Trust, Firm Organization, and the Pattern of Comparative Advantage*

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Abstract

Interpersonal trust favors the delegation of decisions and tasks within firms, allowing the expansion of more productive units. We show that this interaction between trust and firm organization contributes to shaping the pattern of comparative advantage: high-trust regions and countries exhibit larger value-added and export shares in delegation-intensive industries relative to other industries. Consistent with the idea that trust allows firms to expand beyond a narrow circle of family members and friends, such effects are driven by an increase in average firm size, reflecting in turn a shift of the size distribution away from the smallest firms and toward the small-to-medium ones. According to our estimates, trust is no less relevant than human or physical capital, or institutions in shaping the pattern of comparative advantage.

Keywords: Trust, delegation, comparative advantage, firm size
JEL Codes: Z01, E23, L23

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1. Introduction

According to the neo-classical Heckscher-Ohlin model, the pattern of comparative advantage is determined by relative factor abundance across countries. While earlier empirical work focused primarily on physical and human capital endowments (see e.g. Leamer, 1984, Staiger, 1988, and Romalis, 2004), interest has shifted more recently towards the role of institutions. In particular, Nunn (2007) and Levchenko (2007) first showed that better contract enforcement drives comparative advantage in sectors characterized by contract incompleteness in market transactions between input providers and downstream producers. Indeed, both papers conclude that institutional quality is more important than physical and human capital abundance for comparative advantage in such sectors.

While sound legal systems and efficient contract enforcement may limit the scope for principal-agent problems in market transactions between different firms and companies, delegation of decisions and tasks between members of the same organization – owners and managers, or employers and employees – falls largely outside the shadow of law. The complexity of modern production processes (e.g. in terms of unforeseen contingencies) may in fact raise the transaction costs of contracting inside the firm to prohibitive levels (e.g. in terms of monitoring by third parties), which in turn prevents the efficient division of labor in the economy.

Interpersonal trust may attenuate such inefficiencies by sustaining cooperation among anonymous others and people outside the narrow circle of family members and close friends (Putnam, 1993). For this reason, trust has long been recognized as a fundamental factor behind the rise of large organizations, including firms and companies (Fukuyama, 1995, La Porta et al., 1997). One reason is that trust favors the delegation of decisions down the managerial hierarchy, which allows more efficient firms to leverage their productivity advantage over a larger amount of inputs (Bloom et al, 2012). According to this view, higher

levels of trust should lead to more efficient, higher levels, of production (a comparative advantage) in all contexts in which delegation is especially relevant for the internal organization and management of firms (Rajan and Zingales, 2001, and Thesmar and Thoenig, 2000).

In this paper, we investigate the effect of trust on the organization of production and the pattern of comparative advantage across Italian regions and European countries. In particular, we exploit variation in the intensity of delegation between industries to test whether high-trust regions and countries exhibit higher value-added and exports in delegation-intensive industries. Our empirical specification builds on previous work focused on the role of factor endowments (Romalis, 2004), finance (Rajan and Zingales, 1998) and institutions (Nunn, 2007; Levchenko, 2007; Ferguson and Formai, 2013) in shaping industry specialization.

In order to measure differences in the intensity of delegation across industries, we collected firm-level data on the degree of internal delegation of responsibilities and decisions for a representative sample of Italian firms. We then decomposed differences in delegation into regional and industry components, and interpreted the latter as a measure of the average delegation-intensity of each industry (net of the role of any region-specific factor and controlling for firm size). Consistent with previous theoretical work (Rajan and Zingales, 2001, Acemoglu et al., 2007), human capital and intangible assets' intensities are positively related to delegation-intensity across industries. The same methodology is applied to survey information about experiences at work for a sample of European individuals, which allowed us to recover an alternative measure - suitable for cross-country analysis. Despite different sources and samples, the firm - and individual - based industry rankings line up nicely, which adds to the credibility of both variables as measures of industry delegation-intensity.

