies (a point stressed by Kelly, 2019).

[Insert Figure 2 about here]

In section 4.1 we describe our approach to study whether the impact of civic capital on PSI is sensitive to industry characteristics. In order to reduce endogeneity concerns, we also use the French database *Fichier Bancaire des Entreprises* (FIBEN) to calculate measures of industry heterogeneity. Based on tax statements, FIBEN contains detailed information on balance sheets and profits and loss accounts of French firms whose annual sales exceed 750,000 Euros. The database is administered by the *Banque de France* and includes roughly 300,000 firms per year. We keep years from 2003 to 2007 to work with a native industry classification which is perfectly consistent with the NACE rev. 1.1 employed throughout the analysis, thus avoiding the use of concordance tables which always entails some degree of arbitrariness.

### 3.2 Measurement of civic capital

We quantify the stock of civic capital in a given province by three proxies, namely electoral turnout in referenda, blood donations in 2000, and volunteering in non-profit organizations in 2002, with the latter two variables being standardized by population.<sup>13</sup> These variables are standard measures for civic capital in the literature (Guiso et al., 2004; Buonanno et al., 2009; de Blasio and Nuzzo, 2010). The motivation to use them as proxies descends from the following reasoning. Individuals that donate blood, vote in referenda, or volunteer in non-profit organizations make an effort without receiving any personal or pecuniary compensation. Individuals who pursue these activities deviate from narrow-minded self-interested behaviour and express a concern for the common good. Therefore, these activities can be considered as an expression of those societal values and beliefs prevailing in the local area that sustain cooperation. This is precisely the behavioural trait civic capital aims to capture. The incidence of these activities at the local level informs about the strength of cooperative values and beliefs in a given province. Obviously, each of these proxies is only an imperfect measure of civic capital. In order to purge these proxies of noise, we extract the first principal component. As expected, we find a strong common pattern in the data. All three proxies are highly correlated and the first principal component explains 75% of the total variance.

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<sup>13</sup>A complete description of the variables is provided in the appendix.

The eigenvalue of the first principal component is 2.25, while the associated eigenvectors are 0.593 for referendum turnout, 0.581 for volunteers, and 0.558 for blood donations.<sup>14</sup>

Figure 3 shows the geographic variation of civic capital across Italian provinces when measured by the first principal component. The map confirms the well-established North-South divide in the endowment of civic capital. Provinces in the Centre-North have a high stock of civic capital whereas the endowment of civic capital in the South is considerably lower. Comparing the geographic distribution of civic capital with average provincial PSI, net of industry effects, in Figure 2a reveals striking similarities. The sharp North-South gap in the endowment of civic capital resembles the spatial pattern of PSI. Moreover, the Central-Northern regions where the stock of civic capital is the largest are those with the highest PSI. The analogy between the two maps provides strong visual evidence of a positive relationship between civic capital and the extent of service outsourcing.

In section 6 we use historical variables of civic capital as instruments. The first measure is average electoral turnout in elections during the period 1919-1921. The second historical measure is membership in mutual aid societies in 1873, standardized by population. Both variables are available at the regional level.<sup>15</sup> The last historical instrument delves even deeper into history. According to Putnam (1993), the differences in civic capital across Italy were determined by different political regimes prevailing at the beginning of the second millennium. In particular, he stresses the role of free-city states that emerged in the Northern part of the country for the accumulation of civic capital. Based on information provided in Guiso et al. (2008), we count for each province the number of cities that were recorded free-city states in the year 1300.

### 3.3 Control variables

We use control variables that capture relevant characteristics of the firm as well as local attributes of the province where the firm is located. Firm-level controls are age, capital stock (total tangible fixed assets) and the number of employees. The two factors of production are important controls, as they tend to influence firm-level demand in services. For example, the larger the stock of machinery, the greater the expenditure for services like repair and maintenance. At the same time, the stocks of labor and capital are proxy for the the existence of economies of scale in internal

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<sup>14</sup>The value of squared eigenvectors has the meaning of the contribution of a variable into a principal component: the closer it is to one, the higher it is the contribution.

<sup>15</sup>For a detailed description consult Putnam (1993).

service provision (Abraham and Taylor, 1996). Larger firms realize economies of scale in in-house production of services which make service outsourcing less attractive.

At the local level, the first control that we employ is the geographic concentration of service suppliers in each province, based on the number of upstream service workers. The decision of the firm to outsource a given input depends on the search costs for finding the appropriate supplier (Grossman and Helpman, 2002). This is particularly important in the case of services which are typically less standardized and require a high level of customization. Greater local availability of service providers reduces search costs and improves the match between the client and the supplier. Moreover, the thickness of the local upstream service market controls for the effect of agglomeration on contractual hazards. In a buyer-supplier relationship, the threat of holding-up the contract partner is less severe in agglomerated areas, due to the high number of potential alternative buyers (Helsley and Strange, 2007). Hence, we may expect a positive relationship between the size of the upstream local service market and PSI. On the other side, the availability of many specialized workers in the upstream service sector may increase competition in service provision, and through this channel it may lead to cheaper service inputs and to lower PSI.<sup>16</sup> We build a measure of provincial upstream service employment for each two-digit downstream industry in each year calculated as a weighted sum of service workers employed in each two-digit upstream service industry in each province, where weights are given by the corresponding Input-Output shares retrieved from the UK 2001 Use tables.<sup>17</sup>

Next, we account for the quality of formal contracting institutions, which is an important determinant of contracting costs. We measure it at the local level by the average number of days it takes for a civil proceeding to be completed in the tribunals located in the province.<sup>18</sup> Consequently, service outsourcing should be higher in those provinces where proceedings are shorter. We also include the number of bank branches, normalized by population. As in Benfratello et al. (2008), we posit that the number of bank branches is related to the local degree of financial development. Financial development, in turn, may be correlated to PSI through a number of channels.

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<sup>16</sup>We follow Holmes (1999) and Casaburi and Minerva (2011) in using absolute employment to measure agglomeration.

<sup>17</sup>When a firm in the sample belongs to the service sector, we initially subtract the number of the firm employees from the corresponding two-digit upstream service industry.

<sup>18</sup>In some province there is more than one tribunal. We calculate the average for each province over all courts located in the province.

It could promote the birth of innovative suppliers providing specialized services, thus increasing outsourcing. By inducing firm entry and hence the degree of competition, financial development may drive smaller, non-integrated firms out of the market, thereby increasing the equilibrium level of vertical integration. Alternatively, given that larger firms are more vertically integrated, the fact that financial development increases competition could also reduce the average degree of vertical integration in an industry: more intense competition and hence lower profits reduce the growth of firms and their size (Macchiavello, 2012). As some service industries tend to be skill-intensive, another variable which can be linked to the propensity to outsource services is the number of skilled workers. This variable is measured by the share of the provincial population holding a university degree.

## 4 Econometric model

We assess the impact of civic capital on PSI by focusing on the following specification:

$$\ln PSI_{i,j,s} = \alpha_0 + \alpha_1 CC_j + \mathbf{X}_i' \boldsymbol{\beta} + \alpha_2 \ln S_{j,s} + \mathbf{Z}_j' \boldsymbol{\delta} + \gamma_r + \gamma_s + \epsilon_{i,j,s}, \quad (1)$$

where  $PSI_{i,j,s}$  is the purchased service intensity of firm  $i$  in province  $j$ , 3-digit industry  $s$ ;  $CC_j$  is the variable of main interest, i.e. the stock of civic capital in province  $j$ .  $\mathbf{X}_i$  is a vector of firm-level controls, which include firm age, capital stock, and the number of employees. As for the controls at the province level,  $S_{j,s}$  is the proxy for the thickness of upstream service supply (varying by province and industry) captured by the number of upstream workers, while the vector  $\mathbf{Z}_j$  collects other provincial covariates, namely the length of trials, financial development, and the stock of human capital. Both the dependent variable and the regressors are log-transformed, with the exception of the principal component. We control for specific features at the regional level through a set of 20 regional dummy variables,  $\gamma_r$ , to minimize the impact of unobserved geographic heterogeneity on PSI. Moreover, the equation includes a full set of 3-digit industry dummies,  $\gamma_s$ , that account for systematic differences in the level of service outsourcing across industries.

We base inference on the wild cluster bootstrapping (Cameron et al., 2008) and rely on bootstrapped statistics and  $p$ -values. In our analysis, one of the proxies we use for civic capital, i.e. the first principal component, is a generated regressor which adds sampling variability to the data: the usual standard errors would overlook the induced random variation and underestimate the actual sampling variation. Moreover, our proxy for civic capital is measured at the provincial level,



thus being an aggregated regressor which is constant for all firms operating in the same province: clustering at the provincial level is therefore required. Finally, both some of the regressors and the historical instruments might be subject to measurement error. Given these data features, bootstrapping is recommended, along with clustering at the provincial level. With respect to pair cluster bootstrap, the wild cluster bootstrap has the advantage of being more robust to the inclusion of large sets of dummy variables (Cameron and Miller, 2015; Roodman et al., 2019).

#### 4.1 Industry heterogeneity

Next, we exploit heterogeneity across industries in terms of *dispersion* of firm service outsourcing to further analyze the link between PSI and civic capital. The idea is to explore whether firms in industries where the degree of service outsourcing is more similar are less affected by the level of civic capital than firms in industries with a more variable degree of service outsourcing. To do so, we calculate for each industry a measure of volatility in external service provision across firms. This measure is the coefficient of variation in PSI for firms in industry  $s$  (hereafter  $CV_s$ ), obtained by dividing for each industry the standard deviation of PSI by the industry average PSI. In order to avoid that the industry-level measure is affected by outliers in firm-level PSI, we compute two measures:  $CV_s^a$ , where we exclude firms with PSI larger than 100 percentage points;  $CV_s^b$ , where we exclude firms with PSI larger than 200 percentage points. Experimenting with other thresholds for outliers does not alter our findings. Moreover, we compute the coefficient of variation alternatively at the 2-digit or 3-digit industry level, to show that results are not dependent on the industry level of aggregation.

Table 2 shows the average coefficient of variation of PSI for some selected industries.<sup>19</sup> The table suggests that the volatility of PSI is the lowest in some service industries, such as insurance and pension funding, an activities auxiliary to financial intermediation. At the top of the table in terms of the highest coefficient of variation, we find merchandise trading activities (both retail and wholesale) and agriculture and fishing.

[Insert Table 2 about here]

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<sup>19</sup>We show the values of  $CV_s^a$ , which is obtained employing the 100 percentage points threshold for the identification of outliers. The ranking obtained employing  $CV_s^b$ , i.e. the 200 percentage points threshold to identify outliers, is strongly correlated, with a pairwise correlation of 0.92 for the position in the ranking of each industry according to the two criteria.

We then relate the industry coefficient of variation to two features of our sample. The first is the frequency of firms, plotted by deciles of  $CV_s^a$ , while the second is average firm-level PSI by deciles of  $CV_s^a$ . The graphs are shown in the following Figure 4. In terms of frequency, the 7th and 10th decile host a share of firms above 20%. Overall, the largest share of firms in the sample belongs to industries with a coefficient of variation above the median. However, the other panel shows that the average log PSI is remarkably stable across the distribution. In other terms, the average industry level of PSI is a measure unrelated to the industry coefficient of variation.

[Insert Figure 4 about here]

We also calculate the industry coefficient of variation using balance sheets of French firms recorded in the database FIBEN, in order to test the robustness of our findings. By doing so, we assume that industry characteristics that shape the dispersion of the degree of PSI in France are the same as in Italy. The ranking obtained from FIBEN correlates quite strongly with that obtained from AIDA: at the 2-digit level, the pairwise correlation coefficient among the ranking positions is 0.47.<sup>20</sup>

Ranking industries in terms of the coefficient of variation of PSI establishes a ranking also in terms of the degree of flexibility of the technology of production. This implies that the effect of civic capital should be more pronounced in industries where  $CV_s$  is high; that is, in those industries where the desired level of PSI can be adjusted more easily by the individual firm. This prediction is taken to the data by estimating the following regression:

$$\ln PSI_{i,j,s} = \alpha_0 + \alpha_1 CC_j \times CV_s + \mathbf{X}_i' \boldsymbol{\beta} + \alpha_2 \ln S_{j,s} + \alpha_3 \ln S_{j,s} \times CV_s + \gamma_j + \gamma_s + \epsilon_{i,j,s}, \quad (2)$$

where  $CV_s$ , is the coefficient of variation of PSI in industry  $s$ . In this specification, the direct effect of the coefficient of variation is absorbed by  $\gamma_s$ . Notice that we interact  $CV_s$  also with the number of upstream service workers in each province-industry. Provided that the key regressor is the interaction of the stock of provincial civic capital with  $CV_s$ , we are allowed to include 103 province fixed effects,  $\gamma_j$ , in the regression. The terms  $\gamma_j$  absorb the direct effect of the province-level variable  $CC_j$  and increase the reliability of our results as geographic heterogeneity is further washed out: unobservable province characteristics that have a direct effect on firms' PSI are wiped out by  $\gamma_j$ , but still we can estimate the parameter  $\alpha_1$ , which captures the propensity of firms to

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<sup>20</sup>The correlation coefficient is obtained employing  $CV_s^a$ ; that is, using the 100 percentage points threshold to drop outliers.

outsource services in relation to civic capital, across different industries within the same province. For what we said above, we expect  $\alpha_1 > 0$ .

