

Buerker, Matthias; Minerva, Gaetano Alfredo

**Conference Paper**

## Civic Capital and the Vertical Integration of Service Provision: Evidence from Italy

53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy", 27-31 August 2013, Palermo, Italy

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Buerker, Matthias; Minerva, Gaetano Alfredo (2013) : Civic Capital and the Vertical Integration of Service Provision: Evidence from Italy, 53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy", 27-31 August 2013, Palermo, Italy, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/124137>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Civic Capital and the Vertical Integration of Service Provision: Evidence from Italy \*

Matthias Bürker<sup>†</sup> and G. Alfredo Minerva<sup>‡</sup>

January 14, 2012

## Abstract

This paper studies whether civic capital acts an effective restraint against opportunistic behavior in transactions, looking at the degree of outsourcing to external suppliers of service provision in Italian firms. Our results show that, on average, firms tend to outsource more services where civic capital is higher. Two qualifications apply: the firms that are more heavily influenced are the smaller ones; the effect is particularly pronounced in provinces where formal contract enforcement is more difficult. To address the issue of endogeneity we also instrument the current stock of civic capital by historical variables. We argue that the rise in the propensity to engage in transactions with outside service suppliers is evidence of a decrease in the opportunistic behavior between the parties involved in the transaction.

**JEL Classification:** Z13, L20, A13

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

---

\*We are grateful to Paolo Buonanno, Robert Putnam, and Paolo Vanin for having provided us some of the data used in this paper. We also thank for their comments Erich Battistin, Marco Casari, Maurizio Caserta, Guido de Blasio, Stefano Federico, Sauro Mocetti, Giovanni Peri, participants to the 51st Annual Meeting of the Italian Economic Association in Catania, the 2010 PRIN Workshop “The Role of Business Services for Innovation, Internationalisation and Growth” in Rome, the 4th Italian Congress of Econometrics and Empirical Economics in Pisa, the Congress “New Directions in Welfare” at OECD in Paris, and to a seminar at the University of Bologna.

<sup>†</sup>Department of Economics, University of Bologna. E-mail: matthias.burker@unibo.it

<sup>‡</sup>Corresponding author. Department of Economics, University of Bologna. E-mail: ga.minerva@unibo.it

# 1 Introduction

Since Coase (1937), production is thought to be carried out inside a firm when non-market allocation is more efficient than allocation through the market. This may occur because of the transaction costs associated to markets. Transaction Cost Economics (Williamson, 1979, 1985, 1996) provides testable predictions on whether a transaction takes place within the firm or on the market. Products which require relationship-specific investments (because they are complex or are exchanged under uncertainty) create contractual hazards between the parties when they are traded on the market. These hazards lead to ex-post opportunistic renegotiation of the contract regulating the transaction. Hence, products requiring relationship-specific investment are more likely to be exchanged within the firm. However, as Williamson (1996) points out, not only product characteristics but also the environment in which a transaction takes place determines the make-or-buy decision of firms. Specifically, he stresses the role for societal culture in determining the extent of opportunistic behavior and hence the incidence of contractual hazards.

In this paper, we empirically test the prediction from TCE that a more opportunistic environment leads to more vertical integration in the Italian context. We proxy the level of opportunism by the level of local civic capital (Putnam, 1993; Banfield, 1958) in each Italian province.<sup>1</sup> Concerning vertical integration, we focus on the purchase of a specific item, namely services. We analyze the extent to which firms produce services in-house or acquire them on the market. This information is available at the firm level. In a way quite similar to Holmes (1999), we measure vertical integration by the ratio of purchased services over sales.<sup>2</sup> The choice of using services is dictated by several reasons. First, service transactions are subject to substantial contract incompleteness, which makes the specification of a well-defined contract ex ante cumbersome. For example, quality is difficult to measure and heterogeneous which hampers the comparison of prices and outputs and makes third party enforcement difficult. Moreover, service production is characterized by moral hazard due to asymmetric information (DeBandt, 1996). Hence, according to TCE, the exchange of services is highly sensitive to contractual hazards and opportunistic behavior. Second, services are predominantly acquired on the local market (Schwartz, 1993; Ono, 2003; Merino and Rodrand, 2007).<sup>3</sup> Consequently, in service transactions both parties are located in the same local area. This is a necessary condition to identify the change in the opportunistic attitude of the parties involved in the transaction through the spatial variation of civic capital.<sup>4</sup>

---

<sup>1</sup>We adopt the terminology of Guiso et al. (2010) who propose the term *civic capital* instead of social capital. See below for a definition of civic capital and for a discussion of its measurement.

<sup>2</sup>In Holmes (1999) the degree of vertical integration is Purchased Inputs Intensity; that is, raw materials over sales. Below, we make a case for the use of services in the place of raw material.

<sup>3</sup>The Survey “Industrial and Service Firms 2007” conducted by the Bank of Italy reveals that almost 2/3 of firms acquire service inputs from within the same region in Italy.

<sup>4</sup>This is also the main reason why we prefer services instead of raw materials for the computation of the degree of vertical integration. Differently from services, raw materials are more tradeable, and hence the location of their suppliers is more uncertain.

Our analysis complements the existing literature in several ways. First, the empirical TCE literature has mainly analyzed the effect of product characteristics on vertical integration, and found overwhelming evidence in favor of TCE predictions. In particular, this literature has focused on asset specificity, risk, product complexity and uncertainty and their effect on vertical integration.<sup>5</sup> In contrast, we focus on the environment in which a transaction takes place. Our analysis is also close to (Holmes, 1999). He studies the effect of industry spatial concentration on the make-or-buy decision of manufacturing firms in the US.<sup>6</sup> He finds a positive correlation between industry concentration and purchased input intensity of raw materials. In contrast to his study, we focus on service inputs of firms from all sectors. Finally, while he works with aggregate data at the county and industry level we work with firm-level data, available at a highly disaggregated geographical and industry level (NUTS 3 spatial units and 4 digits NACE). By narrowly defining industrial activity, we are confident to hold constant product characteristics which are an important determinant of contract incompleteness.

To the best of our knowledge, we are the first to empirically assess the importance of opportunistic behavior, a behavioral assumption of TCE, for the determination of the boundaries of the firm. We find a significant effect of the level of civic capital on purchased service intensity. We then conclude that firms in environments where people are less opportunistic acquire relatively more services on the market. This effect is robust against the inclusion of both firm-level controls (number of workers, capital stock and overall value added) as well as provincial variables which are supposed to affect the firms' make-or-buy decision (size of the local service market, local GDP, the quality of local formal contract enforcement). Moreover, we find that the effect of civic capital on vertical integration is greater for smaller firms and disappears in areas with a good quality of contract enforcement. Finally, evidence from instrumental variable analysis document that the effect is not driven by omitted variables.