We find that trust is associated on average with greater delegation and larger firm size. Exploiting industry variation in delegation-intensity (and controlling for region- and

industry-specific factors) we show that high-trust countries and regions exhibit a larger share of value-added and exports in industries characterized by a greater need for delegation. The effect is driven by a shift of the firm-size distribution away from the smallest units toward firms in higher size classes. These latter findings vindicate the argument of Fukuyama (1995) about the "strong relationship between high-trust societies with plentiful social capital (…) and the ability to create large, private business organizations" (see also La Porta et al., 1997, and Bertrand and Schoar, 2006).

All our results are robust to controlling for other determinants of comparative advantage that vary across geographic areas and industries (in addition to the full sets of fixed effects along each dimension), paying particular attention to judicial quality as an alternative enforcement device, and to human capital intensity as an important factor inducing a higher need for delegation.

The role of trust proves significant when compared to other drivers of comparative advantage. For example, we find that increasing trust by an amount corresponding to the inter-quartile range of its distribution across Italian regions, would raise value-added in a delegation-intensive industry (such as "Manufacture of machinery and equipment") relative to a less intensive industry (such as "Leather, leather products and footwear") by 24% (the effect is remarkably similar when using cross-country data: 19%). This amounts to around two-thirds of the implied effect of an inter-quartile increase in human capital, and is larger than the effect of increased physical capital or better contract enforcement.

Overall, our evidence highlights trust as an important determinant of comparative advantage across countries and industries. While previous work has emphasized its effect *via* institutional arrangements that are conducive to economic growth, like greater financial development (Guiso at al., 2004a, 2008, Karlan, 2005, and Carlin et al., 2009) or lighter regulatory burden (Aghion et al., 2010, 2011, and Pinotti, 2012), we focus on the direct impact on the organization of production and comparative advantage across countries. In this last

respect our work is closely related to Bloom et al. (2012), who show that trust increases delegation and average firm size for a sample of large national and multinational companies across 12 countries.

The first contribution of the present paper is to document that the same relationship holds widely across the firm size distribution. Indeed, we find that the largest shifts occur along the lower tail of the distribution, consistent with the idea that trust allows for an expansion of smaller firms beyond the narrow circle of family members and close friends. Our second contribution is to show that such a relationship has immediate implications for the pattern of specialization across Italian regions and European countries. In particular, interpersonal trust turns out to be an important source of comparative advantage, alongside physical and human capital endowments or the quality of formal institutions.

Finally, we also complement recent work by Kastl et al. (2013), who study the effect of delegation on R&D spending. After showing significant differences between firms in Northern and Southern Italy, they conjecture that such differences "could be due to the well-documented differences among those regions in various values that are crucial for delegation, such as trust": the present paper tests exactly this mechanism.

The rest of the paper is organized as follows: Section 2 justifies our empirical framework in light of previous literature on delegation and production activity; Section 3 describes our measure of delegation and provides some preliminary evidence on its relationship with average trust and firm size across Italian regions, while Section 4 presents the results of the econometric analysis across regions, countries and industries; finally, Section 5 concludes.

2. Background and empirical approach

2.1 Agency problems and firm organization

Production activity in market economies is based on the efficient division of labor within large organizations such as firms and companies (see Penrose, 1959 and Chandler, 1962). In

such a context, a limited span of control over the different stages of complex production processes induces "principals" (e.g. owners and entrepreneurs) to delegate decisions and tasks to a variety of "agents" (e.g. managers and employees) in order to maximize productivity.

According to the economic theory of organization (see Bloom et al, 2010, for a survey), the reallocation of decision-making power down the managerial hierarchy is associated with several advantages. First, delegation allows the exploitation of scarce factors such as the informational advantage of managers and the specific skills of some categories of technicians and workers. This is essential whenever production requires the combination of different talents and abilities, for instance in human capital- and technology-intensive industries (Rajan and Zingales, 2001). Second, it reduces the costs of information transfer, allowing information to be processed at the level where it is most likely to be used, thus saving on the cost of codification, transmission and analysis at subsequent upstream levels (Bolton and Dewatripont, 1994). Finally, it increases firms' ability to promptly respond to changes in profit and growth opportunities. Adjustment to market conditions involves the coordination of many activities, which may be easier when responsibility is transferred to downstream teams of workers (Thesmar and Thoenig, 2000).