## 5 Results

### 5.1 Baseline model

In Table 3 we present the OLS estimates of equation (1). As mentioned in Section 3, we collapse firm-level variables and the provincial number of service workers into averages over the 7-year time span (the remaining provincial variables including the civic capital proxies being constant across time). To identify the effect of civic capital on outsourcing, we therefore exploit the cross-sectional time-averaged variability across firms. We employ as alternative proxies of civic capital the referendum turnout alone, and the first principal component of the three measures (referendum turnout, blood donations, and volunteers). We start with a parsimonious specification, where regressors are just civic capital proxies plus industry and region dummies. The estimates suggest a positive relationship between the stock of provincial civic capital and firm-level PSI, and are statistically significant.

[Insert Table 3 about here]

In columns (3) through (6) we add incrementally firm-level controls (age, capital, and employees). In columns (7) and (8) we add upstream service workers, while in columns (9) and (10) we add a bunch of other provincial covariates. In general, results prove to be robust and coefficients show remarkable stability throughout the specifications, with the partial exception of the inclusion of the control for the number of upstream service workers. It can be argued that the number of upstream service workers is potentially endogenous in our setting, because the more firms outsource services, the more demand there is locally for service workers, and the more employment there is in equilibrium, implying reverse causality. In the analysis that follows we are going to keep the regressor, in order to adopt a conservative stance on the magnitude of the coefficient. In any case, it should be kept in mind that its inclusion may cause a selection problem, and an accurate estimate of  $\alpha_1$  lies probably between the upper bound estimates provided by columns (5) and (6), and the lower bound estimates in columns (7) and (8).<sup>21</sup>

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<sup>21</sup>The selection bias might be negative. It seems reasonable to think to provinces with low civic capital and with a

The following back-of-the-envelope calculations give an idea of the economic magnitude. An estimated coefficient equal to 0.47 when the civic capital proxy is referenda turnout implies that PSI would be 16% larger if Naples had the same stock of civic capital of Milan.<sup>22</sup> The actual differential in the average degree of service outsourcing in the data between firms located in Milan and Naples is 23.4 percentage points vs. 12.6 percentage points, which means that PSI in Milan is on average 85.7% larger than in Naples. In terms of the principal component, an estimated coefficient equal to 0.023 implies that PSI would be 11% larger if Naples had the same stock of civic capital of Milan.<sup>23</sup>

Regarding the firm-level controls, the number of employees is negatively associated with PSI, pointing to the existence of economies of scale in the production of services at the firm level. The amount of fixed assets, given the other controls, is positively related to PSI. In this case, the rise in external service expenditure relative to sales could be due to an increased demand for capital-related services (maintenance, repairing, or more sophisticated services). The sign of the coefficient of firm age is negative. As to the provincial controls added in columns (9) and (10), they are meant to capture local characteristics such as the quality of formal contracting institutions, financial development, or the stock of skilled workers. These controls turn out to be not statistically significant and we drop them in the rest of the analysis.

A recent work by Kelly (2019) has questioned the findings of a large set of contributions in the literature on persistence, studying how modern outcomes reflect characteristics of the same geographical units in past times. The evidence of strong persistence, as captured by unusually high  $t$ -statistics for the coefficients of historical variables, is deemed to be implied by a strong spatial autocorrelation showing up in the residuals, which is mistakenly overlooked in many empirical analyses. To be sure that the role of the civic capital regressors in our analysis is not overfitted by spatial correlation among provinces and following Kelly (2019), we compute the Moran's  $I$  statistic

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high number of upstream service workers to be somehow special, in the sense that firms in those provinces may have an idiosyncratic tendency for a large value of PSI. For instance, this could be the case for some large metropolitan areas in low civic capital regions.

<sup>22</sup>The log of referenda turnout for Naples is 4.146, while for Milan it is 4.458. The contribution from the difference in civic capital to the difference of PSI in log terms for the two locations is then equal to 0.147, which corresponds to roughly 16% in levels.

<sup>23</sup>The principal component for Naples is -3.347, while for Milan it is +1.236. The contribution from the difference in civic capital to the difference of PSI in log terms for the two locations is then equal to 0.105, which corresponds to roughly 11% in levels.

for each regression to test for spatial autocorrelation in the residuals averaged at the provincial level.<sup>24</sup> The Moran's  $I$  and the corresponding  $p$ -values are reported for each column of Table 3. All spatial statistics point to the absence of spatial correlation in the residuals, this supporting the evidence that pre-determined institutional setting, as proxied by civic capital, affects in a genuine manner outsourcing behaviour.

## 5.2 Industry heterogeneity

Results from the estimation of equation (2) are presented in Table 4. The different columns show all possible combinations of the interaction of the coefficient of variation  $CV_s$  and civic capital.<sup>25</sup> In each column we add the level of the number of upstream service workers and its interaction with  $CV_s$ , plus the full set of firm-level controls (age, capital, employees), and industry and *province* fixed effects. The estimate of the coefficient of the interaction term is positive and significant, and it implies that the effect of civic capital on PSI is stronger in those industries that have a larger dispersion, where firms enjoy a greater scope of adjustment in service outsourcing. The coefficients are fairly stable irrespective of whether  $CV_s$  is computed at the 2-digit or 3-digit level, so we are confident that our results are not driven by the industry level at which we aggregate firms for the computation of  $CV_s$ . The coefficients are larger when we use AIDA instead of FIBEN, and statistical significance is somehow reduced with the 3-digit coefficient of variation from French data.<sup>26</sup> Including a dummy variable for each province has an important advantage with respect to the baseline analysis, because we capture unobserved heterogeneity at the provincial level that may bias the results, and provides a good test for our conceptual framework, provided that identification comes here from the variation in firm-level PSI across industries belonging to the same province.

[Insert Table 4 about here]

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<sup>24</sup>After each regression, we average at the provincial level firm residuals and we then compute the Moran's  $I$  test for spatial autocorrelation on the 103 averaged residuals. As in Kelly (2019), the spatial weight matrix used to compute the statistics considers for each province the five nearest neighbouring provinces based on the distances between centroids, with the exception of Sardinia where the neighbouring provinces are just the other Sardinian ones; the binary spatial matrix is row standardised.

<sup>25</sup>Data are either from AIDA or from FIBEN, defined at the 2-digit or 3-digit level. In Table 4 we present result for  $CV_s^a$ , obtained considering outliers values of PSI above 100 percentage points. In the appendix we present a robustness check with  $CV_s^b$ , obtained dropping firms with PSI larger than 200 percentage points.

<sup>26</sup>Not every 3-digit AIDA industry is present in FIBEN. Because of this, we lose some 3,500 firm-level observations in the regressions where we employ  $CV^{fib}$  3-d.

Let us now turn to the economic magnitude implied by our estimates. Taking as a reference an estimate of  $\alpha_1$  equal to 0.07 when we interact  $CV_s$  with the principal component, the average PSI of firms that operate in Naples in an industry with limited adjustment scope and  $CV_s$  of 0.5 (both in AIDA and FIBEN) such as *Research and development* would increase by 17% if Naples had Milan’s endowment of civic capital. In industries with more adjustment scope the impact of the change in civic capital is more pronounced. Consider the case of an industry with a  $CV_s$  of 0.9 (both in AIDA and FIBEN) such as *Wholesale trade and commission trade, except of motor vehicles and motorcycles*. If Naples had the same civic capital of Milan in this industry, the average PSI of Neapolitan firms would increase by 35%. These two values are both larger than the average estimate over different industries of 11% that we get in the baseline specification, where we include regional fixed effects instead of provincial fixed effects.<sup>27</sup>

The positive and statistically significant coefficient  $\alpha_2$  of the size of the upstream service market does not increase with the industry dispersion in service outsourcing, because the interaction coefficient  $\alpha_3$  is not statistically different from zero in all our specifications. Contrary to civic capital, the upstream number of service workers has an impact on PSI that is the same across industries, irrespective of the industry value of  $CV_s$ . Not all provincial regressors that turn out to be positively related to average PSI do necessarily have an impact that is heterogenous according to a characteristic such as  $CV_s$ . This confirms that the specification in equation (2) captures a mechanism that is specific to the relationship between civic capital and service outsourcing.

### 5.3 Robustness checks

In Table 5 we present several robustness checks, when the main regressor is the principal component of civic capital.

[Insert Table 5 about here]

In column (1) we allow nonlinearities in firm-level variables by including squared controls. In column (2) the provinces of Milan, Rome and Turin are excluded. In all these cases the coefficient of civic capital is statistically significant and stable compared to the baseline estimates.

Column (3) shows results obtained restricting the sample to the firms belonging to the manufacturing sector (NACE 15 to 36), and column (6) to those operating in services (NACE greater

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<sup>27</sup>Even in the industry with the lowest coefficient of variation, *Insurance and pension funding, except compulsory social security*, the estimated increase in PSI from Naples to Milan-level is 10%, quite close to the baseline.

than 40, except industries mentioned in footnote 6). For manufacturing firms, column (3), we get a civic capital coefficient that is not statistically different from zero.<sup>28</sup>

As pointed out by Berlingieri (2015), service outsourcing may be an organisational response to the firms' engagement in international trade, and to export shocks in particular. For this reason, in order to explore the robustness of the results when accounting for a proxy for the involvement in international trade and related shocks, in columns (4) and (5) we add as a control variable the 7-year average of the number of exported products (HS 6-digit classification) to Eastern Europe or China by province-industry.<sup>29</sup> The point estimate of civic capital increases in magnitude with respect to column (3) and becomes statistically significant. In line with Berlingieri (2015), the coefficient on the number of exported products is positive and statistically significant, but the number of upstream service workers becomes insignificant. An additional caveat stems from concerns related to the endogeneity of the province-industry export control: having a Ricardian setting in mind, the number of exported products in the province-industry is increasing in the relative province-industry productivity, which in turn could be an outcome of service outsourcing according to our conceptual framework.

In the subsample made by service firms, column (6), the coefficient for civic capital is statistically significant and equal to 0.023. A possible interpretation for the difference in the estimates between manufacturing and service firms is that the latter are smaller than the former, and much more likely to be single-plant entities: this may help for an accurate estimation of the civic capital coefficient.

Taking as a benchmark the EU definition for small firms (less than 50 employees and less than 10 millions Euros turnover), we keep in the sample only firms below these thresholds, on the ground that they are less likely to operate in multiple provinces. We verify in column (7) that results are robust to the exclusion of the largest firms. Finally, in column (8) we keep in the sample only firms with a value for PSI smaller than 100 percentage points, without any noticeable impact on

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<sup>28</sup>The coefficient is statistically significant when we employ the referenda turnout as main regressor instead of the principal component (Appendix B).

<sup>29</sup>This is a measure of a firm potential exposure to export opportunities with Eastern Europe and China, since we do not observe the real number of products that each firm exports to the two destination areas. We describe the construction of this variable in the appendix. We choose Eastern Europe and China as destination markets because they became progressively more integrated with Italy and the European Union in the 1990s, and we thus follow noticeable papers (e.g. Dauth et al., 2014; Helm, 2020) that have looked at the labor market effect in Germany of trade integration with these areas over the years 2000s.

our estimates. Overall, with the exception of the manufacturing regressions, the point estimate of the civic capital variable stays constant around a value of 0.02 in the robustness checks.

## 6 2SLS with historical instrumental variables

### 6.1 Historical IVs and the validity of exclusion restrictions

Instrumenting civic capital with historical measures is a widely adopted strategy in the literature aimed at establishing a causal relationship between civic capital and socio-economic outcomes (de Blasio and Nuzzo, 2010; Tabellini, 2010; Guiso et al., 2016). In reason of the high persistence of civic behaviour highlighted in the literature, deeply lagged measures of civiness have become natural candidates as instruments for current levels. We follow de Blasio and Nuzzo (2010) and Bürker and Minerva (2014) for the choice of historical instruments in the Italian context.