In order to illustrate the contractual hazards that emerge in the case of services, consider a service provider and a client which enter into a contractual relationship. In this context, asset specificity implies that the provider has to acquire specific physical or human capital to meet the specific needs of the client. Similarly, it might be that the client has to align its work setting or require specific knowledge in order to allow the provision of the service or to assist effectively the provider. In this situation, both parties may be tempted to renegotiate the contract for more favorable terms after the service has been provided by the supplier, or after the client has adapted to receive the service provision (ex post opportunism). Contractual hazards further increase due to measurement difficulties. In the case of services, it may be difficult to measure quality or simply compare it across different suppliers. Therefore, it is virtually impossible to write a contract which effectively limits the scope for opportunistic behavior: responsibilities and duties for each contracting party are hard to define, penalties for defection difficult to specify, and general clauses, which specify the adaptation to unforeseen contingencies, are therefore ineffective. Consequently, the client (provider) can

---

<sup>5</sup>See (Lafontaine and Slade, 2007) for a survey.

<sup>6</sup>For a theoretical model of agglomeration, opportunism and outsourcing see (Helsley and Strange, 2007).

unjustifiably question the objectively unverifiable quality of the service or renegotiate contracts after the providers (clients) specific investment is sunk.

Williamson (1996) stresses that not only these characteristics of the product to be exchanged have an effect on the extent of contractual hazards and hence on the boundaries of the firm, but also the environment in which the transaction is realized. More specifically, he underlines the importance of societal culture for economic organization: "The main import of *societal* culture [...] is that it serves as a check on opportunism".<sup>7</sup> In an environment which tolerates cheating, he claims, contractual hazards are emphasized by weak (or inexistent) social sanctions against opportunistic behavior.

The stock of civic capital serves as an inverse measure of opportunistic behavior in a local area. We adopt the definition proposed by Guiso et al. (2010) who define civic capital as "those persistent shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities". In other words, civic capital captures the extent to which individuals, independently of formal sanctions, cooperate even though they forgo an immediate material benefit. In areas with high civic capital, an individual expects his fellow to cooperate, who, in turn, does not defect because he feels a moral obligation not to do so.<sup>8</sup> Alternatively, the fellow might cooperate simply because he fears the proscription of opportunistic behavior by other members of the community (Coleman, 1990; Williamson, 1996).<sup>9</sup>

To sum up, high civic capital poses barriers to narrow minded opportunistic behavior which lowers the extent of contractual hazards. Consequently, in an environment where civic capital is high the provision of services is more frequently realized through an arm's length relationship, with respect to an area where civic capital is low. As a consequence, we expect purchased service intensity to be higher where civic capital is higher.<sup>10</sup>

This paper is organized as follows. Section 2 describes the data and the variables employed. In section 3 we lay out the equation to be estimated. Sections 4.1 and 4.2 provide the empirical analysis. Finally, section 5 concludes.

---

<sup>7</sup>See page 268, italics added

<sup>8</sup>Several motives have been put forward by the literature which explain this seemingly irrational behavior. Cooperative behavior signals trustworthiness and helps to establish a reputation, which is especially important for service products. However, reputation is only an imperfect protection against opportunistic behavior, as firms can strategically exploit their reputation in some circumstances (DeBandt, 1996). Nonstrategic motives for this deviation from strict self-interested behavior can be explained by pro-social attitudes such as altruism (Andreoni and Miller, 2002), inequity aversion (Fehr and Schmidt, 1999) or preferences for reciprocal fairness (Falk and Fischbacher, 2006; Camerer and Thaler, 1995).

<sup>9</sup>For empirical evidence on this neighborhood effect see (Ichino and Maggi, 2000). They show not only that misconduct in a large Italian bank is higher where civic capital is lower, but also that individuals who move from low to high social capital areas behave more cooperatively.

<sup>10</sup>An alternative argument would rely on the fact that firms can imperfectly substitute a high quality service product, for which only incomplete contracts can be written, with a low quality product, for which complete contracting is possible. See (Chen, 2000) for a formalization of this idea. Accordingly, the high (low) quality product is exchanged in areas where civic capital is high (low). Assigning to the high quality service a higher market value than the low quality service, this implies that our measure of service outsourcing is higher in areas where civic capital is higher.

## 2 Data and variables

### 2.1 Firm-level variables

The primary source of information is the firm-level dataset AIDA, administered by the Bureau van Dijk. This is a commercial dataset which provides complete balance sheet information for hundreds of thousands of Italian firms. Out of this dataset, we keep the information on sales, the number of workers, total fixed assets, value added, total amount of purchased services, as well as information about geographical localization (in terms of Italian province), industrial activity code (4-digit NACE rev. 1.1) and information on the ownership structure. We work with balance sheet data from the year 2001. Since data are collected at the firm-level, and not at the plant-level, this could be a limit of our analysis. The crucial point to stress is that, to the extent that decisions about service outsourcing are taken at the central level by the parent company, and are not decentralized to individual plants, the measurement error due to the firm-level aggregation is not an important issue. Under centralization, the degree of outsourcing of the entire firm will be decided by the managers located in the parent company, and, according to our framework, it will be affected by the level of civic capital of that province. However, even in the case of outsourcing decisions made at the individual plant level, when the plants are located in the same province of the parent company, the use of firm-level data is still adequate, since the different units are influenced by the same set of provincial regressors. The only case where firm-level data are problematic is when the decision to outsource services is decentralized at the plant level, and plants are located outside of the province of the parent company.<sup>11</sup>

Carrying out the analysis at the level of provinces (they were 103 in 2001 and correspond to NUTS 3 partitioning in terms of European classification) is motivated by the fact that this is the most detailed level of spatial disaggregation for which civic capital measures are available. Our analysis deals with the entire span of economic activity. In the AIDA data set firms are found that belong to the primary (agricultural, fishing, and mining), secondary (manufacturing), and tertiary (service) sectors. However, in our baseline analysis we drop the following industries: Education; Health and social work; Other community, social and personal service activities (2-digit industries 80, 85, 90, 92, 93). The reason for dropping these activities, characterized by a large diffusion of non-profit organizations and cooperatives, is that the decision concerning the outsourcing of services is predominantly set by managers whose behavior is not dictated by high-powered market incentives, and then it could be that outsourcing is not influenced by the riskiness of the transaction with service suppliers.<sup>12</sup>

Let us now turn to the description of the variables we employ. For each firm, the profit and loss statement contains an item where the total cost of services paid by each firm is reported.<sup>13</sup> Since items recorded in

---

<sup>11</sup>We are not the first to employ firm-level data to investigate the determinants of the degree of vertical disintegration. See Li and Lu (2009) for a paper about input outsourcing in China.

<sup>12</sup>These industries are included in the robustness checks.