Yet, in a context of contract incompleteness delegation exposes the principal to the risk of expropriation by agents. One leading example is shirking by employees, the extent of which has been shown to vary greatly with the system of societal values and beliefs (Ichino and Maggi, 2000). Another example is managers running away from the company with intangible assets such as ideas and client relationships (Rajan and Zingales, 2001); the greater the extent of delegation, the higher the vulnerability of company owners to managers' actions. Further, in general, agency problems are a recurrent theme in the literature on firm organization and corporate governance - at least since the works of Alchian and Demsetz (1972), Holmstrom (1982) and Fama and Jensen (1983).

To some extent, effective contract enforcement may mitigate the risks associated with principal-agent conflicts when relationship-specific investments along the production chain are a relevant source of comparative advantage (Levchenko, 2007 and Nunn, 2007). Yet, legal enforcement is likely to be less relevant for the internal working of an economic organization, as contracting inside the firm usually involves high transaction costs due to the difficulty for the principals to fully predict and specify all possible state-contingencies - as well as to monitor the agents' effort and performance.[1] While incentive schemes have been devised to align the objectives of different members of the organization, they always involve some trade-off. For instance, efficiency wages raise the expected costs of shirking for the employees, but they are also expensive for the firm that has to pay above-market wages; stock options align the objectives of managers with those of the owners but may cause myopic managerial strategies, and so on.

As an alternative solution, close personal relationships such as family ties, friendship and other types of connections may go a long way toward reducing agency problems, especially in countries with weak legal institutions (Bertrand and Schoar, 2006). However, they necessarily limit firm size to the span-of-control of family members or close friends, implying a misallocation of talents and preventing the expansion of firms that would have the potential to do so (Caselli and Gennaioli, 2013, and Perez-Gonzales, 2006).

By contrast, trust allows for cooperation inside the organization without limiting its size. Higher interpersonal trust means that the principal attaches a lower probability to the event of expropriation by agents other than family members and friends, and is therefore more prone to delegate decisions and tasks whenever this yields to cost advantages or to firm growth opportunities. Other things being equal, then, firms in high-trust countries and regions should exhibit on average greater internal delegation and larger size.

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[1] An earlier analysis of these issues may be found in Knight (1921), while Lafontaine and Slade (2007) provide a recent overview.

In the next section, we show that the latter prediction is consistent with preliminary evidence across Italian regions. However, such correlations may reflect omitted variation in several economic and institutional characteristics. To address this issue, Bloom et al. (2012) focus on the sub-sample of multinational subsidiaries included in their survey of firms and exploit trust differences for the country in which the headquarters are located (controlling for the subsidiary's location), as well as variation in countries' bilateral trust (between the headquarters' and subsidiaries' locations). The present paper exploits an alternative source of variation, namely differences in the level of delegation required for production in different industries within the same region or country.

2.2 Trust, delegation, and comparative advantage

Several recent papers (e.g. Acemoglu et al., 2007, and Bloom et al., 2010) show that intensity in delegation varies with the characteristics of the production process (e.g. the technology used). Following the cross-country, cross-industry approach popularized by Rajan and Zingales (1998), we investigate whether trust influences firm organization and the production structure by looking at its effect on industries characterized by different intensity in delegation. In particular, controlling for other area- and industry-specific factors, trust-abundant regions and countries should exhibit disproportionately larger firm size, value-added and export shares in delegation-intensive industries.