The first set of instruments that we use measures civiness through electoral turnout in the 1920s and membership in mutual aid societies that emerged in the late 19th century. Individuals that participate in political elections express a concern for common good. Putnam (1993) argues that electoral turnout at the beginning of the 20th century is likely to be driven by civic-minded behaviour as voter turnout strongly correlates with other measures of social solidarity. The measure of electoral turnout in the 1920s, the first with male universal suffrage, is an average of voter participation at the regional level over two national elections from 1919 and 1921, and two communal elections from 1920. As to mutual aid societies, they were created in the middle of the 19th century as a response to the economic and social hardships brought about by industrialization. These aid societies provided to their members basic services such as medical care and insurance against work accidents. Putnam (1993) stresses that the disposition to cooperation necessary for the functioning of mutual aid societies was sustained by mutual reciprocity rather than formalized enforcement and monitoring. As such, they express values and beliefs similar to the traits civic capital aims to capture. The importance of mutual aid societies at the local level is measured by the membership rate, i.e. the number of members in mutual aid societies per 100,000 inhabitants. This information is available at the regional level and refers to the year 1873.

The second set of historical variables goes back to the Middle Age and captures information on the free-city states that existed before 1300 in Northern Italy. Lacking any central power, free-city states were created by citizens to address problems of common interest, in particular mutual



security. City states were characterized by a high degree of civic participation in political decision-making. The free-city state experience favoured the creation of horizontal ties and a strong sense of civic cooperation. Guiso et al. (2016) show how these cooperative values and beliefs persist until today. Based on information provided in Guiso et al. (2008), we count for each province the number of free-city states that existed before 1300. The resulting variable varies between 0 and 3. As the free-city states existed predominantly in the North and Center of the Italian peninsula, the South and Islands are not included in the regressions.<sup>30</sup>

Therefore, the IV approach hinges on the historical persistence of civiness and, more in general, of informal institutions. The historical variables we exploit are assumed to have directly affected civiness at the time when the IVs are measured and, hence, to affect the current level of civiness through the persistence of the process of accumulation of civic capital over the centuries, this resulting in relevant instruments.

In order to be valid, the instruments must affect PSI only through the contemporaneous stock of civic capital. The empirical literature on civic capital has acknowledged that this might not be straightforward (Durlauf, 2002; Tabellini, 2010; Guiso et al., 2011). The main challenge is that the historical episodes that determined the accumulation of civic capital might also have boosted other assets omitted from the regression (e.g., the artistic heritage of cities; the transportation network) that were thus co-determined with current civic capital and that may in principle also influence the outcome of interest. If the historical accumulation of civiness favoured the rising of other factors which come out to be equally persistent as civic capital and affect outsourcing decisions directly, the exclusion restrictions would be violated. Such factors may lead to an overestimation of the true effect of civic capital, provided that we expect a positive correlation between the omitted factors and civiness, and also a positive impact of both on outsourcing.<sup>31</sup>

Still, we rely on valid exclusion restrictions for those omitted factors that are less persistent than civiness or informal institutions. In a historical perspective, the direct link between historical determinants of civiness and firms' trust in market relationships is consistent with the seminal findings by Putnam (1993), according to which civiness has been highly persistent in Italy over the

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<sup>30</sup>Specifically, the regions of Campania, Molise, Apulia, Basilicata, Calabria, Sicily, and Sardinia are dropped.

<sup>31</sup>The comparison of the OLS baseline model with the specification in section 5.2, where industry heterogeneity is accounted for, complements the analysis and gives a sense of whether the threat of an upward bias coming from persistent omitted factors at the provincial level is serious or not. We conclude that there is no sign of an upward bias of the coefficient estimate of civic capital in the baseline specification.

centuries, as well as differences in the endowment of civic capital across Italian regions. In contrast, the provincial differences in potential omitted factors (e.g., outcomes in the labour market in terms of employment or wages) have been by far less persistent over time, thus reducing the risk that these factors are systematically affected by the level of historical civic capital (de Blasio and Nuzzo, 2010).

## 6.2 Instrumental variable results

We have assumed so far that, conditional on the covariates, the stock of civic capital is uncorrelated with the error term  $\epsilon_{i,j,s,t}$ . If this assumption is not satisfied, we may get a spurious relationship between civic capital and PSI. In column (1) of Table 6 we present the estimates of equation (1) where the regional fixed effects have been replaced with dummies for the five macro-regions of the country: North-West, North-East, Center, South, and Islands. This choice is motivated by the fact that the data on mutual aid societies and turnout in the 1920s are available only at the regional level. In addition to that, in column (2), Southern and insular regions are excluded from the estimating sample for comparability with the regressions involving free-city states. Compared to the baseline regression, the coefficient of civic capital in column (1) is larger in magnitude, possibly due to the inclusion of macro-region dummies. When excluding the South and the islands, the sample variation in civic capital is reduced. Column (2) shows that the results are robust to such an exclusion, supporting the overall reliability of our findings.

[Insert Table 6 about here]

The first set of instruments for civic capital includes the electoral turnout in the 1920s and the number of mutual aid societies. In columns (3) through (5) we employ the two IVs, both separately and jointly. The first stage estimates, reported in Panel B, present a positive sign for the IV coefficients and point to the relevance of the accumulation of civic capital over time in determining current civiness. With respect to the relevance of the IVs, the  $F$ -statistics for the excluded instruments are large and both variables are jointly significant.<sup>32</sup> The second stage results are reported in Panel A. A positive and significant coefficient for civic capital suggests that civiness favors business service outsourcing of firms in line with the OLS estimates, but the magnitude of

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<sup>32</sup>As for identification, the Kleibergen-Paap and Anderson-Rubin test statistics point to a genuine model identification. These tests are not reported in the table to save on space.

the 2SLS coefficient is larger. IV coefficients larger than the corresponding OLS estimates are frequently found in the related literature (Acemoglu et al., 2001; Tabellini, 2010; Guiso et al., 2016; Gorodnichenko and Roland, 2017). Acemoglu et al. (2001) and Gorodnichenko and Roland (2017) argue that the increase is likely to be driven by measurement error. This would imply that even after extracting the principal component, civic capital is still noisily measured, thus introducing a downward bias in OLS.

Finally, in the last column we instrument civic capital with the number of free-city states that existed before 1300 in each province. The 2SLS results from the first stage, reported in column (6), show that the instrumental variables are relevant. The presence of a free-city state in a province significantly increases the stock of civic capital compared to provinces with no free cities. The increase in the current stock of civic capital is even larger if the province hosted two free-city states.<sup>33</sup> The three instrumental variables are jointly significant with a satisfactory  $F$ -statistic. The second stage results in panel A confirm previous findings. Even when instrumented with historical events dating back to the Middle Age, civic capital positively affects contemporary service outsourcing of firms. The magnitude of the estimated 2SLS coefficient is again slightly larger than its OLS counterpart of column (2).

Overall, the results obtained with external historical instruments produce a coherent picture, independently of whether we instrument civic capital with measures of civic participation that refer to the first decades after the Italian unification (1861) or with historical events that occurred in the Middle Age. In the appendix we replicate 2SLS with historical IVs for the robustness checks.

## 7 Conclusions

This paper provides empirical evidence that civic capital shapes the intensity of service outsourcing in business-to-business transactions. The result can be attributed to the fact that, in more civic areas, the incidence of opportunistic behaviour on the part of the contracting parties is reduced, and this is something which improves contractual outcomes and sustains more market exchange between independent firms.

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<sup>33</sup>We are not particularly worried by the fact that having three free cities in 1300 is not statistically related to a higher level of civic capital today. Notice that there are just three provinces with 3 free-city states (Alessandria, Cuneo and Turin) and they are all located in Piedmont. We believe that there is not enough variability to warrant the identification of the free-city effect in this case.

Understanding the firm's choice of whether to produce a given input in-house, or purchase it from external suppliers is a fundamental concern in economics. Despite several influential theories and a huge amount of empirical studies, the pronounced differences that exist in the organization of production of firms are not yet fully understood. Analyzing the importance of informal institutions, and in particular the role of cooperative values that prevail in a given area, might advance our understanding of the determinants of the costs of contracting, a crucial aspect at the heart of most of the theoretical contributions in this field.

At the same time our analysis sheds some light on how civic capital spurs aggregate economic performance. We have shown how to cast the decision about the purchase of services on the market and the distortions related to civic capital in a simple framework in accordance with Hsieh and Klenow (2009). In the future, the analysis can be extended towards a finer quantification of the misallocation gap due to the lack of civic capital.

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## References

- Abraham, K. and S. Taylor, 1996: Firms' use of outside contractors: Theory and evidence. *Journal of Labor Economics*, **14**(3), 394–424.
- Abramovsky, L. and R. Griffith, 2006: Outsourcing and Offshoring of Business Services: How Important is ICT? *Journal of the European Economic Association*, **4**(2-3), 594–601.
- Acemoglu, D., S. Johnson, and T. Mitton, 2009: Determinants of Vertical Integration: Financial Development and Contracting Costs. *Journal of Finance*, **64**(3), 1251–1290.
- Acemoglu, D., S. Johnson, and J. Robinson, 2001: The colonial origins of comparative development: An empirical investigation. *American Economic Review*, **91**(5), 1369–1401.

- Algan, Y. and P. Cahuc, 2014: Trust, Growth, and Well-Being: New Evidence and Policy Implications. In *Handbook of Economic Growth*, volume 2 of *Handbook of Economic Growth*. Elsevier, 49-120.
- Baker, G., R. Gibbons, and K. J. Murphy, 2002: Relational Contracts And The Theory Of The Firm. *The Quarterly Journal of Economics*, **117**(1), 39–84.
- Benfratello, L., F. Schiantarelli, and A. Sembenelli, 2008: Banks and innovation: Microeconomic evidence on Italian firms. *Journal of Financial Economics*, **90**(2), 197–217.
- Berlingieri, G., 2015: Managing Export Complexity: the Role of Service Outsourcing. Mimeo, London School of Economics.
- Bloom, N., R. Sadun, and J. V. Reenen, 2012: The organization of firms across countries. *Quarterly Journal of Economics*, **127**(4), 1663–1705.
- Boehm, J. and E. Oberfield, 2020: Misallocation in the Market for Inputs: Enforcement and the Organization of Production. *Quarterly Journal of Economics*, **135**(4), 2007–2058.
- Buonanno, P., D. Montolio, and P. Vanin, 2009: Does Social Capital Reduce Crime? *Journal of Law & Economics*, **52**(1), 145–170.
- Bürker, M. and G. A. Minerva, 2014: Civic capital and the size distribution of plants: short-run dynamics and long-run equilibrium. *Journal of Economic Geography*, **14**(4), 797–847.
- Cameron, A. C., J. B. Gelbach, and D. L. Miller, 2008: Bootstrap-based improvements for inference with clustered errors. *Review of Economics and Statistics*, **90**(3), 414–427.
- Cameron, A. C. and D. L. Miller, 2015: A Practitioner’s Guide to Cluster-Robust Inference. *Journal of Human Resources*, **50**(2), 317–372.
- Cartocci, R., 2007: *Mappe del tesoro: Atlante del capitale sociale in Italia*. Il Mulino, Bologna.
- Casaburi, L. and G. A. Minerva, 2011: Production in advance versus production to order: The role of downstream spatial clustering and product differentiation. *Journal of Urban Economics*, **70**(1), 32–46.
- Coase, R., 1937: The Nature of the Firm. *Economica*, **4**, pp. 386–405.
- Dauth, W., S. Findeisen, and J. Suedekum, 2014: The rise of the East and the Far East: German labor markets and trade integration. *Journal of the European Economic Association*, **12**(6), 1643–1675.
- de Blasio, G. and G. Nuzzo, 2010: Historical traditions of civiness and local economic development. *Journal of Regional Science*, **50**(4), 833–857.
- DeBandt, J., 1996: Business services: Markets and transactions. *Review of Industrial Organization*, **11**(1), 19–33.
- Durlauf, S. N., 2002: On the empirics of social capital. *Economic Journal*, **112**(483), F459–F479.
- Galdon-Sanchez, J. E., R. Gil, and A. Bayo-Moriones, 2015: Outsourcing of peripheral services: Evidence from Spanish manufacturing plant-level data. *European Economic Review*, **78**(C), 328–344.
- Gorodnichenko, Y. and G. Roland, 2017: Culture, Institutions, and the Wealth of Nations. *Review of Economics and Statistics*, **99**(3), 402–416.
- Grossman, G. M. and E. Helpman, 2002: Integration versus Outsourcing in Industry Equilibrium. *Quarterly Journal of Economics*, **117**(1), 85–120.