<sup>13</sup>In Appendix 6 we give a detailed description of the kind of services that enter this item.

the profit and loss statement are collected for accounting purposes, the purchase of specific services is not singled out, and we have only information on the total amount spent on services. The statement also has an item with the total amount of sales. We take the ratio of these two items (total service purchases and total sales) in order to retrieve what we call Purchased Service Intensity (PSI hereafter). This is a measure of the degree of service outsourcing at the firm-level.<sup>14</sup>

We now show in which manner the PSI variable is related to value added over sales, the standard way of measuring vertical integration employed in the literature.<sup>15</sup> The ratio of value added over sales captures how much of firm production is carried out within the firm boundaries. Leaving aside the variation in inventories to simplify notation, value added can be written as

$$VA = Sales - Services - Material\ Inputs - Other\ non-financial\ non-labor\ costs \quad (1)$$

and then

$$\frac{VA}{Sales} = 1 - PSI - PII - \frac{Other\ non-financial\ non-labor\ costs}{Sales} \quad (2)$$

where PSI is Purchased Service Intensity, while PII is Purchased (Material) Inputs Intensity. Consequently, the firm's overall degree of vertical integration, measured by value added over sales, can be decomposed in three parts: PSI, which measures the contribution that the purchase of services on the market, instead of their production in-house, provides to the firm's degree of integration; PII, which measures the contribution that the purchase of material inputs on the market, instead of their production in-house, provides to the firm's degree of integration; a residual term, which is related to the decision to purchase on the market other types of inputs. For the reasons explained above, in this paper we are going to focus on the effect that civic capital exerts on firm-level vertical integration through the purchase of services only.

After removing outliers and firms with missing values, we end up with more than 93,000 firm-level observations.<sup>16</sup> Figure 1 shows the geographic variation of PSI across Italian provinces. Firms in the Center-North acquire relatively more services on the market than firms located in the South. Figure 2 shows that this geographic pattern is not driven by the spatial sorting of industries with higher average PSI in the Center-North: even after removing 4-digit industry fixed effects from PSI, service outsourcing is still higher in the Center-North of the country.<sup>17</sup>

<sup>14</sup>In order to obtain a percentage number, this ratio is multiplied by 100.

<sup>15</sup>The classical reference on this is Adelman (1955). For recent applications see Holmes (1999) and Macchiavello (2012).

<sup>16</sup>Concerning the cleaning process, we first remove firms with negative values for sales, workers, purchased services, value added and capital stock. Then, we drop the 1st percentile and the 99th percentile of the distribution of each of those variables. Lastly, the same cutting occurs for the ratio of purchased services over sales.

<sup>17</sup>Specifically, Figure 2 shows the average residuals obtained from regressing the log of PSI on the full set of 4-digit industry dummies.

## 2.2 Measurement of civic capital

We employ three variables to quantify the stock of provincial civic capital: electoral turnout in referenda, blood donations and volunteering in non-profit organizations, the latter two standardized by population.<sup>18</sup> The motivation to use them as proxies descends from the following reasoning. All three activities imply individual costs which are not compensated by any material pay-off. Moreover, legal authorities neither provide incentives nor punish these kind of activities. Rather, individuals who pursue these activities are driven by a concern for the common good, due to pro-social preferences (or social pressure), or because they feel a moral obligation. Consequently, the higher it is the share of individuals in a given province engaged in these activities, the lower it is the risk of opportunistic exploitation of contractual incompleteness during the transactions for service provision. Obviously, each of these proxies is only an imperfect measure of civic capital. In order to purge these proxies of the noise, we extract the first principal component. As expected, we find a strong common pattern in the data. The eigenvalue of the first principal component is 2.48, the associated eigenvector explains 75% of the total variance.

Figure 3 shows the geographic variation of civic capital when measured by the first principal component. The pattern reveals that the stock of civic capital is the highest in the regions in the Center-North, such as Emilia-Romagna. Moreover, the map evidences a sharp North-South divide. Comparing Figure 3 with Figure 2 reveals striking similarities. For example, net of industry fixed effects, PSI is the highest in Emilia-Romagna, the region with the highest endowment of civic capital. This visual evidence is suggestive of the fact that civic capital facilitates service outsourcing.<sup>19</sup>

In the analysis we also 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. These mostly urban associations served craftsmen and artisans as a form of insurance against economic and social calamities. These variables are available at the regional level.<sup>20</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. Lacking any dominant political power in the North, this governmental form was chosen by citizens in order to address specific needs, in particular to protect their city against foreign invaders. Hence, this type of government instilled into the population a sense of cooperation and mutual assistance which persists until today. Therefore, for each province we count the number of cities that were free-city states in the year 1300 and instrument the current stock of civic capital with this variable.<sup>21</sup>

---

<sup>18</sup>These proxies have been widely used in the literature. See for example (Guiso et al., 2004; Buonanno et al., 2009; de Blasio and Nuzzo, 2010). The reason for why we use electoral turnout in referenda rather than in normal political elections is explained in Putnam (1993), p. 93.

<sup>19</sup>Notice that in the paper we are going to exploit within-regional variation since we include regional dummy variables.

<sup>20</sup>For a detailed description consult Putnam (1993).

<sup>21</sup>Data source is Guiso et al. (2008). They show that a free-city state experience in the Middle Age leads to an increase in



## 2.3 Control variables

In the estimation we introduce appropriate control variables. First of all, we have firm-level controls. They encompass the total number of employees, capital stock (total tangible fixed assets) and value added. The first two variables aims at capturing changes in service consumption that can be driven by specific labor or capital requirements.<sup>22</sup> As identities (1) and (2) make clear, value added is negatively related to service consumption. Still, including value added as an additional regressor is useful since it takes care of the overall degree of vertical integration at the firm-level.<sup>23</sup> Moreover, we include in the robustness checks firm's age and a measure of ownership concentration.

In addition to these firm-level controls, we employ several controls related to the local area where the firm is located. The first is the size of the local service market, calculated as the total number of service workers employed in each province. Our idea is that the higher it is the size and the number of firms supplying services in a given local area, the cheaper it is to outsource services, and so the higher should be PSI. Obviously, the eventual size of the local service market is in turn affected by the propensity of firms to outsource business services. In other terms, local service market is endogenous with firm-level PSI. As in Merino and Rodrand (2007), we focus on knowledge intensive business services (KIBS) which consist of the 2-digit NACE industries 72, 73, and 74.<sup>24</sup> To have an exact measure of service employment, we take this information from the 8th Census of Industry and Services carried out by the Italian national statistic authority (ISTAT) in 2001.<sup>25</sup>

Next, we capture the size of the local market by provincial population, weighted by the relevance of final demand for the industry to which the firm belongs to. The weight is retrieved from the share of total industry output destined to final demand according to the Input-Output Use table, and is available at the 2-digit industry level. We may think to this as a 'market access effect' on the degree of vertical integration, somehow in the spirit of Grossman and Helpman (2002). Moreover, both final demand and the size of the service market control for the effect of agglomeration on contractual hazards. For example, in a buyer-supplier relationship, in agglomerated areas the threat of holding-up the contract partner is less severe, due to the high number of potential alternative buyers. See Helsley and Strange (2007) for a theoretical analysis and Joskow (1985) for some empirical evidence.

Finally, the other controls that we include at the level of each local area are the quality of formal contract—the stock of the city's current civic capital. Information is provided only for the Central and Northern part of Italy, because the free-city state experience was concentrated in this part of the country. Consequently, when we use this instrument, we drop observations for firms located in the South or in the Islands.

<sup>22</sup>For example, the larger the stock of machinery, the greater the expenditure on repair and maintenance.

<sup>23</sup>In other words, in this way we also control for the decision, which affects value added, to purchase on the market material inputs, or other non-financial non-labor inputs.

<sup>24</sup>In the robustness checks we measure the size of the local service market through the number of workers employed in all service industries.