Our baseline estimating equation is therefore

$$Y_{jr} = \alpha + \beta(Trust_r \times Delegation_j) + \delta' X_{jr} + \mu_r + \mu_j + \varepsilon_{jr} \tag{1}$$

where $Y_{j,r}$ is industry specialization, as measured by the log of value-added and exports, of the r-th region (or country) in industry j; $Trust_r$ is average trust in each region (or country) and $Delegation_j$ is an industry-specific measure of the need for delegation; $X_{j,r}$ is a vector of other determinants of specialization, while μ_r and μ_j are local and industry-specific fixed

effects, respectively; finally, $\varepsilon_{j,r}$ is an error term summarizing the effect of other omitted factors.

The inclusion of region fixed effects, combined with the log-linear specification, allows for the interpretation of the coefficient β as the comparative advantage of trust-abundant regions in industries with greater delegation-intensity. Also, the full set of fixed effects along both dimensions (regions and industries) addresses obvious endogeneity issues: across regions, aggregate economic outcomes and beliefs could be jointly determined in equilibrium, as shown for instance by Giuliano and Spilimbergo (2009) and Aghion et al. (2010, 2011); across lines-of-work, global growth opportunities in industries that are more (less) dependent on delegation would bias the interaction coefficient upward (downward). The cross-area, cross-industry specification in (1), pioneered by Rajan and Zingales (1998) to study the effect of finance on growth, has been extensively used to study several sources of comparative advantage, namely physical and human capital (Romalis, 2004; Ciccone and Papaioannou, 2009), contract enforcement (Nunn 2007) and institutional quality (Levchenko 2007).

Empirically estimating equation (1) raises some methodological issues, the most important of which concern the measurement of delegation-intensity in each j-th industry.

3. Data and preliminary evidence

We conduct the empirical analysis across Italian regions and European countries. The analysis using Italian data allows us to exploit considerable variation in trust between the northern and southern part of the country, while keeping constant other institutional factors (Putnam, 1993). Moreover, comparing regions within the same country avoids translating the concept of "trust" (and, more generally, survey questions) into different languages. On the other hand, the multi-country analysis is informative about the applicability of our results to countries other than Italy. The analysis will largely focus on a group of advanced European economies that are relatively homogenous in terms of economic development and institutional arrangements. This section illustrates how we measured industry delegation-

intensity and trust across countries and regions. The Appendix Data description provides more details on the other variables and sources used in the analysis.

3.1 The Bank of Italy survey

Since the early 1970s, the Bank of Italy has been conducting a yearly survey on the investments of Italian firms (INVIND). The sample has progressively expanded to about 6,500 units, which is representative of all private, non-agricultural firms with more than 20 employees. In addition to measuring production inputs and outputs (e.g. investment, sales, exports, etc.) on a regular basis, the survey provides "soft" information on issues such as organization, governance and expectations. Most of these questions are included only in some years and/or for a subsample of firms.[2]

In particular, one such question concerns the number of responsibility centers, defined in the management literature as the units of the organization whose managers are accountable for a set of activities or a specific project (Atkinson and Kaplan, 1998, Horngren et al., 2009). Other things being equal, the number of responsibility centers increases with the extent of delegation inside the organization.[3] The question was addressed to a random sub-sample of 1,853 manufacturing firms included in the 2009 round of the survey. The response rate was above 80%, which is relatively high for this type of non-routine question.

About one third of the respondents turned out to be extremely centralized, exhibiting just one responsibility center. As would be expected, these are on average smaller firms, with a median and mean number of employees equal to 88 and 127, respectively (the corresponding figures for the whole group of respondents are 96 and 200, respectively). On average, firms

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[2] Such questions have been extensively used in previous work, see e.g. Guiso and Parigi (1999)

[3] Responsibility centres include cost, revenues, profit and investment centres, depending on the variable under the actual control of the manager. This further classification does also provide important insights into the actual extent of delegation inside the firm (see, e.g., Acemoglu et al., 2007). We chose not to operate this distinction in the INVIND survey in order to limit non-response issues.

are organized into 5 responsibility centers (median equal to 3), or 3.6 every 100 employees (median 2.4).