- Guiso, L., P. Sapienza, and L. Zingales, 2004: The Role of Social Capital in Financial Development. *The American Economic Review*, **94**(3), 526–556.
- Guiso, L., P. Sapienza, and L. Zingales, 2008: Long Term Persistence. NBER Working Papers 14278, National Bureau of Economic Research.
- Guiso, L., P. Sapienza, and L. Zingales, 2011: Civic Capital as the Missing Link. volume 1 of *Handbook of Social Economics*. North-Holland, 417 - 480.
- Guiso, L., P. Sapienza, and L. Zingales, 2016: Long-Term Persistence. *Journal of the European Economic Association*, **14**(6), 1401–1436.
- Görg, H. and A. Hanley, 2011: Services Outsourcing And Innovation: An Empirical Investigation. *Economic Inquiry*, **49**(2), 321–333.
- Helm, I., 2020: National Industry Trade Shocks, Local Labour Markets, and Agglomeration Spillovers. *Review of Economic Studies*, **87**(3), 1399–1431.
- Helsley, R. W. and W. C. Strange, 2007: Agglomeration, opportunism, and the organization of production. *Journal of Urban Economics*, **62**(1), 55–75.
- Holmes, T., 1999: Localization of industry and vertical disintegration. *Review of Economics and Statistics*, **81**(2), 314–325.
- Hsieh, C.-T. and P. J. Klenow, 2009: Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics*, **124**(4), 1403–1448.
- Kelly, M., 2019: The Standard Errors of Persistence. Working Papers 201913, University College Dublin.
- Lafontaine, F. and M. Slade, 2007: Vertical Integration and Firm Boundaries: The Evidence. *Journal of Economic Literature*, **45**(3), 629–685.
- Li, B. and Y. Lu, 2009: Geographic concentration and vertical disintegration: Evidence from China. *Journal of Urban Economics*, **65**(3), 294–304.
- Macchiavello, R., 2012: Financial Development and Vertical Integration: Theory and Evidence. *Journal of the European Economic Association*, **10**, 255–289.
- Merino, F. and D. Rodrand, 2007: Business services outsourcing by manufacturing firms. *Industrial and Corporate Change*, **16**(6), 1147–1173.
- Ono, Y., 2003: Outsourcing business services and the role of central administrative offices. *Journal of Urban Economics*, **53**(3), 377–395.
- Ono, Y., 2007: Market thickness and outsourcing services. *Regional Science and Urban Economics*, **37**(2), 220 – 238.
- Putnam, R., 1993: *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.
- Rauch, J. E., 1999: Networks versus markets in international trade. *Journal of International Economics*, **48**(1), 7–35.
- Roodman, D., J. G. MacKinnon, M. O. Nielsen, and M. D. Webb, 2019: Fast and wild: Bootstrap inference in Stata using boottest. *Stata Journal*, **19**(1), 4–60.
- Schwartz, A., 1993: Subservient Suburbia - The Reliance of Large Suburban Companies on Central City Firms for Financial and Professional Services. *Journal of the American Planning Association*, **59**(3), 288–305.

- Tabellini, G., 2010: Culture and institutions: Economic development in the regions of Europe. *Journal of the European Economic Association*, **8**(4), 677–716.
- Williamson, O. E., 1975: *Markets and Hierarchies: Analysis and Antitrust Implications*. The Free Press, New York.
- Williamson, O. E., 1979: Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics*, **22**(2), 233–261.
- Williamson, O. E., 1985: *The Economic Institutions of Capitalism*. The Free Press, New York.
- Williamson, O. E., 1993: Calculativeness, trust, and economic organization. *The Journal of Law & Economics*, **36**(1), 453–486.
- Williamson, O. E., 1996: *The Mechanisms of Governance*. Oxford University Press, New York.

## A Appendix

### A.1 A three-input version of Hsieh and Klenow (2009)

We present a stylized model that extends Hsieh and Klenow (2009) to the case of three inputs (capital, labour and services) to further clarify our empirical strategy. Assume that industry  $s$  is populated by monopolistically competitive firms. Firm  $i$  in province  $j$  in industry  $s$  has a production function equal to

$$Y_{i,j,s} = A_{i,j,s} K_{i,j,s}^{\alpha_s} L_{i,j,s}^{\beta_s} M_{i,j,s}^{1-\alpha_s-\beta_s},$$

where  $A_{i,j,s}$  is total factor productivity,  $K_{i,j,s}$  is capital,  $L_{i,j,s}$  is labour, and  $M_{i,j,s}$  are service inputs. Hsieh and Klenow (2009) denote the existence of distortions that constrain firms in the use of all inputs by the same proportion as an output distortion  $\tau_Y$ . In addition, we posit the existence of a distortion in the use of services, and we indicate it as  $\tau_M$ . Profits are then given by

$$\pi_{i,j,s} = (1 - \tau_{Y_{i,j,s}}) P_{i,j,s} Y_{i,j,s} - R K_{i,j,s} - w L_{i,j,s} - (1 + \tau_{M_{i,j,s}}) v M_{i,j,s},$$

where  $P_{i,j,s}$  is output price and  $R$ ,  $w$ , and  $v$  are input prices.

Profits maximization yields the following expression for the firm output price,  $P_{i,j,s}$ , as a fixed markup over marginal cost

$$P_{i,j,s} = \frac{\sigma}{\sigma - 1} \frac{1}{(1 - \tau_{Y_{i,j,s}})} MC_{i,j,s},$$

where  $MC_{i,j,s}$  is the marginal cost and it is equal to:

$$MC_{i,j,s} = \left(\frac{R}{\alpha_s}\right)^{\alpha_s} \left(\frac{w}{\beta_s}\right)^{\beta_s} \left(\frac{(1 + \tau_{M_{i,j,s}})v}{1 - \alpha_s - \beta_s}\right)^{(1-\alpha_s-\beta_s)} \frac{1}{A_{i,j,s}}.$$

It is then straightforward to compute the firm-level demand for services,  $M_{i,j,s}$ , and Purchased Service Intensity, defined as service expenditure over sales,  $PSI_{i,j,s} \equiv (v M_{i,j,s}) / (P_{i,j,s} Y_{i,j,s})$ :

$$\begin{aligned} M_{i,j,s} &= \frac{(1 - \alpha_s - \beta_s) Y_{i,j,s} MC_{i,j,s}}{(1 + \tau_{M_{i,j,s}}) v}, \\ PSI_{i,j,s} &= (1 - \alpha_s - \beta_s) \frac{\sigma - 1}{\sigma} \frac{(1 - \tau_{Y_{i,j,s}})}{(1 + \tau_{M_{i,j,s}})}. \end{aligned}$$



As in Hsieh and Klenow (2009) we can also write input allocations across firms as:

$$\begin{aligned} M_{i,j,s} &\propto \frac{A_{i,j,s}^{\sigma-1}(1 - \tau_{Y_{i,j,s}})^{\sigma}}{(1 + \tau_{M_{i,j,s}})^{(1-\alpha_s-\beta_s)(\sigma-1)+1}}, \\ K_{i,j,s} &\propto \frac{A_{i,j,s}^{\sigma-1}(1 - \tau_{Y_{i,j,s}})^{\sigma}}{(1 + \tau_{M_{i,j,s}})^{(1-\alpha_s-\beta_s)(\sigma-1)}}, \\ L_{i,j,s} &\propto \frac{A_{i,j,s}^{\sigma-1}(1 - \tau_{Y_{i,j,s}})^{\sigma}}{(1 + \tau_{M_{i,j,s}})^{(1-\alpha_s-\beta_s)(\sigma-1)}}. \end{aligned}$$

Our working hypothesis, discussed at length in the main text, is that the stock of local civic capital reduces the distortion related to the purchase of services, lowering  $\tau_M$ . Civic capital may also lower the distortions that affect output (equivalent to the distortions on all inputs), which translates into a lower  $\tau_Y$ . In any case, the prediction is that civic capital unambiguously raises *PSI*, as well as the use of capital, labour, and services at the firm level. This stylized model shows that the findings in Bürker and Minerva (2014), where civic capital is found to have a positive impact on size, can be easily reconciled with the findings of this paper, where civic capital is shown to have a positive impact on service outsourcing. Under the assumptions of the model, firm-level TFP,  $A_{i,j,s}$ , does not correlate with *PSI*, while it positively correlates with the quantity of inputs (capital, labour, services) used.

## A.2 Checking spatial sorting of firms

In the maps that follow we provide evidence of the absence of spatial sorting of firms across provinces, based on some key observable variables. Every regression in the main text contains regional fixed effects, so our primary concern is showing the absence of spatial sorting within regions.

The first variable we use to check for spatial sorting is industry-level Purchased Service Intensity, computed from the UK 2001 Input-Output (IO) Use tables. The IO Use tables provide for each downstream industry the type and the amount of purchased inputs. We establish a concordance between the UK IO classification and the Ateco 2-digit classification, we sum over intermediates corresponding to business services, and then divide by total sales of the downstream industry, to retrieve the industry-level measure of *PSI*. We then group the 2-digit industries in four different quartiles,  $k = \{1, 2, 3, 4\}$ , according to their industry-level *PSI*, and compute for each province  $j$  and for each quartile  $k$  the share in terms of the number of firms in the sample,  $n_{j,k}/N_j$ , where  $n_{j,k}$  is the number of firms in the province-quartile, and  $N_j$  is the total number of firms in province  $j$ . Lastly, the provincial share is normalized by the regional average share, so that final provincial scores are larger or smaller than one according to whether each province-quartile hosts a share of firms that is larger or smaller than the corresponding average regional value. In the maps of Figure 5, in each of the four panels the size of a dot is proportional to the normalized share of firms in that province. The maps show that, within each quartile of industry *PSI*, there is a remarkable similarity in terms of the provincial share of firms in the data set. Consequently, there is not any apparent spatial sorting of firms based on the level of civic capital; that is, in industries characterized by the highest propensity to outsource business services, provinces with the highest stock of civic capital do not host a disproportionately high share of firms in comparison to other provinces in the region.

[Insert Figure 5 about here]

We also replicate the exercise above after computing industry *PSI* at the 2-digit level as the average of firm-level *PSI* in our AIDA sample. The pairwise correlation coefficient between the industry-level *PSI* from the UK IO Use tables and from the AIDA sample is 0.50. The maps are qualitatively similar and we do not show them to save on space.



Finally, we group 2-digit industries in quartiles according to the industry average size of firms, computed from Istat 2001 Business Census, and we plot the relative share of firms by province-quartile following a procedure similar to the one described above. The maps are shown in Figure 6. Again, within each quartile of industry average size, we do not identify any spatial sorting of firms consistently correlated to the level of provincial civic capital. The larger apparent size of dots in the last two panels of Figure 6 is simply due to the presence of provinces with a small normalized score (Grosseto, with a score of 0.38 in the 3rd quartile, and Rieti, with a score of 0.26 in the 4th quartile) so all other dots are rescaled accordingly. We also replicate the exercise after computing average industry size at the 2-digit level from the size of firms in our AIDA sample. The pairwise correlation coefficient between the industry-level size from the 2001 Istat Census and from the AIDA sample is 0.49. The maps are qualitatively similar and we do not show them to save on space.

[Insert Figure 6 about here]

Summarizing our findings, we do not identify any tendency of spatial sorting in the data that needs a particular scrutiny.

### A.3 Detailed description of the data

#### A.3.1 Definition of Purchased Services

Under the Italian accounting system, the exact amount of purchased services is reported in a specific item in the profit and loss account of each firm in the section dedicated to the costs of production. This item contains all the services expenses coming from ordinary firm activity. The list that follows provides some of the most common services purchases: Travel and accommodation expenses - Repairing and maintenance carried out by external firms - Intermediate production stages outsourced to external firms - Advising in the technical, legal, fiscal, administrative, commercial and accounting fields - Advertising and marketing - Commissions and reimbursement of expenses for agents and representatives - Vigilance and security - Cleaning - Remunerations and reimbursements paid to administrators and auditors - Costs for the personnel temporary hired from other firms - Costs for the canteen, nursery school, holiday camps, employees clubs, etc. (these costs are net of the amount of money that is to be charged to employees) - Costs for luncheon vouchers distributed to employees - Costs for refresher courses for employees - Costs for board and lodging of employees in secondment - Electricity, telephone, fax, water, gas, and other utilities. The item B7 also lists costs for services provided by banks and financial agencies different from true financial charges. Those include: rental fees for safe-deposit boxes, service payments for utilization fees, costs for safe-keeping of bonds, commissions for bond bails (if not held to obtain financing), expenses and commissions for factoring (excluding financial charges), expenses for valuation of real estates to obtain loans, expenses for preliminary investigations of real estates and financing (in general, all those expenses different from interests and discounts, commissions of financing and bank charges and their collateral.)

#### A.3.2 Measures or instruments for civic capital

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

Verbano-Cusio-Ossola (Novara). The source of data for referendum turnout is the Ministry of the Interior.

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

*Volunteers:* It is the number of volunteers in non-profit organizations. Data refer to the year 2000 and the source is de Blasio and Nuzzo (2010).

*Turnout in 1920s:* It is the average electoral turnout at the regional level in the national elections of 1919 and 1921, provincial elections in 1920 and communal elections in 1920. There is no data for the regions of Valle d'Aosta, Trentino-Alto Adige and Friuli-Venezia Giulia. We adopt the values of Piedmont for Valle d'Aosta, the region from which it was split off. For the latter two regions, we adopt the values of Veneto, which is socio-geographically the closest one. The source of these data is Putnam (1993).