<sup>25</sup>When a firm in the sample belongs to the service sector we subtract its size from the overall number of service workers in the local area.

ing institutions, local financial development and human capital.<sup>26</sup> The functioning of courts are important determinants of contractual hazards. Well functioning courts decrease contractual uncertainty, as they are better able to precisely specify responsibilities and duties for each contracting party in the case a conflict arises. Consequently, service outsourcing should be higher where proceedings are shorter. Performance of courts are proxied by the average number of days it takes for a civil proceeding to be completed in the tribunals located in the province.<sup>27</sup> We also include the number of bank branches. As in Benfratello et al. (2008), the number of bank branches is related to the level of financial development achieved in a given province. Financial development, in turn, may be correlated to PSI as it could promote the birth of innovative suppliers providing specialized services to downstream firms, thus increasing outsourcing. As service industries tend to be skill-intensive, another variable which can be linked to the availability of a large set of service varieties is the number of skilled workers. This variable is measured by the share of the provincial population holding a university degree.

### 3 Empirical strategy

We assess the impact of civic capital on PSI by estimating the following equation:

$$\ln PSI_{i,j,s} = \alpha_0 + \alpha_1 CC_j + \ln X_i' \bar{\beta} + \ln Z_j' \bar{\delta} + \gamma_r + \gamma_s + \epsilon_{i,j,s} \quad (3)$$

where  $\ln PSI_{i,j,s}$  is the log of purchased service intensity of firm  $i$  in province  $j$  and 4-digit industry  $s$ . Our variable of interest is  $CC_j$ , the stock of civic capital in province  $j$ .  $\ln X_i$  denominates the vector of firm level controls, while the set of controls defined at the provincial level is the vector  $\ln Z_j$ . We control for unobservables at the regional level (there are 20 regions in Italy, with each of them hosting on average 5 provinces) through a set of regional dummy variables,  $\gamma_r$ , while  $\gamma_s$  is a 4-digit industry-level effect. The error term  $\epsilon_{i,j,s}$  allows for correlation between observations in the same province and in the same 4-digit industry (two-way clustering).

In order to investigate the heterogeneity of the effect of civic capital on PSI, we run a second regression in which we interact civic capital with firm size, proxied by the total number of workers. We run the specification:

$$\ln PSI_{i,j,s} = \alpha_0 + \alpha_1 CC_j + \alpha_2 CC_j \times \ln L_i + \ln X_i' \bar{\beta} + \ln Z_j' \bar{\delta}_1 + \ln Z_j' \bar{\delta}_2 \times \ln L_i + \gamma_r + \gamma_s + \epsilon_{i,j,s}. \quad (4)$$

Notice that the interaction with firm size is repeated for each province-level control, through the terms  $\ln L_i \times \ln Z_j'$ . In this econometric model,  $\alpha_1$  captures the impact of civic capital when the log-size of the firm is zero, while  $\alpha_2$  indicates how the impact of civic capital on service outsourcing changes as firm size

<sup>26</sup>The first and the last variable are based on ISTAT data, the second one is based on the Bank of Italy data.

<sup>27</sup>In some province there is more than one tribunal. We calculate the average for each province over all courts located in the province.

goes up. The total impact of civic capital is assumed to increase (or decrease, according to the sign of  $\alpha_2$ ) in the log of size.

## 4 Results

### 4.1 OLS estimates

This section provides evidence from OLS estimates. In Table 1 we show the estimation results of equation (3). In columns from (1) to (3) we employ each proxy of civic capital separately. As expected, the coefficient suggests a positive relationship between provincial civic capital and firm-level PSI. However, the effect is significant only in the case of electoral turnout. The p-value of the F-test performed on the three proxies in column (4) takes the value 0.057, suggesting that the three variables are jointly marginally significant, and the same holds for the principal component in column (5).

[Insert Table 1 about here]

Turning to the estimates of the control variables, the number of workers is positively associated with PSI. The amount of fixed assets held, *ceteris paribus*, is also positively correlated to PSI. In both cases, the rise in service consumption could be due to demand for workers-related or capital-related services (holding constant the level of sales). We get a negative sign of value added as expected. Coherently with Ono (2003), the total number of service workers in the same province is positively correlated with PSI: a larger supply of services increases on average PSI (alternatively, it could also be the case that it is the larger demand for services to spur an increase in the average size of the local service market). A larger final demand also increases PSI.<sup>28</sup>

The effect of civic capital becomes clear-cut when we allow for heterogeneity according to firm size, as in Table 2. The results show that the effect is stronger for smaller firms. Interestingly, while the quality of contract enforcement (proxied by the length of trials in civil affairs) is not significantly related to PSI in Table 1, when we allow for heterogeneity in size results reveal a statistically significant relationship. Specifically, the positive sign of the interaction term implies that the quality of contract enforcement seems to have no effect on PSI only for large firms, while small firms tend to outsource less services to external suppliers where contract enforcement is weak. For the rest of the paper, in order to present the results in a more compact way, we use the principal component as the sole measurement of civic capital.

[Table 2 about here]

Next, we perform sensitivity analysis. Specifically, in column (1) - (4) of Table 3 we split the sample into manufacturing and service sector firms. The idea is to understand whether the effect of civic capital

---

<sup>28</sup>In Grossman and Helpman (2002), under increasing returns to matching, an equilibrium with pervasive outsourcing is more likely the larger it is the expenditure of consumers.

on PSI is present in different subsets of economic activity. Columns (1) and (2) show the results for the manufacturing sector. It is interesting to observe that the effect is statistically significant only when we allow for heterogeneity according to size. The magnitude of the effect is roughly unchanged. Columns (3) and (4) exhibit the results for firms in the service sector. The effect is more pronounced in this case, and reveals that civic capital exerts a stronger effect in the case of service firms.

[Table 3 about here]

In the last two columns we split the sample according to the quality of contract enforcement. In principle, formal contract enforcement and civic capital are substitutes, as they both decrease the incidence of contractual hazards. As a consequence, we expect the effect of civic capital to be more pronounced in areas where contract enforcement is weak. This reasoning is confirmed in the data. In column (5) we have included only those firms located in provinces whose quality of contract enforcement is better than the median, that is were the number of days necessary to end a civil trial is lower than the medium value. In these provinces, civic capital has no effect at all on PSI. Conversely, the effect is statistically different from zero in provinces with a low quality of contract enforcement, as shown in the last column.

In Table 4 we run other robustness checks. In columns (1) and (2) we include additional firm level controls. These include firm age and its square, as well as an indicator of the shareholder structure. One reason for introducing age as a control is that older firms are likely to have better knowledge of reliable service providers, which could introduce a positive relationship between age and PSI. The indicator about ownership structure captures the extent to which firm ownership is dispersed among several different shareholders. Specifically, we add eight different dummies, depending on the number of shareholders, which are aimed at identifying the different propensity to service outsourcing according to ownership diversification. Dummies are ordered from the lowest degree of diversification to the highest. The higher the rank of the dummy, the more concentrated it is the ownership of the firm. If the shares are concentrated, the firm is likely to be part of a business group, which in turn could increase PSI. In columns (1) and (2) we report the estimates for the only two categories of ownership diversification that turn to be statistically significant. As expected, the firms with stronger ownership concentration (with respect to the baseline category which is omitted) tend to outsource more services to external firms.<sup>29</sup>

[Table 4 about here]

In columns (3) and (4) the measure of the size of the local service market includes workers employed in all service industries (not only industries 72, 73, and 74).