3.2 Delegation across manufacturing industries

The estimating equation (1) exploits variation in trust across regions (or countries) and differences in delegation-intensity of production activities across industries (*Delegation$_j$*). To measure the latter variable, we regress the number of responsibility centers in each *i*-th firm on a full set of region and industry fixed effects, keeping constant the (log) number of workers *L* employed in firm *i*:

$$Centers_{jr} = \eta + \theta \ln L_{ijr} + f_j + f_r + v_{ijr}, \tag{2}$$

where the sub-indexes *j* and *r* denote industries and regions, respectively, f_j and f_r are the corresponding fixed effects, and v_{ijr} is an idiosyncratic error term. Each estimated fixed effect $\hat{f}_j$ equals the average residual level of delegation for firms operating in the *j*-th industry, keeping constant firm size as well as time-invariant, region-specific factors (including trust). In this sense, it can be interpreted as an industry-specific component that depends only on the characteristics of the industry (for instance, the complexity of the production process).[4]

How reliable are such indicators? We provide three complementary pieces of evidence to validate their use as indexes of industry-specific delegation-intensity. First, we re-estimated equation (2) on the data about management and organizational practices by Bloom et al. (2012). In this case, the measure of delegation on the left-hand side of (2) is a synthetic index of plant managers' autonomy along four dimensions (hiring, capital expenditure, marketing, and product innovations decisions).[5] Figure 1 shows that the industry-specific dummies

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[4] In Section 4.3 we present an alternative measure computed from European individual-level data using a similar approach.

[5] Bloom et al. (2012) collected such information for 4,000 firms in the US, Europe and Asia (see http://www.stanford.edu/~nbloom/ORG_Replication.zip). Due to the small size of the Italian sub-sample (less

recovered in this way are positively correlated to our delegation measure. Considering each of Bloom et al. (2012) four sub-indexes separately, we find that the correlation is strongest when looking at autonomy in investment and product innovation decisions. Second, we use information on firms' ownership, governance and management structure contained on the "Survey on European Firms in a Global Economy" (EFIGE).[6] These data allowed us to compare our indicator to industry-level indexes of the degree of centralization in firms ownership and governance. More specifically, they allowed us to compute: (i) the share of family firms, (ii) the probability that the CEO is the founder or a member of the owning family, (iii) the percentage of firms fully managed by members or acquaintances of the owning family, and (iv) the share of "external" managers (i.e. those recruited from outside the firm). Figure 2 shows that our industry measure of delegation correlates negatively and significantly with the first three indexes, and positively with the share of "external" managers. Finally, and in line with the conjecture of Rajan and Zingales (2001), we show that intensity in delegation increases with the intensity of production in human capital and intangible assets; see Figure 3. For this reason, in the empirical analysis, it will be important to account for the potentially confounding role of these other industry characteristics.

This evidence justifies using the set of (estimated) industry fixed effects in equation (2) as a measure of industry-specific delegation-intensity in equation (1). To account for the presence of a generated regressor, we will bootstrap standard errors by drawing 200 random samples with replacement from the firm-level dataset (to compute alternative estimates of industry-specific delegation-intensity $\hat{f}_j$ from equation 2) and the region-industry (or country-industry) dataset, to collect a sample of replicated estimates of the parameters of interest in

(1). For each parameter, the sample standard deviation is then used as an estimate of the standard error (see Chiang and Knight, 2011, for a similar approach).[7]

3.3 Trust

Equation (1) interacts industry intensity in delegation with interpersonal trust. To measure the latter we refer to the trust question in the World Values Survey (WVS): "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". The finest geographical detail of aggregation reported in the WVS is the region in which the interview was conducted.[8] We thus measure trust by the average fraction of respondents that answers "Most people can be trusted" in each region over the three waves of the WVS conducted in Italy (1990, 1995 and 2005).

Table 1 reports the average level of interpersonal trust across Italian regions.[9] The table also reports the region fixed effects estimated in (2), which measure average delegation across regions holding constant the industry composition and controlling for firm size (in equation 2). Figure 4 shows that trust is positively correlated with delegation and average firm size across regions. In particular, a standard deviation increase in trust is associated with 1/2 and 2/3 standard deviation increases in delegation and firm size (statistically significant at the 5% and 1% confidence level), respectively.