*Mutual aid societies in 1873:* It is the number of the members in mutual aid societies in 1873 at the regional level, standardized by 100,000 inhabitants. Data for Valle d'Aosta, Trentino-Alto Adige and Friuli-Venezia Giulia are missing. We adopt the values of Piedmont for Valle d'Aosta, the region from where it was split off. For the latter two regions, we adopt the values of Veneto, which is socio-geographically the closest one. Additionally, there is no data for Molise, for which we take the value of Abruzzo, the region from where it was split off. The source is Putnam (1993).

*Number of free-city states in 1300:* It is the number of free-city state experiences in the territory of each province in 1300. Data are from Guiso et al. (2008). In order to reduce the cost of collecting historical data at the town level, the authors analyze the history of the 400 biggest cities in terms of 1871 population in the area that was under the Holy Roman Empire at the beginning of the second Millennium (basically, the Center-North of Italy).

### A.3.3 Other provincial explanatory variables

*Upstream service workers:* We take the information on the number of service workers in the province, disaggregated by industry, from the universe of Italian enterprises in the *Archivio Statistico delle Imprese Attive* (Statistical Archive of Active Enterprises) administered by Istat. The data refer to the years from 2001 to 2007 and are extracted for the interval of two-digit industries 50-74. For each two-digit upstream service industry, we also use the information on the amount of intermediate services purchased by each two-digit downstream industry contained in the 2001 Input-Output Use tables from the United Kingdom. This allows to retrieve the share that each two-digit downstream industry purchases from each two-digit upstream service industry, and to weight the upstream service industry employment in the province accordingly.

*Length of trials:* It is the number of days it takes to complete a first degree trial in labor affairs in each of the 165 Italian labor courts. The data refer to the years from 1995 to 2001 (earlier years are not available) and are provided by Istat in the data base Territorial Information System on Justice (Sistema Informativo Territoriale sulla Giustizia). Since there are more courts than provinces and since in some cases the territory of a court belongs to two different provinces we proceed as follows. First, we assign to each city in the province the value of the court to which the city belongs. This information is then averaged over all the cities belonging to the same province to get a provincial variable.

*Bank branches:* It is the number of bank branches per 10,000 inhabitants, disaggregated by province. Data are from the Bank of Italy's *Base Informativa Pubblica*.

*University graduates:* It is the number of university graduates per 100 inhabitants, disaggregated by province. Data are from Istat.

*Number of exported products to Eastern Europe or China:* First of all, we retrieve the number of exported products at the national level from Italy to Eastern Europe or China for each year from 2001 to 2007. In the definition of Eastern Europe we include the following countries: Bulgaria, Czechia, Hungary, Poland, Romania, Slovakia, Slovenia, Russian Federation, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Rep. of Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan. We use the database BACI from CEPII (France), which provides COMTRADE data on value and quantity exported for products classified at the 6-digit Harmonized System (HS6). We then match HS6 to our NACE rev 1.1. classification, and count the number of exported HS6 products by 3-digit NACE rev 1.1. industry. Subsequently, the national number of exported products by 3-digit industry and destination area (either Eastern Europe or China) is apportioned to each province in terms of the 2001 provincial share in the national 3-digit industry employment.

## **B Appendix**

This appendix contains some additional regressions for our paper.

### **Industry heterogeneity with an alternative measure of the coefficient of variation in PSI**

In Table B-1 we replicate the regressions exploiting industry heterogeneity with respect to civic capital if we compute the coefficient of variation for each industry after dropping firms with a PSI larger than 200 percentage points.

[Insert Table B-1 about here]

### **Robustness checks employing referenda turnout as main regressor**

In Table B-2 we replicate the robustness checks employing referendum turnout as main regressor, instead of the principal component.

[Insert Table B-2 about here]

### **2SLS for robustness checks**

In Table B-3 and B-4 we replicate the robustness checks employing 2SLS and the historical instruments described above.

[Insert Table B-3 and B-4 about here]

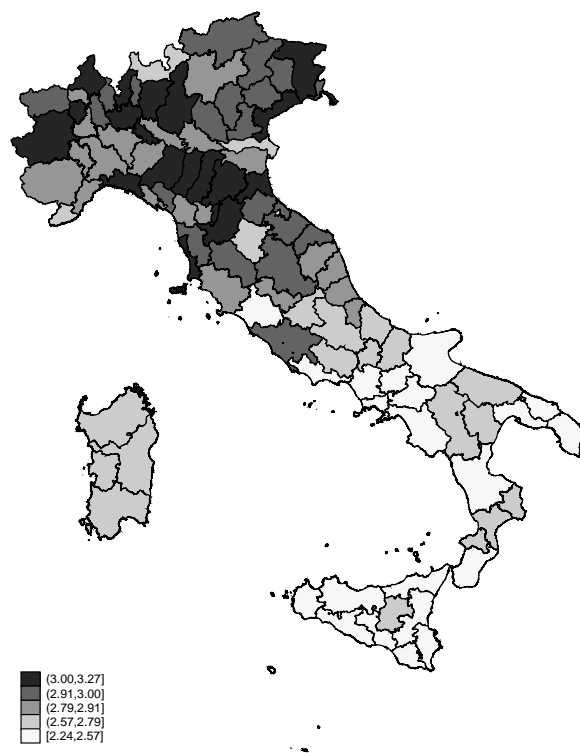


Figure 1: Average PSI across provinces.

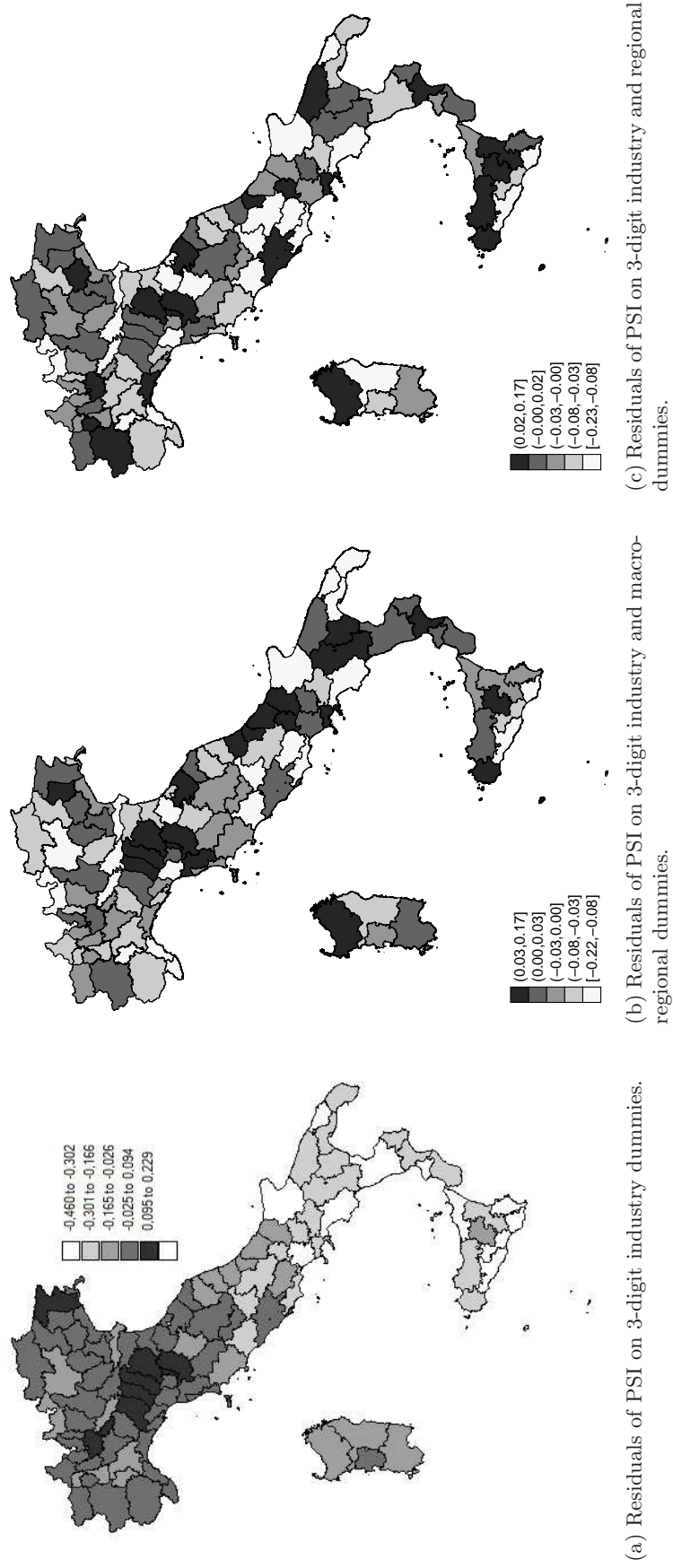


Figure 2: Provincial average of firm-level residuals.

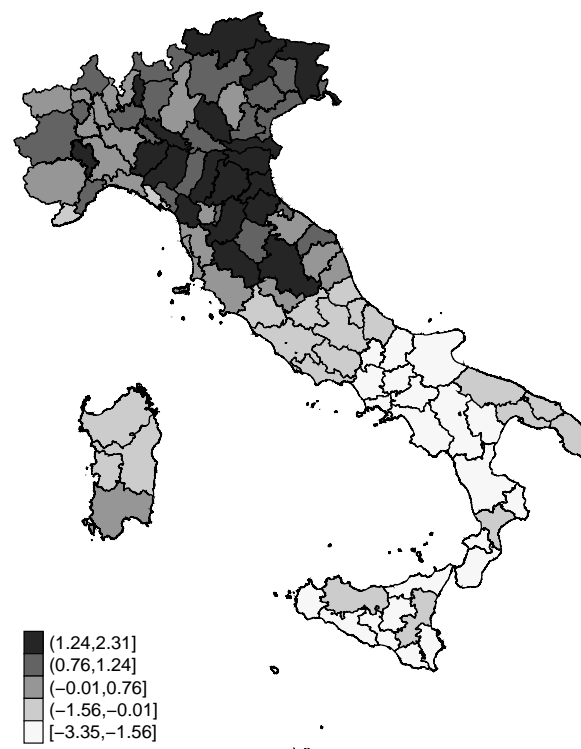
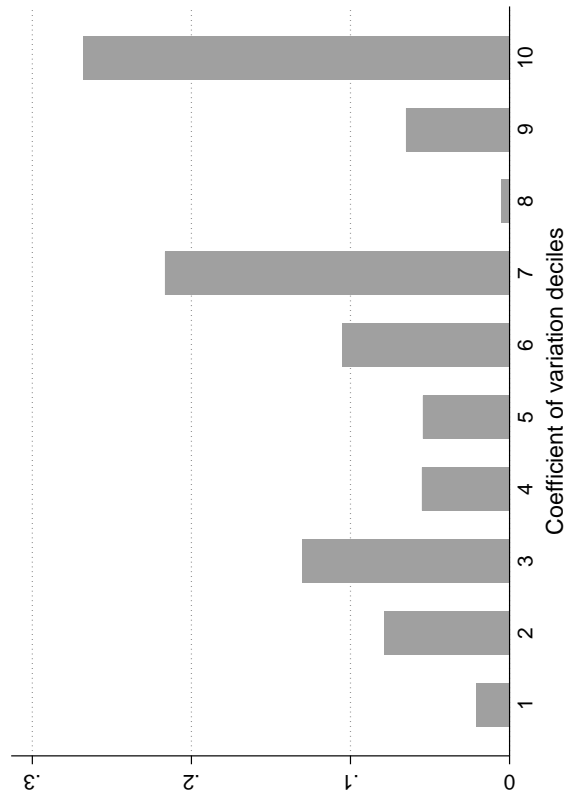
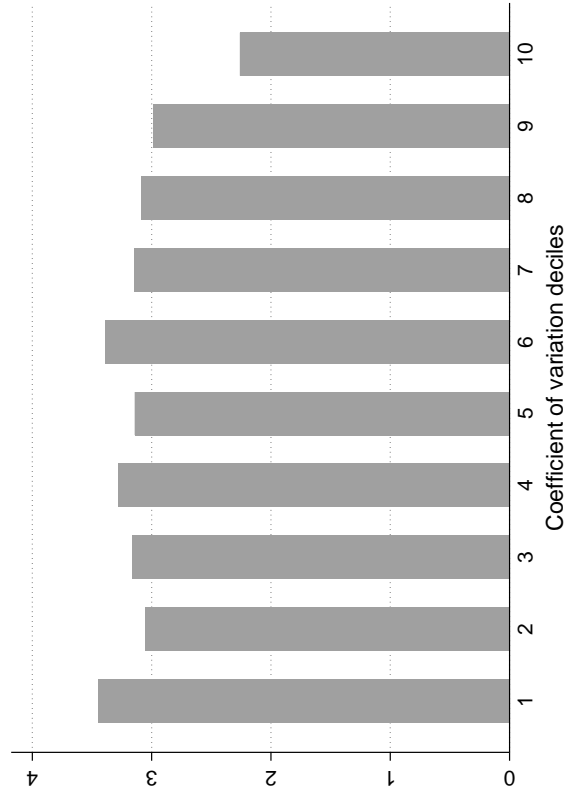


Figure 3: Map of civic capital measured by the first principal component of blood donations, volunteering, and electoral turnout.