In columns (5) and (6) we include also observations pertaining to firms operating in industries where there is a strong government intervention (Education; Health and social work; Other community, social and personal service activities). This barely affects our results. Finally, in the last two columns we exclude

---

<sup>29</sup>The estimates of the other dummies are always positive, although they are not different from zero.

provinces which host large cities, in particular the provinces of Rome, Milan and Turin. Results remain unchanged. If anything, we observe a slight increase in the effect.

## 4.2 2SLS estimates

In order to exclude that our results are driven by omitted variables or by reversed causality, we perform instrumental variable analysis (two-stage least squares) in which we instrument the current stock of civic capital by historical values. In doing so, we follow the same approach we have employed in Bürker and Minerva (2011). Table 5 shows the two-stage least squares (2SLS) results. In order to provide OLS estimations comparable to the 2SLS results, in columns (1) and (2) we have estimated equations (3) and (4), replacing the regional dummies  $\gamma_r$  with macro region dummies.<sup>30</sup> This is necessary, as our historical information on civic capital, members in mutual aid societies and electoral turnout in the 1920 is available only at the regional level.

Columns (3) and (4) show the results when we use these two variables as instruments (in the table we do not report the full set of variables to save on space). The two columns are 2SLS counterparts of equations (3) and (4). Consider first column (3) in which we do not assume heterogeneity according to firm size. The first stage, shown in Panel B1, confirms the persistence of civic capital, as our instrument has a positive and significant effect on the stock of contemporaneous civic capital. Moreover, the exogenous variables explain a high share of the total variation in civic capital. The second stage results depicted in Panel A are qualitatively similar to the OLS results in that civic capital has a positive impact on PSI. The magnitude of the effect is substantially higher than in the case of OLS.

In column (4) we allow for heterogeneity in the effect of civic capital according to size. Specifically, we have interacted both historical variables with firm size to instrument the interaction. Panel B1 and B2 again exhibit a strong relationship between instruments and instrumented variables. In the case of the interaction effect, shown in Panel B2, we have that the interaction of both turnout and members in mutual aid societies are significantly correlated with their current counterpart. Our set of instruments moreover explains a large share of the variation in the instrumented variable. For both instrumented variables, the F-statistics reveals that the instruments are jointly very significant. The corresponding second stage results are shown in Panel A. They are in line with the OLS results. The interaction term is identical in terms of magnitude to the OLS interaction, the main effect displays a slight increase.

Finally, in the last column we use information on the free-city experience as instrument. Panel B1 shows that a free-city state experience in a province in 1300 increases significantly the stock of civic capital compared to provinces without free-cities. The increase in the current stock of civic capital is larger if the province hosted two free-city states in the Middle-Age, instead of just one. The exogenous variables in this specification explain two thirds of the total variation in current civic capital and the three dummies are

---

<sup>30</sup>This set of geographic controls consists of five areas: North West, North East, Center, South and Islands.

jointly very significant. Again, the second stage results suggest a truly causal impact of civic capital on service outsourcing. Interestingly, in this case the estimates are slightly smaller in magnitude than in the OLS case. So this last exercise seems to suggest that OLS estimates are slightly upward biased.

## 5 Conclusion

The focus of this paper has been to analyze the empirical relationship between the incidence of opportunism at the local level and the pattern of vertical integration of firms in the specific case of service provision. TCE predicts that contractual hazards due to asset specificity, complexity or uncertainty are further exacerbated when the exchange takes place in an environment where opportunistic behavior is widespread. In such an environment, more transactions take place within firms than in an arm's length relationship, *ceteris paribus*. To identify the effect of opportunism, we exploit the strong variation of civic capital in Italian provinces. By definition, high civic capital allows individuals to overcome free rider problems in groups, hence agents are more likely to forgo immediate material gains in favor of socially beneficial outcomes, in our case the fair realization of transactions. Consequently, high civic capital is associated with low opportunistic behavior and therefore low contract incompleteness.

Civic capital is measured at the provincial level and gauged by electoral turnout in referenda, volunteering and blood donation. The extent of service outsourcing is measured by purchased service intensity, the share of the amount spent on services over total sales. As predicted by the transaction costs literature, civic capital turns out to be an effective safeguard against contractual hazards. This effect is robust against the inclusion of various firm-level covariates, such as firm size in terms of employees, capital stock and value added, and province level controls, including quality of contract enforcement, the size of the service market, overall market size and financial development. Moreover, we find that the effect of social capital on PSI depends on firm size. In particular, smaller firms are more sensitive to the stock of civic capital. Instrumenting the current stock of civic capital with historical values reveals that our results are not driven by omitted variables or reversed causation.

## 6 Appendix

### 6.1 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: Electricity, telephone, fax, water, gas, and other utilities - 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. 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 collaterals.)

## References

- Adelman, M., 1955: Concept and Statistical Measurement of Vertical Integration. In *Business Concentration and Price Policy*. Princeton University Press, Princeton NJ.
- Andreoni, J. and J. Miller, 2002: Giving according to garp: An experimental test of the consistency of preferences for altruism. *Econometrica*, **70**(2), 737–753.
- Banfield, E., 1958: *The Moral Basis of a Backward Society*. New York: Free Press, New York.
- Benfratello, L., F. Schiantarelli, and A. Sembenelli, 2008: Banks and innovation: Microeconomic evidence on Italian firms. *Journal of Financial Economics*, **90**(2), 197–217.
- Bürker, M. and G. A. Minerva, 2011: Explaining the Size Distribution of Plants: An Approach Based on Civic Capital. Working paper 755, Dipartimento di Scienze Economiche, Università di Bologna.
- Buonanno, P., D. Montolio, and P. Vanin, 2009: Does Social Capital Reduce Crime? *Journal of Law & Economics*, **52**(1), 145–170.
- Camerer, C. and R. Thaler, 1995: Ultimatums, Dictators, and Manners. *Journal of Economic Perspectives*, **9**(2), 209–219.
- Chen, Y., 2000: Promises, Trust, and Contracts. *Journal of Law, Economics and Organization*, **16**(1), 209–32.
- Coase, R., 1937: The Nature of the Firm. *Economica*, **4**, pp. 386–405.
- Coleman, J., 1990: *Foundations of Social Theory*. Cambridge, MA: Harvard University Press, New York.
- de Blasio, G. and G. Nuzzo, 2010: Historical traditions of civicness 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.
- Falk, A. and U. Fischbacher, 2006: A theory of reciprocity. *Games and Economic Behavior*, **54**(2), 293–315.
- Fehr, E. and K. Schmidt, 1999: A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, **114**(3), 817–868.
- 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, 2010: Civic Capital as the Missing Link. (15845).
- 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.
- Ichino, A. and G. Maggi, 2000: Work Environment and Individual Background: Explaining Regional Shirking Differentials in a Large Italian Firm. *The Quarterly Journal of Economics*, **115**(3), 1057–1090.
- Joskow, P. L., 1985: Vertical Integration and Long-term Contracts: The Case of Coal-burning Electric Generating Plants. *Journal of Law, Economics and Organization*, **1**(1), 33–80.
- 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* forthcoming.
- 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.
- Putnam, R., 1993: *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.
- 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.
- 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*.
- Williamson, O. E., 1996: *The Mechanisms of Governance*. Oxford University Press, New York.