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[7] Notice that the different level of (dis-)aggregation of the data underlying equation (1) and (2) does not allow bypassing the generated regressor issue by simply substituting (2) into (1) and running one-step estimates. To identify the role of trust on specialization using cross-region(-country) cross-industry data one is eventually forced to estimate a proxy for delegation as a (conditional or unconditional) average of individual data. We experimented with different approaches that allow for error correlation within geographical areas and industries. Standard errors are generally lower when allowing for one-way or two-way clustering (following Cameron et al. 2011, and Thompson, 2011). This is likely due to the fact that clustering across a small number of units (in our case, a few areas and/or industries) may lead to downward-biased standard errors. For this reason, we also implemented the wild-cluster bootstrap procedure suggested by Cameron et al. (2008), obtaining almost identical significance levels (see Table A8)

[8] Italy comprises 20 regions, corresponding to level 2 of the Eurostat Nomenclature of Territorial Units for Statistics (NUTS). In 2010, the average population per region was about 3 million, the median was 1.85 million. The small autonomous region of Valle d'Aosta, at the border with France, is aggregated to Piedmont. The complete list of regions, along with some basic information, is reported in Table 1.

[9] See also Figure A6 in the Online Appendix

Of course, such huge effects may reflect, at least in part, the significant gap between northern and southern regions along many economic and social dimensions other than trust endowments. The cross-region, cross-industry specification in (1) allows estimating the effect of trust accounting for such differences, as well as for industry-specific characteristics. Moreover, it allows identifying the channel through which trust impacts on the structure of production, namely differences in delegation-intensity across different economic activities.

4. Results

In this section, we empirically estimate equation (1) across Italian regions and industries. The main variable of interest is the interaction between regional trust and the industry-specific component of firm delegation, described in the previous section.

4.1 Italian regions: trust and comparative advantage

Table 2 shows the estimated effect of differences in regional trust and industry intensity in delegation on the pattern of comparative advantage across regions, measured both in terms of industry log value-added (Panel A) and exports (Panel B).[10] The results in Panel A suggest that higher trust yields an increase in the relative share of production in delegation-intensive industries. The estimate is strongly statistically significant and high in terms of magnitude. One way to get a sense for the size of the effect is to consider the share of value-added in an industry close to the 75th percentile of delegation intensity ("Manufacture of machinery and equipment") relative to an industry at the 25th percentile ("Leather, leather products and footwear"). The estimated coefficient in column (1) implies that the difference in value-added

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[10] Absent regional accounts with a detailed industry breakdown, the levels of value added and exports are obtained aggregating firm-level (INVIND) survey data. The survey is representative of the universe of firms with more than 20 employees. While accounting for the bulk of production in non-construction sectors (more than 70% of total employment and around 80% in terms of revenues) INVIND does not allow full coverage of all 285 region-industry cells (16 observations are missing). Missing cells consist mainly of highly concentrated industries in smaller regions. For example, the "Coke, Refined Petroleum Products and Nuclear Fuel" industry (isic code 23), characterized by the presence of few large firms over the Italian territory, is missing in 8 regions. Data on average firm size used in Section 4.2, by contrast, are sourced from the 2005 Italian industry census and therefore offer full coverage of region-industry cells.

between "Manufacture of machinery and equipment" and "Leather, leather products and footwear" would rise by approximately 24%, if trust increased by the amount corresponding to the difference between a region close to the 25th percentile of average regional trust (such as Abruzzo) and one close to the 75th percentile (such as Tuscany).

The implied differential effect is slightly higher according to the estimates in column (2), where we account for factor endowments as additional determinants of comparative advantage (see Romalis, 2004, and Ciccone and Papaioannou, 2009). *College X HC int.* is the interaction between human capital endowments and skill-intensity in region *r* and industry *j*, respectively, while *Capital X Cap. Int.* is the interaction between private physical capital endowments and industry capital intensity. Our findings tend to confirm existing evidence (e.g. Romalis, 2004) that human capital is the most prominent determinant of the pattern of specialization.[11] Reassuringly, and despite the strong correlation between delegation and human capital intensities across industries (see Figure 3), the interaction coefficient of trust is unaffected.