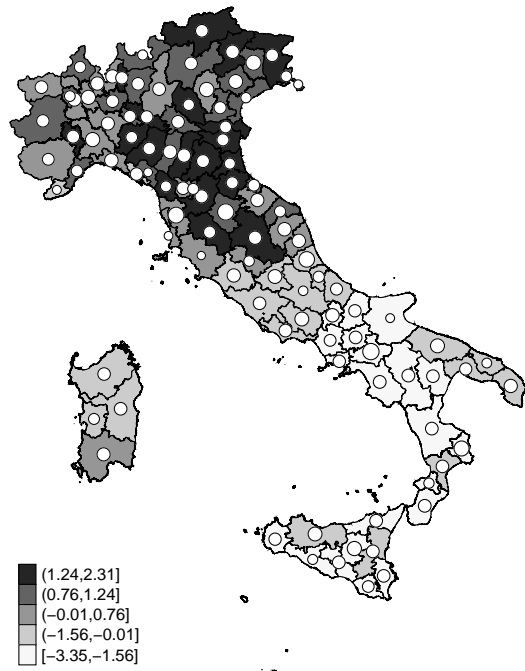


(a) Frequency of firms in the sample by industry coefficient of variation.

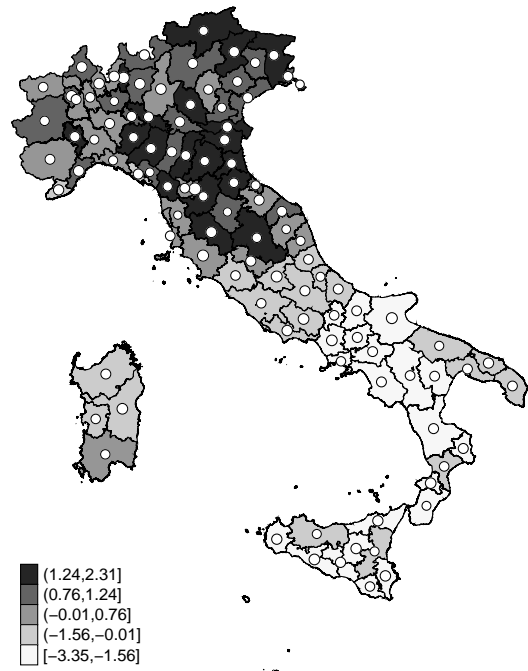


(b) Average of log PSI of firms in the sample by industry coefficient of variation.

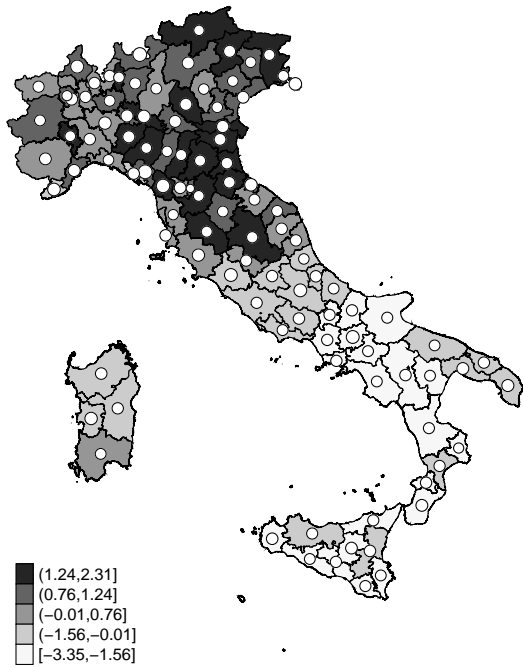
Figure 4: Descriptive statistics by industries grouped in terms of coefficient of variation deciles.



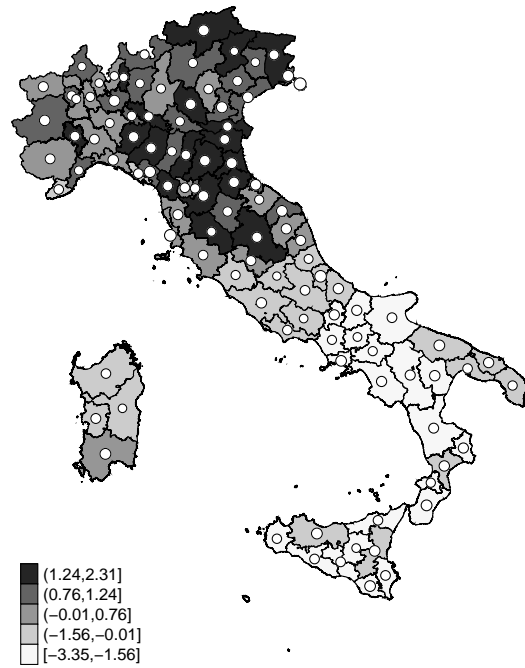
(a) Relative share of firms for industries in the first quartile.



(b) Relative share of firms for industries in the second quartile.



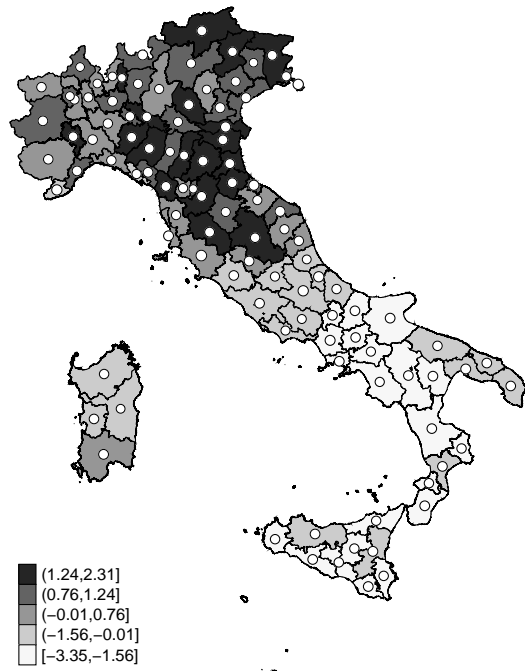
(c) Relative share of firms for industries in the third quartile.



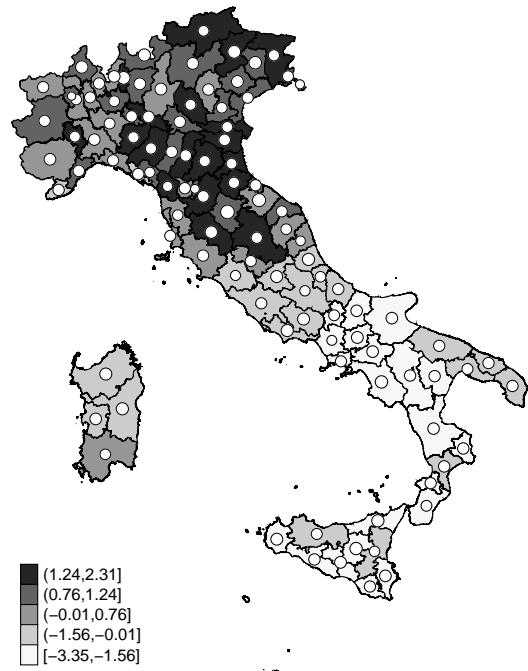
(d) Relative share of firms for industries in the fourth quartile.

Figure 5: Comparison of the provincial relative share of firms in the data set, by grouping industries in quartiles of the industry PSI distribution from UK 2001 Input-Output Use tables.

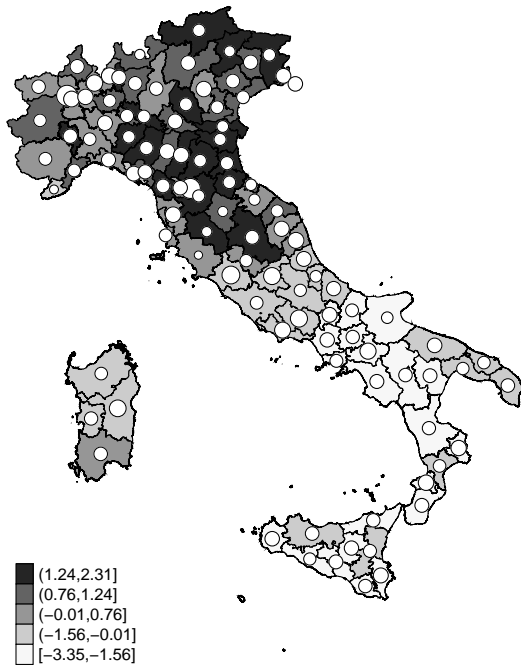




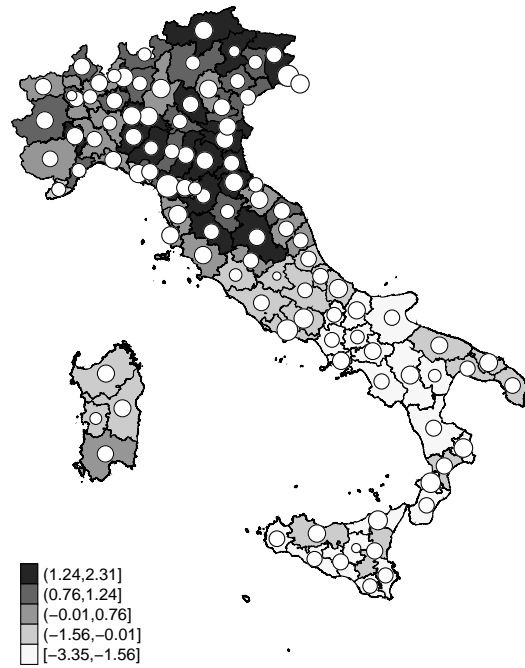
(a) Relative share of firms for industries in the first quartile.



(b) Relative share of firms for industries in the second quartile.



(c) Relative share of firms for industries in the third quartile.



(d) Relative share of firms for industries in the fourth quartile.

Figure 6: Comparison of the provincial relative share of firms in the data set, by grouping industries in quartiles of the industry size distribution from Istat 2001 Business Census.

Table 1: Descriptive statistics

Variable	Obs.	Mean	S.D.	Min	Max	1st quart.	Median	3rd quart.
<i>Firm-level variables</i>								
PSI (log)	285,914	2.93	0.93	-8.16	6.07	2.37	3.03	3.58
Firm age (log)	285,914	2.15	0.98	0	5.02	1.43	2.20	2.93
Firm capital (log)	285,914	11.44	2.06	0	23.44	10.09	11.33	12.79
Firm employees (log)	285,914	1.82	1.28	0	12.20	0.83	1.71	2.60
<i>Civic capital variables</i>								
Referenda turnout (log)	103	4.39	0.11	4.13	4.52	4.30	4.42	4.47
Blood donations (log)	103	3.57	0.42	2.50	4.44	3.26	3.64	3.84
Volunteers (log)	103	8.53	0.63	7.10	10.01	8.15	8.60	8.93
Principal component	103	0	1.5	-3.35	2.31	-1.23	0.44	1.13
<i>Historical variables</i>								
Aid societies in 1873 (log)	20	4.03	0.09	3.82	4.21	3.97	4.03	4.08
Turnout in 1920s (log)	20	6.25	0.98	4.16	7.47	5.41	6.54	7.07
Number of free-city states	67	0.85	0.78	0	3	0	1	1
<i>Other explanatory variables</i>								
Upstream serv. workers (log)	721	6.68	1.42	1.67	11.02	5.69	6.78	7.58
Length of trials (log)	103	6.94	0.34	6.19	7.72	6.72	6.92	7.18
Bank branches (log)	103	1.59	0.44	-0.66	2.33	1.27	1.72	1.91
University graduates (log)	103	1.85	0.18	1.46	2.45	1.73	1.85	1.93
No. exp. prod. to East. Europe (log)	6,131	-1.83	1.80	-9.06	4.36	-3.04	-1.83	-0.60
No. exp. prod. to China (log)	6,124	-2.13	1.80	-9.06	4.13	-3.31	-2.16	-0.92

*Note:* The table provides descriptive statistics for the variables used in the regressions. The dependent variable, *PSI*, is the log of purchased service intensity, defined as the amount spent on external services provision divided by sales. *Firm age* is the log of the firm age. *Capital* is the log of the firms' capital stock, defined as total tangible fixed assets. *Employees* is the log of the number of employees. All firm-level variables are averages over the years 2001 – 2007. We consider the following variables to measure civic capital: *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Blood donations* is the log of the number of blood donations per 100,000 inhabitants in 2002; *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Principal component* is the first principal component of the above mentioned three proxies of civic capital. The historical instrumental variables are: *Turnout in 1920s* is the the log of turnout in the elections that took place in Italy in the 1920s; *Aid societies in 1873* is the log of the members of mutual aid societies per 100,000 inhabitants in 1873; *Number of free-city states* is the number of free-city states in the territory of each province in 1300. The provincial controls are the following: *Upstream service workers* is the log of upstream service workers in a given province-industry; *Length of trials* is the log of the average number of days it takes to complete a first-degree trial in civil affairs; *Bank branches* is the log of the number of bank branches per 1000 inhabitants; *University graduates* is the log of the share of university graduates over total population; *Number of exported products to Eastern Europe* is the log of the apportioned number of exported products (HS6 classification) to Eastern Europe by province-industry; *Number of exported products to China* is the log of the apportioned number of exported products (HS6 classification) to China by province-industry.