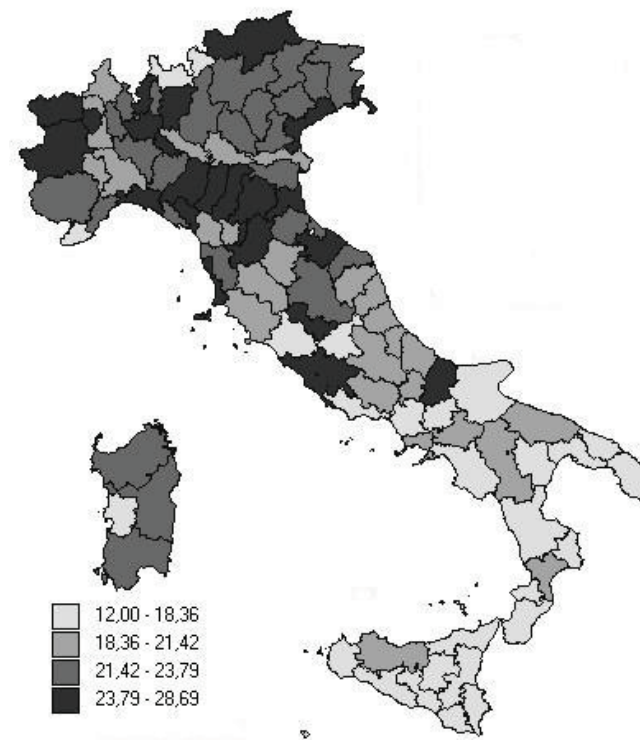


Figure 1: Purchased Service Intensity (provincial averages).

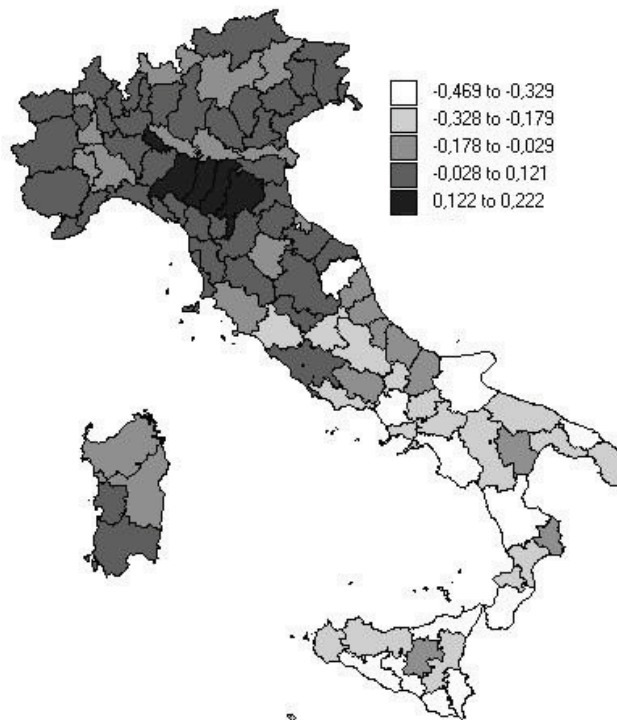


Figure 2: Purchased Service Intensity after removing industry fixed effects. The figure plots the provincial average of firm-level residuals of a regression of PSI on 4-digit industry dummies.

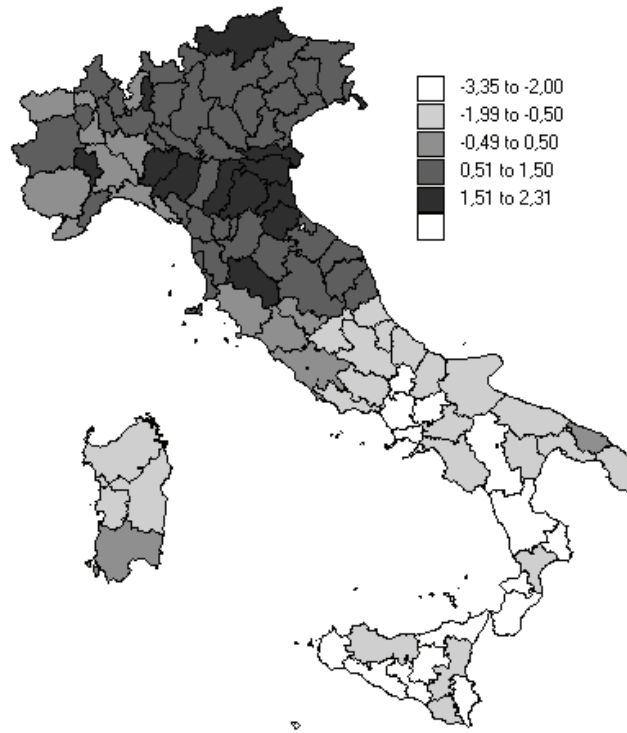


Figure 3: Map of civic capital measured by the first principal component of blood donations, volunteering, and electoral turnout.

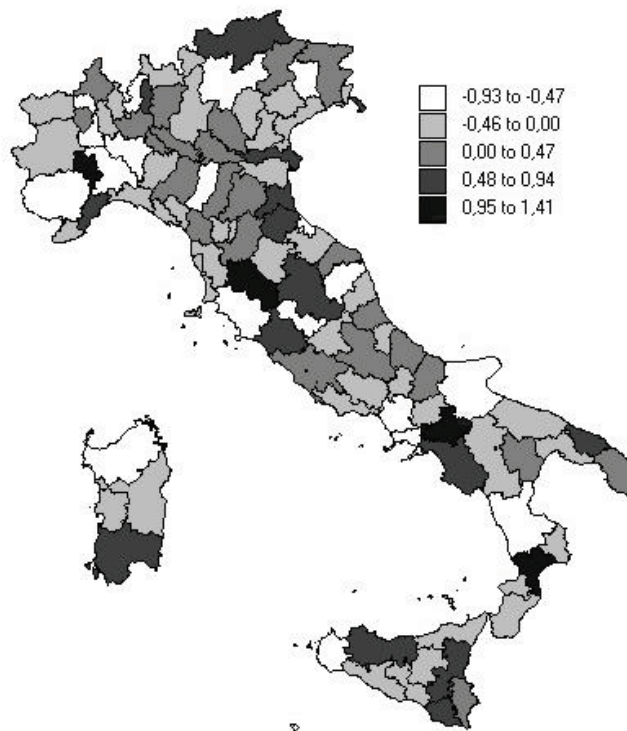


Figure 4: Map of civic capital measured by the variation of the first principal component within regions. The figure plots the residuals of a regression of the provincial principal component on regional dummies.