Table 2: Highest and lowest industry coefficient of variation in PSI from AIDA

<i>Top-five 2-digit industries</i>	<i>NACE codes</i>	<i>Coefficient of variation</i>
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	52	1.11
Fishing, fish farming and related service activities	5	0.99
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	50	0.96
Agriculture, hunting and related service activities	1	0.93
Wholesale trade and commission trade, except of motor vehicles and motorcycles	51	0.88
<i>Bottom-five 2-digit industries</i>		
Insurance and pension funding, except compulsory social security	66	0.32
Activities auxiliary to financial intermediation	67	0.38
Collection, purification and distribution of water	41	0.43
Air transport	62	0.49
Research and development	73	0.50

*Note:* The table shows the industry coefficient of variation of PSI for the top-five and bottom-five 2-digit industries. We exclude firms with PSI larger than 100 percentage points.

Table 3: Baseline results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat
Referenda turnout (log)	0.528** (2.359)		0.551** (2.411)		0.531* (2.219)		0.468*** (3.512)		0.492*** (3.284)	
Principal component		0.041** (2.882)		0.042** (2.856)		0.044** (2.834)		0.023* (2.212)		0.022* (2.102)
Firm age (log)			-0.023*** (-9.039)	-0.023*** (-9.055)	-0.013*** (-4.977)	-0.013*** (-4.970)	-0.013*** (-5.316)	-0.013*** (-5.295)	-0.013*** (-5.322)	-0.013*** (-5.343)
Firm capital (log)			0.020*** (4.564)	0.020*** (4.561)	0.042*** (10.155)	0.042*** (10.253)	0.043*** (10.496)	0.043*** (10.490)	0.043*** (10.462)	0.043*** (10.454)
Firm employees (log)					-0.069*** (-18.424)	-0.069*** (-18.450)	-0.070*** (-18.376)	-0.071*** (-18.328)	-0.070*** (-18.316)	-0.071*** (-18.278)
Upstream serv. workers (log)							0.046*** (9.973)	0.044*** (9.080)	0.049*** (6.862)	0.044*** (6.646)
Length of trials (log)									-0.000 (-0.013)	0.006 (0.289)
Bank branches (log)									0.004 (0.713)	0.001 (0.180)
University graduates (log)									-0.021 (-0.513)	0.000 (0.012)
$R^2$	0.343	0.343	0.344	0.344	0.349	0.350	0.352	0.351	0.352	0.351
Obs.	285,943	285,943	285,924	285,924	285,924	285,924	285,914	285,914	285,914	285,914
Moran's $I$	-0.038	-0.024	-0.031	-0.016	-0.028	-0.014	-0.078	-0.056	-0.075	-0.056
Moran's $p$ -value	0.31	0.40	0.36	0.45	0.38	0.47	0.12	0.22	0.13	0.21
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* We report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. We use the following variables to measure civic capital: *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Principal component* is the first principal component of the three proxies of civic capital. We include the following firm-level controls: *Firm age* is the log of the firm age; *Firm capital* is the log of the firms' capital stock, defined as total tangible fixed assets; *Firm employees* is the log of the total number of employees. We include the following provincial controls: *Upstream service workers* is the log of upstream service workers in a given province-industry; *Length of trials* is the log of the number of days it takes to complete a first-degree trial in labor-related affairs; *Bank branches* is the log of the number of bank branches per 1,000 inhabitants; *University graduates* is the log of the share of university graduates over total population.

Table 4: Industry heterogeneity: Interaction with industry coefficient of variation in PSI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat
Ref. turnout (log) * $CV^{aid}$ 2-d	1.149*** (5.245)							
Princ. component * $CV^{aid}$ 2-d		0.101*** (6.367)						
Ref. turnout (log) * $CV^{aid}$ 3-d			1.214*** (5.596)					
Princ. component * $CV^{aid}$ 3-d				0.107*** (6.952)				
Ref. turnout (log) * $CV^{fib}$ 2-d					0.817** (2.888)			
Princ. component * $CV^{fib}$ 2-d						0.072** (4.026)		
Ref. turnout (log) * $CV^{fib}$ 3-d							0.556 (2.055)	
Princ. component * $CV^{fib}$ 3-d								0.053** (3.278)
Upstream serv. workers (log)	0.084*** (2.915)	0.077*** (2.608)	0.087*** (2.957)	0.080*** (2.665)	0.075** (2.153)	0.071* (2.010)	0.087* (2.177)	0.086* (2.124)
Upstream serv. workers (log) * $CV^{aid}$ 2-d	0.027 (0.567)	0.032 (0.852)						
Upstream serv. workers (log) * $CV^{aid}$ 3-d			0.023 (0.451)	0.028 (0.716)				
Upstream serv. workers (log) * $CV^{fib}$ 2-d					0.039 (1.222)	0.042 (1.676)		
Upstream serv. workers (log) * $CV^{fib}$ 3-d							0.033 (1.512)	0.035 (2.046)
$R^2$	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
Obs.	285,914	285,914	285,913	285,913	285,914	285,914	282,334	282,334
Moran's $I$	-0.042	0.083	0.098	0.111	-0.021	-0.035	0.013	0.082
Moran's $p$ -value	0.29	0.06	0.03	0.02	0.42	0.33	0.35	0.06
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* We report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. We use the following variables to measure civic capital: *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Principal component* is the first principal component of the three proxies of civic capital. We include the following provincial control: *Upstream service workers* is the log of upstream service workers in a given province-industry. Each provincial variable is interacted with the industry coefficients of variation,  $CV^{aid}$  from AIDA or  $CV^{fib}$  from FIBEN, defined at the 2-digit or 3-digit level. All columns include dummies for each province.

Table 5: Robustness checks

	(1) Squared var. Coef./t-stat	(2) No TO,MI,RM Coef./t-stat	(3) Manuf., Exp. East Europe Coef./t-stat	(4) Manuf., Exp. East Europe Coef./t-stat	(5) Manuf., Exp. China Coef./t-stat	(6) Services Coef./t-stat	(7) No largest firms Coef./t-stat	(8) PSI < 100 pct. Coef./t-stat
Principal component	0.023* (2.206)	0.029** (2.772)	0.013 (1.335)	0.018* (1.999)	0.018* (1.996)	0.023* (2.119)	0.022* (2.059)	0.023* (2.179)
Firm employees (log)	-0.125*** (-19.044)	-0.076*** (-27.701)	-0.042*** (-10.184)	-0.045*** (-11.186)	-0.045*** (-11.195)	-0.080*** (-14.668)	-0.075*** (-18.308)	-0.065*** (-17.567)
Firm employees (log), squared	0.013*** (14.989)							
Firm capital (log)	0.094*** (11.194)	0.048*** (13.869)	0.033*** (9.772)	0.033*** (9.922)	0.033*** (9.923)	0.041*** (9.678)	0.044*** (10.906)	0.042*** (10.400)
Firm capital (log), squared	-0.002*** (-6.434)							
Firm age (log)	-0.005 (-0.530)	-0.011*** (-3.947)	-0.007* (-1.982)	-0.007** (-2.087)	-0.007** (-2.036)	-0.012*** (-3.622)	-0.014*** (-4.440)	-0.011*** (-4.740)
Firm age (log), squared	-0.002 (-0.751)							
Upstream serv. workers (log)	0.043*** (8.871)	0.057*** (8.548)	0.017*** (3.420)	-0.004 (-0.747)	-0.004 (-0.821)	0.052*** (10.941)	0.044*** (8.870)	0.043*** (9.041)
Exp. products to East Europe (log)				0.032*** (6.191)				
Exp. products to China (log)					0.032*** (6.357)			
$R^2$	0.352	0.354	0.181	0.183	0.183	0.387	0.353	0.355
Obs.	285,914	216,026	77,860	77,860	77,845	198,280	260,125	282,908
Moran's $I$	-0.056	-0.074	-0.100	-0.134	-0.135	-0.042	-0.068	-0.049
Moran's $p$ -value	0.21	0.14	0.06	0.02	0.02	0.29	0.16	0.25
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* We report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. To measure civic capital we use *Principal component*, the first principal component of the three proxies of civic capital. We include the following firm-level controls (both in levels and squared): *Firm age* is the log of the firm age; *Firm capital* is the log of the firms' capital stock, defined as total tangible fixed assets; *Firm employees* is the log of the total number of employees. We include the following controls varying by province-industry: *Upstream service workers* is the log of upstream service workers; *Exp. products to East Europe* is the log of the apportioned number of exported products to Eastern Europe; *Exp. products to China* is the log of the apportioned number of exported products to China.

Table 6: 2SLS with external historical instruments

Panel A: Second Stage (Dependent variable: Log of PSI)						
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS (no South)	2SLS Turn. 1920s	2SLS Aid soc.	2SLS Both	2SLS Free-city
	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat
Principal component	0.072*** (8.266)	0.087*** (9.203)	0.090*** (6.539)	0.079*** (5.172)	0.086*** (6.561)	0.097*** (5.916)
Firm age (log)	-0.013*** (-4.853)	-0.018*** (-9.523)	-0.013*** (-5.034)	-0.013*** (-4.961)	-0.013*** (-5.008)	-0.018*** (-9.814)
Firm capital (log)	0.043*** (10.400)	0.031*** (10.179)	0.043*** (10.465)	0.043*** (10.444)	0.043*** (10.457)	0.031*** (10.251)
Firm employees (log)	-0.071*** (-18.073)	-0.069*** (-15.841)	-0.071*** (-18.249)	-0.071*** (-18.275)	-0.071*** (-18.260)	-0.069*** (-16.000)
Upstream serv. workers (log)	0.027*** (5.881)	0.026*** (5.890)	0.028*** (5.775)	0.027*** (5.859)	0.028*** (5.878)	0.026*** (5.806)
$R^2$	0.350	0.330	0.350	0.350	0.350	0.330
Obs.	285,917	221,882	285,917	285,917	285,917	221,882
Moran's $I$	0.064	0.093	0.043	0.053	0.046	0.058
Moran's $p$ -value	0.11	0.06	0.18	0.14	0.17	0.15
3-digit dummies	Yes	Yes	No	Yes	Yes	Yes
Macro-regional dummies	Yes	Yes	No	Yes	Yes	Yes
Panel B: First Stage (Dependent variable: Principal component)						
Turnout 1920s (log)			6.447*** (5.441)		4.773*** (3.399)	
Mutual aid societies (log)				1.155*** (5.308)	0.652*** (2.702)	
1 free-city in 1300						0.657*** (2.900)
2 free-city in 1300						1.069*** (5.365)
3 free-city in 1300						0.260 (0.977)
Upstream service workers (log)			-0.114 (-1.426)	-0.066 (-0.737)	-0.094 (-1.221)	-0.031 (-0.443)
$F$ -stat of excluded instr.			29.61	28.18	22.53	10.07
$F$ -stat $p$ -value			0.00	0.00	0.00	0.00
3-digit dummies			Yes	Yes	Yes	Yes
Macro-regional dummies			Yes	Yes	Yes	Yes
Firm-level covariates			Yes	Yes	Yes	Yes

*Note:* In Panel A we report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. In Panel B we report in parentheses non-bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively. In the first stage we use two sets of instrumental variables. The first set of instrumental variables are: *Mutual aid societies in 1873* is the log of the members of mutual aid societies per 100,000 inhabitants in 1873; *Turnout in 1920s* is the log of turnout in the elections that took place in Italy in the 1920s. The second set of instrumental variables are dummies for the number of free-city states at the provincial level in 1300.