Table 1: Baseline analysis

	(1)	(2)	(3)	(4)	(5)
	Turnout	Blood	Volunteers	All proxies	Principal comp.
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
Turnout (log)	0.469** (0.22)			0.517** (0.21)	
Blood donations (log)		0.007 (0.02)		0.024 (0.02)	
Volunteers (log)			0.013 (0.02)	0.011 (0.02)	
Principal component					0.020* (0.01)
Size (log)	0.029** (0.01)	0.029** (0.01)	0.029** (0.01)	0.029** (0.01)	0.029** (0.01)
Capital stock (log)	0.021*** (0.00)	0.021*** (0.00)	0.021*** (0.00)	0.021*** (0.00)	0.021*** (0.00)
Value added (log)	-0.050*** (0.01)	-0.050*** (0.01)	-0.050*** (0.01)	-0.050*** (0.01)	-0.050*** (0.01)
Service (log)	0.057*** (0.01)	0.053*** (0.01)	0.052*** (0.01)	0.057*** (0.01)	0.053*** (0.01)
Final demand (log)	0.008** (0.00)	0.009** (0.00)	0.009** (0.00)	0.008** (0.00)	0.008** (0.00)
Length of trials (log)	-0.020 (0.03)	-0.009 (0.03)	-0.010 (0.03)	-0.023 (0.03)	-0.014 (0.03)
Bank branches (log)	0.008* (0.00)	0.008* (0.00)	0.007* (0.00)	0.006 (0.00)	0.005 (0.00)
University graduates (log)	-0.080* (0.04)	-0.048 (0.04)	-0.051 (0.04)	-0.088** (0.04)	-0.062 (0.04)
Regional dummies	Yes	Yes	Yes	Yes	Yes
F-test of joint sign. (p-value)				0.057	
$R^2$	0.033	0.032	0.032	0.033	0.032
Obs.	93,822	93,822	93,822	93,822	93,822

*Note:* The dependent variable is the log of PSI. The table provides the results of the fixed effect estimator where the panel variable are 4-digit industries. 20 regional dummies are also included. Standard errors are clustered at the province and industry level. We use the following variables to measure civic capital: *Turnout* is the log of the average electoral turnout in referenda between 1946 and 1987; *Blood donations* is the log of the number of blood donations per 1000 inhabitants in 2002; *Volunteers* is the log of the number of volunteers in non-profit institutions per 100,000 inhabitants in 2000; *Principal component* is the first principal component of the above mentioned three proxies of civic capital. We also include the following firm level controls: *Size* is the log of firm size, in terms of the number of workers; *Capital* is the log of capital stock, in terms of intangible assets; *Value added* is the log of value added. We also include the following provincial controls: *Final demand* is the log of population, with weights for each industry obtained from Input-Output Use tables; *Service* is the log of the number of workers in knowledge intensive business sectors; *University graduates* is the log of the share of university graduates over total population; *Bank branches* is the log of the number of bank branches per 1000 inhabitants; *Length of trials* is the log of the number of days it takes to complete a first-degree trial in labor-related affairs. Unless otherwise stated, the data refer to the year 2001. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively.

Table 2: Heterogeneous effect of civic capital according to firm size

	(1)	(2)	(3)	(4)	(5)
	Turnout	Blood	Volunteers	All proxies	Principal comp.
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
Turnout (log)	0.980*** (0.24)			0.726*** (0.27)	
Turnout (log) * Size (log)	-0.220*** (0.05)			-0.103 (0.07)	
Blood donations (log)		0.139*** (0.04)		0.084** (0.04)	
Blood donations (log) * Size (log)		-0.057*** (0.01)		-0.028** (0.01)	
Volunteers (log)			0.101*** (0.03)	0.056 (0.04)	
Volunteers * Size (log)			-0.037*** (0.01)	-0.019 (0.01)	
Principal component					0.065*** (0.01)
Principal Component * Size (log)					-0.020*** (0.00)
Size (log)	0.726*** (0.22)	0.060 (0.11)	0.116 (0.14)	0.571*** (0.21)	-0.143* (0.08)
Capital Stock (log)	0.022*** (0.00)	0.021*** (0.00)	0.021*** (0.00)	0.022*** (0.00)	0.022*** (0.00)
Value Added (log)	-0.051*** (0.01)	-0.051*** (0.01)	-0.051*** (0.01)	-0.051*** (0.01)	-0.052*** (0.01)
Service (log)	0.057*** (0.01)	0.055*** (0.01)	0.056*** (0.01)	0.059*** (0.01)	0.055*** (0.01)
Service(log) * Size (log)	-0.000 (0.00)	-0.001 (0.00)	-0.002 (0.00)	-0.001 (0.00)	-0.001 (0.00)
Final Demand (log)	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)
Final Demand (log) * Size (log)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Length of Trials (log)	-0.123*** (0.04)	-0.092** (0.04)	-0.109** (0.04)	-0.098** (0.04)	-0.088** (0.04)
Length of Trials (log) * Size (log)	0.042*** (0.01)	0.033** (0.01)	0.038*** (0.01)	0.029** (0.01)	0.029** (0.01)
Bank Branches (log)	-0.019 (0.02)	-0.014 (0.02)	-0.017 (0.02)	-0.031** (0.01)	-0.032** (0.02)
Bank Branches (log) * Size (log)	0.010* (0.01)	0.009 (0.01)	0.010 (0.01)	0.015** (0.01)	0.015** (0.01)
University Graduates (log)	-0.032 (0.08)	0.021 (0.08)	-0.004 (0.08)	-0.041 (0.08)	-0.015 (0.08)
University Graduates (log) * Size (log)	-0.018 (0.02)	-0.027 (0.02)	-0.018 (0.02)	-0.017 (0.02)	-0.017 (0.02)
Regional dummies	Yes	Yes	Yes	Yes	Yes
F-test of joint sign. (p-value)				0.000	
F-test of joint sign. (p-value) int.				0.000	
R <sup>2</sup>	0.034	0.034	0.034	0.034	0.034
Obs.	93,822	93,822	93,822	93,822	93,822

Note: See Table 1 for the description.