Table B-1: Industry heterogeneity: Interaction with industry coefficient of variation in PSI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat	Coef/t-stat
Ref. turnout (log) * $CV^{aid}$ 2-d	1.041*** (5.724)							
Princ. component * $CV^{aid}$ 2-d		0.091*** (6.858)						
Ref. turnout (log) * $CV^{aid}$ 3-d			1.016*** (5.610)					
Princ. component * $CV^{aid}$ 3-d				0.089*** (7.049)				
Ref. turnout (log) * $CV^{fib}$ 2-d					0.473 (1.788)			
Princ. component * $CV^{fib}$ 2-d						0.046* (2.816)		
Ref. turnout (log) * $CV^{fib}$ 3-d							0.166 (0.626)	
Princ. component * $CV^{fib}$ 3-d								0.022 (1.392)
Upstream serv. workers (log)	0.080*** (2.796)	0.072** (2.325)	0.091*** (3.045)	0.083*** (2.598)	0.078* (2.035)	0.075* (1.944)	0.091* (2.101)	0.090* (2.085)
Upstream serv. workers (log) * $CV^{aid}$ 2-d	0.032 (0.784)	0.036 (1.152)						
Upstream serv. workers (log) * $CV^{aid}$ 3-d			0.018 (0.440)	0.022 (0.716)				
Upstream serv. workers (log) * $CV^{fib}$ 2-d					0.037 (1.524)	0.039 (1.928)		
Upstream serv. workers (log) * $CV^{fib}$ 3-d							0.029 (1.592)	0.029 (1.840)
$R^2$	0.354	0.354	0.354	0.354	0.353	0.353	0.354	0.354
Obs.	285,914	285,914	285,913	285,913	285,914	285,914	282,334	282,334
Moran's $I$	-0.029	-0.026	-0.013	0.141	-0.065	0.025	0.059	-0.179
Moran's $p$ -value	0.37	0.39	0.48	0.01	0.17	0.28	0.12	0.00
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* We report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. We use the following variables to measure civic capital: *Referenda turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Principal component* is the first principal component of the three proxies of civic capital. We include the following provincial control: *Upstream service workers* is the log of upstream service workers in a given province-industry. Each provincial variable is interacted with the industry coefficients of variation,  $CV^{aid}$  from AIDA or  $CV^{fib}$  from FIBEN, defined at the 2-digit or 3-digit level. All columns include dummies for each province.



Table B-2: Robustness checks with referenda turnout as main regressor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Squared var. Coef./t-stat	No TO,MI,RM Coef./t-stat	Manuf., Exp. East Europe Coef./t-stat	Manuf., Exp. East Europe Coef./t-stat	Manuf., Exp. China Coef./t-stat	Services Coef./t-stat	No largest firms Coef./t-stat	PSI < 100 pct. Coef./t-stat
Referenda turnout (log)	0.468*** (3.523)	0.456*** (3.542)	0.435*** (3.280)	0.460*** (3.331)	0.456*** (3.297)	0.392** (2.998)	0.425*** (3.173)	0.455*** (3.502)
Firm employees (log)	-0.125*** (-19.013)	-0.076*** (-27.640)	-0.042*** (-10.125)	-0.045*** (-11.122)	-0.045*** (-11.132)	-0.080*** (-14.671)	-0.075*** (-18.317)	-0.065*** (-17.607)
Firm employees (log), squared	0.013*** (14.960)							
Firm capital (log)	0.094*** (11.229)	0.048*** (13.920)	0.033*** (9.807)	0.033*** (9.955)	0.033*** (9.956)	0.042*** (9.678)	0.044*** (10.910)	0.042*** (10.406)
Firm capital (log), squared	-0.002*** (-6.453)							
Firm age (log)	-0.005 (-0.535)	-0.011*** (-3.951)	-0.007** (-2.060)	-0.008** (-2.162)	-0.008** (-2.111)	-0.012*** (-3.615)	-0.014*** (-4.461)	-0.011*** (-4.753)
Firm age (log), squared	-0.002 (-0.761)							
Upstream serv. workers (log)	0.045*** (9.739)	0.058*** (9.261)	0.018*** (3.527)	-0.003 (-0.455)	-0.003 (-0.526)	0.054*** (12.180)	0.045*** (9.672)	0.045*** (9.930)
Exp. products to East Europe (log)				0.032*** (6.126)				
Exp. products to China (log)					0.032*** (6.293)			
$R^2$	0.352	0.354	0.181	0.183	0.183	0.387	0.353	0.355
Obs.	285,914	216,026	77,860	77,860	77,845	198,280	260,125	282,908
Moran's $I$	-0.078	-0.106	-0.099	-0.144	-0.144	-0.062	-0.089	-0.067
Moran's $p$ -value	0.12	0.05	0.07	0.01	0.01	0.19	0.09	0.16
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* We report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. To measure civic capital we use *Referendum turnout*, the log of the average electoral turnout in referenda between 1946 and 1987. We include the following firm-level controls: *Employees* is the log of the total number of employees; *Capital* is the log of the firms' capital stock, defined as total tangible fixed assets; *Firm age* is the log of the firm age. We include the following controls varying by province-industry: *Upstream service workers* is the log of upstream service workers; *Exp. products to East Europe* is the log of the imputed number of exported products to Eastern Europe; *Exp. products to China* is the log of the imputed number of exported products to China.

Table B-3: 2SLS with external historical instruments (turnout 1920s, mutual societies) for robustness checks

Panel A: Second stage (Dependent variable: Log of PSI)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	Squared var. Coef./t-stat	No TO,MI,RM Coef./t-stat	Manuf. Coef./t-stat	Manuf., Exp. East Europe Coef./t-stat	Manuf., Exp. China Coef./t-stat	Services Coef./t-stat	No largest firms Coef./t-stat	PSI < 100 pct. Coef./t-stat	
Principal component	0.085*** (6.543)	0.083*** (5.409)	0.085*** (4.937)	0.078*** (4.628)	0.078*** (4.627)	0.083*** (6.588)	0.089*** (6.791)	0.088*** (6.570)	
Firm age (log)	-0.005 (-0.621)	-0.011*** (-3.613)	-0.007* (-1.867)	-0.007* (-1.931)	-0.007* (-1.878)	-0.012*** (-3.504)	-0.014*** (-4.251)	-0.011*** (-4.487)	
Firm capital (log)	0.096*** (11.326)	0.048*** (13.704)	0.033*** (9.750)	0.033*** (9.889)	0.033*** (9.888)	0.042*** (9.714)	0.044*** (10.900)	0.042*** (10.406)	
Firm employees (log)	-0.126*** (-18.708)	-0.077*** (-27.451)	-0.043*** (-10.084)	-0.045*** (-11.187)	-0.045*** (-11.200)	-0.080*** (-14.769)	-0.075*** (-17.988)	-0.065*** (-17.384)	
Upstream serv. workers (log)	0.027*** (5.683)	0.046*** (5.744)	0.001 (0.129)	-0.019 (-2.835)	-0.020 (-2.892)	0.036*** (8.052)	0.028*** (5.522)	0.027*** (5.611)	
Firm employees (log), squared	0.013*** (14.606)								
Firm capital (log), squared	-0.002*** (-6.695)								
Firm age (log), squared	-0.001 (-0.639)								
Exp. products to East Europe (log)				0.032*** (6.092)					
Exp. products to China (log)					0.033*** (6.232)				
$R^2$	0.351	0.352	0.177	0.180	0.180	0.386	0.351	0.353	
Obs.	285,914	216,026	77,860	77,860	77,845	198,280	260,125	282,908	
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Macro-regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Panel B: First stage (Dependent variable: Principal component)									
Turnout 1920s (log)	4.772*** (3.399)	4.239*** (2.874)	3.560*** (3.010)	3.562*** (3.018)	3.562*** (3.018)	5.225*** (3.589)	4.809*** (3.385)	4.760*** (3.396)	
Mutual Societies (log)	0.652*** (2.702)	0.548* (1.921)	0.748*** (3.251)	0.742*** (3.240)	0.742*** (3.240)	0.605*** (2.431)	0.654*** (2.689)	0.653*** (2.709)	
Upstream service workers (log)	-0.094 (-1.221)	-0.181 (-1.177)	-0.037 (-0.425)	-0.046 (-0.508)	-0.046 (-0.508)	-0.108 (-1.489)	-0.098 (-1.266)	-0.094 (-1.216)	
Exp. products to East Europe (log)				0.014 (0.703)					
Exp. products to China (log)					0.014 (0.710)				
$F$ -stat of excluded instr.	22.53	15.51	21.39	21.28	21.28	22.61	22.57	22.53	
$F$ -stat $p$ -value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Macro-regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Firm-level covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

*Note:* In Panel A we report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. In Panel B we report in parentheses non-bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively. In the first stage we use as instrumental variables: *Mutual aid societies in 1873* is the log of the members of mutual aid societies per 100,000 inhabitants in 1873; *Turnout in 1920s* is the log of turnout in the elections that took place in Italy in the 1920s.

Table B-4: 2SLS with external historical instruments (free-city states) for robustness checks

	Panel A: Second stage (Dependent variable: Log of PSI)							
	(1) Squared var. Coef./t-stat	(2) No TO.MI, RM Coef./t-stat	(3) Manuf. Coef./t-stat	(4) Manuf., Exp. East Europe Coef./t-stat	(5) Manuf., Exp. China Coef./t-stat	(6) Services Coef./t-stat	(7) No largest firms Coef./t-stat	(8) PSI < 100 pct. Coef./t-stat
Principal component	0.099*** (5.717)	0.092** (3.160)	0.070** (2.576)	0.062** (2.520)	0.062** (2.528)	0.108*** (5.822)	0.108*** (5.822)	0.102*** (5.648)
Firm age (log)	-0.005 (-0.580)	-0.011*** (-3.618)	-0.006* (-1.756)	-0.007* (-1.822)	-0.006* (-1.770)	-0.012*** (-3.659)	-0.014*** (-4.431)	-0.011*** (-4.639)
Firm capital (log)	0.096*** (11.369)	0.048*** (13.739)	0.033*** (9.570)	0.033*** (9.699)	0.033*** (9.699)	0.041*** (9.750)	0.044*** (10.939)	0.042*** (10.444)
Firm employees (log)	-0.126*** (-18.761)	-0.077*** (-27.437)	-0.042*** (-10.224)	-0.045*** (-11.299)	-0.045*** (-11.310)	-0.080*** (-14.814)	-0.075*** (-18.046)	-0.065*** (-17.444)
Upstream serv. workers (log)	0.028*** (4.957)	0.047*** (5.057)	0.000 (0.058)	-0.020* (-3.020)	-0.021* (-3.077)	0.030*** (6.738)	0.039*** (4.607)	0.029*** (4.875)
Firm employees (log), squared	0.013*** (14.567)							
Firm capital (log), squared	-0.002*** (-6.684)							
Firm age (log), squared	-0.001 (-0.692)							
Exp. products to Eastern Europe (log)				0.033*** (6.127)				
Exp. products to China (log)				0.033*** (6.262)				
$R^2$	0.350	0.352	0.177	0.180	0.180	0.386	0.351	0.352
Obs.	285,914	216,026	77,860	77,860	77,845	198,280	260,125	282,908
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro-regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: First stage (Dependent variable: Principal component)								
1 free-city in 1300	0.668*** (3.136)	0.443* (1.906)	0.517*** (2.600)	0.511*** (2.595)	0.511*** (2.595)	0.711*** (3.168)	0.683*** (3.226)	0.667*** (3.131)
2 free-city in 1300	1.015*** (4.985)	0.736*** (3.159)	0.858*** (4.156)	0.855*** (4.159)	0.855*** (4.156)	1.058*** (5.150)	1.015*** (4.984)	1.014*** (4.978)
3 free-city in 1300	0.259 (0.941)	-0.179 (-0.877)	0.132 (0.508)	0.127 (0.495)	0.127 (0.494)	0.299 (1.057)	0.281 (1.020)	0.258 (0.937)
Upstream service workers (log)	-0.079 (-1.004)	-0.180 (-0.962)	-0.046 (-0.511)	-0.062 (-0.672)	-0.062 (-0.672)	-0.083 (-1.088)	-0.083 (-1.039)	-0.079 (-0.999)
Exp. products to Eastern Europe (log)				0.027 (1.172)				
Exp. products to China (log)				0.027 (1.170)				
F-stat of excluded instr.	8.74	8.01	6.41	6.45	6.44	9.23	8.80	8.71
F-stat $p$ -value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-digit dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro-regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note:* In Panel A we report in parentheses the bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively, for the corresponding two-tailed test. In Panel B we report in parentheses non-bootstrap  $t$  statistic which is robust to clustering at the province level. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively. In the first stage we use as instrumental variables: *Mutual aid societies in 1873* is the log of the members of mutual aid societies per 100,000 inhabitants in 1873; *Turnout in 1920s* is the log of turnout in the elections that took place in Italy in the 1920s.