Table 3: Sensitivity analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	Manuf. Coef./se	Manuf. Coef./se	Services Coef./se	Services Coef./se	Good JQ Coef./se	Bad JQ Coef./se
Principal Component	-0.001 (0.01)	0.066*** (0.02)	0.033** (0.02)	0.085*** (0.02)	0.045 (0.03)	0.084*** (0.02)
Principal Component * Size (log)		-0.024*** (0.00)		-0.027*** (0.01)	-0.009 (0.01)	-0.033*** (0.01)
Size (log)	0.078*** (0.01)	-0.113 (0.13)	-0.025 (0.02)	-0.188** (0.08)	0.035 (0.17)	-0.457** (0.23)
Capital Stock (log)	0.016*** (0.00)	0.016*** (0.00)	0.023*** (0.00)	0.023*** (0.00)	0.021*** (0.00)	0.022*** (0.00)
Value Added (log)	-0.074*** (0.01)	-0.075*** (0.01)	-0.027* (0.02)	-0.030* (0.02)	-0.068*** (0.01)	-0.028 (0.02)
Service (log)	0.023** (0.01)	0.028 (0.03)	0.073*** (0.01)	0.058*** (0.02)	0.057*** (0.02)	0.077*** (0.02)
Service (log) * Size (log)		-0.002 (0.01)		0.006 (0.01)	-0.004 (0.00)	-0.005 (0.01)
Final Demand (log)	0.003 (0.00)	0.006 (0.01)	0.014** (0.01)	0.022** (0.01)	0.010 (0.01)	0.003 (0.01)
Final Demand (log) * Size (log)		-0.001 (0.00)		-0.003 (0.00)	0.001 (0.00)	0.002 (0.00)
Length of Trials (log)	0.001 (0.04)	-0.109 (0.08)	-0.046 (0.03)	-0.078** (0.03)	-0.035 (0.10)	-0.154 (0.10)
Length of Trials (log) * Size (log)		0.037* (0.02)		0.013 (0.01)	0.004 (0.02)	0.066* (0.04)
Bank Branches (log)	0.009 (0.01)	-0.025 (0.02)	-0.005 (.)	-0.042*** (0.02)	-0.020 (0.02)	-0.033 (0.08)
Bank Branches (log) * Size (log)		0.012** (0.01)		0.018** (0.01)	0.005 (0.00)	0.073** (0.03)
University Grad. (log)	-0.037 (0.06)	0.010 (0.18)	-0.093 (0.06)	-0.102 (0.08)	-0.090 (0.10)	0.025 (0.12)
University Grad. (log) * Size (log)		-0.015 (0.05)		0.010 (0.03)	0.006 (0.03)	-0.043 (0.04)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
$R^2$	0.035	0.038	0.038	0.041	0.012	0.040
Obs.	35,547	35,547	46,390	46,390	57,706	36,070

*Note:* Dependent variable is the log of PSI. The table provides the results of the fixed effect estimator where the panel variable are 4-digit industries. 20 regional dummies are also included. Standard errors are clustered at the province and industry level. In columns (1) and (2) we include only firms operating in manufacturing sectors. In columns (3) and (4) we include only firms operating in service sectors. In columns (5) we include only firms located in provinces whose quality of contract enforcement is below the median quality. In columns (6) we include only firms located in provinces whose quality of contract enforcement is equal or above the median quality. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively. For the description of the variables see Table 1.

Table 4: Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Add. Ctr.	Add. Ctr.	Serv	Serv	All Obs	All Obs	MI,RM,TO	MI,RM,TO
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
Principal Component	0.020* (0.01)	0.065*** (0.01)	0.020* (0.01)	0.065*** (0.01)	0.021* (0.01)	0.062*** (0.01)	0.025** (0.01)	0.073*** (0.01)
Principal Component * Size (log)		-0.020*** (0.00)		-0.020*** (0.00)		-0.018*** (0.00)		-0.021*** (0.00)
Firm Age (log)	0.019 (0.01)	0.013 (0.01)						
Firm Age squared (log)	-0.006** (0.00)	-0.005* (0.00)						
Diversif. Ownership - 3	0.202*** (0.08)	0.199*** (0.08)						
Diversif. Ownership - 5	1.636*** (0.05)	1.650*** (0.05)						
GDP (log)			0.058 (0.06)	-0.064 (0.07)				
GDP (log) * Size (log)				0.062*** (0.02)				
All Services (log) * Size (log)					0.056*** (0.01)			
All Services (log)						-0.001 (0.00)		
Firm Level Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions	No	Yes	No	Yes	No	Yes	No	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.033	0.035	0.032	0.034	0.033	0.035	0.036	0.038
N	93822	93822	93822	93822	97133	97133	72650	72650

Note: The dependent variable is the log of Purchased Service Intensity. The table provides the results of the fixed effect estimator where the panel variable are 4-digit industries. 20 regional dummies are also included. Standard errors are clustered at the province and industry level. In columns (1) and (2) we include additional firm level controls: firm age and an indicator of shareholder concentration. In columns (3) and (4) we include additional province level controls: *Share Industr. District* that is the log of the share of employees working in industrial districts and *GDP*, nominal gross domestic product. In columns (5) and (6) we proxy the size of the service market by *All Services*, measured as the log of the number of workers in service sectors. In columns (7) and (8) we include the previously excluded industries. In columns (9) and (10) we exclude observations located in the provinces of Rome, Milan and Turin. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively. For a description of the variables see Table 1.

Table 5: Instrumental variables analysis

Panel A: Second Stage (Dependent var. is ln PSI)					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	2SLS	2SLS
	Coef./se	Coef./se	Coef./se	Coef./se	Coef./se
Principal Component	0.045***	0.083***	0.092***	0.138***	0.043**
	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Principal Component * Size (log)		-0.019***		-0.022***	
		(0.00)		(0.01)	
Size (log)	0.028**	-0.821***	0.028**	-0.685***	0.028**
	(0.01)	(0.18)	(0.01)	(0.19)	(0.01)
Capital Stock (log)	0.021***	0.021***	0.021***	0.021***	0.021***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Value Added (log)	-0.050***	-0.051***	-0.050***	-0.052***	-0.057***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Macro Region Dummy	Yes	Yes	Yes	Yes	Yes
Province Covariates	Yes	Yes	Yes	Yes	Yes
Interactions	No	No	No	Yes	No
Hansen test of overidentif. (p-value)					0.108
r2	0.031	0.033	0.029	0.032	0.009
N	93822	93822	93822	93822	77892
Panel B1: First Stage (Dependent var. is Principal Component)					
			Coef./se	Coef./se	
Turnout 1920s (log)			4.752***	5.459***	
			(0.92)	(1.07)	
Turnout 1920s (log) × ln Size				-0.447**	
				(0.22)	
Aid Societies 1873 (log) × ln Size				0.059	
				(0.04)	
1 free-city state in 1300					0.404***
					(0.15)
2 free-city state in 1300					0.728***
					(0.16)
3 free-city state in 1300					-0.178
					(0.23)
Macro Region Dummy	Yes	Yes	Yes	Yes	Yes
F-test of joint sign. (p-value)			0.000	0.000	0.000
r2			0.84	0.84	0.66
Panel B2: First Stage (Dependent var. is Prin.Comp × ln Size )					
Turnout 1920s (log)				-2.958	
				(2.75)	
Turnout 1920s (log) * Size (log)				4.414***	
				(1.25)	
Aid Societies 1873 (log) * Size (log)				0.635***	
				(0.19)	
F-test of joint sign. (p-value)				0.000	
r2				0.80	

*Note:* The table provides the results of the fixed effect two-stages least squares estimator where the panel variable are 4-digit industries. 5 macro-regional dummies are also included. Standard errors are clustered at the province and industry level. Panel A shows the second stage, while Panel B1 and B2 shows the first stage. All variables included in the second stage are also included in the first stage. *Province Covariates* include the log of all provincial controls shown in Table 1. *Interactions* include all provincial controls interacted with the log of firm size. In all specifications, the log of provincial GDP is also included. See text for description of the remaining variables. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level, respectively.