In column (3) we include two additional determinants of comparative advantage that, if omitted, may bias the estimated importance of trust: financial development and judicial quality. As to the former, Guiso et al. (2004a) show that trust fosters financial development across Italian regions, while Rajan and Zingales (1998) document its effect on the firm-size distribution. Since industry intensity in delegation is also positively correlated with dependence on external finance (the correlation coefficient is equal to 0.57 and statistically significant at the 5% level), the observed pattern of comparative advantage may be picking up the role of finance. However, the direct effect of trust remains significant even after controlling for its indirect effects through financial development, i.e. including the interaction

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[11] According to our estimates, increasing human capital from the low levels of Basilicata to the high levels of Lombardy would increase the value added share of a skill-intensive industry (like Transportation equipment) relative to a less intensive industry (like Textiles) by nearly 27%.

between regional financial development and industry dependence on external finance (*FD X ED*).

In the same column, we also show that our coefficient is not capturing differences in the quality of the judicial system, which in principle could represent an alternative enforcement device. While the quality of formal institutions (including the judicial system) remains constant within the same country, differences in informal values and beliefs could impact on their effectiveness across different areas. In particular, the average length of civil trials, which is one of the most commonly used indicators of judicial quality (see, e.g., the World Bank Doing Business project), exhibits considerable variation across Italian regions.[12] Since the effectiveness of contract enforcement is also an important determinant of organizational choices, we interact the negative logarithm of such a variable with a measure of industry intensity in institutional quality. One such measure is the fraction of intermediate inputs used by each industry (according to the input-output tables) that is *not* traded in an organized exchange market, thus requiring relationship-specific investment. In a context of contract incompleteness, input-providers for such industries would be more vulnerable to weak contract enforcement (Nunn, 2007). According to the results in column (3), trust and human capital are the main sources of comparative advantage across Italian regions.

We next experiment with alternative estimation methods meant to account for the possibility of error in the measurement of aggregate outcome variables using the INVIND data. While representative of the Italian economy at the regional level, INVIND data are not meant to be representative of the region-industry cells we are focusing on. In column (4) we thus weight observations by employment in each region-industry cell, while in column (5) we down-weight influential observations following the iterative procedure devised by Li (1985). In both cases, the estimated coefficients are still positive and slightly higher in magnitude compared to the OLS estimates (see Tables A9 and A10 in the Online Appendix for the detailed results).

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[12] The average length of civil trials across Italian regions is reported by the Italian Statistical Institute (ISTAT).

Panel B of Table 2 reports the results for exports. While the coefficients are somewhat less precisely estimated, they are qualitatively very similar to previous estimations and indicate that high-trust regions export relatively more in delegation-intensive industries. As to the implied magnitude, the most conservative estimate in column (4) suggests that the export share of a high-delegation industry ("Manufacture of machinery and equipment") relative to a low-delegation industry ("Leather, leather products and footwear") would increase by around 40% if the average level of trust increased from the low level of Abruzzo to the high level of Tuscany.

4.2 Italian regions: Trust and firm size

Overall, the results in Table 2 suggest that higher trust is associated with a relative increase in the production and exports of delegation-intensive industries. According to the discussion in Section 2, such an effect should be associated with an expansion of firm size beyond the level achievable in a low-trust environment. To isolate this channel more precisely, we replace value-added and exports with average firm size on the left hand side of equation (1). The results are reported in Panel A of Table 3.

The first three columns adopt the same specification as in Table 2. According to our estimates, high-trust areas are populated by larger firms in high-delegation industries. As to the implied effects, the estimated coefficient in column (1) means that the differential in average firm size between a more decentralized industry ("Manufacture of machinery and equipment") and a less decentralized one ("Leather, leather products and footwear") would increase by 14% when moving from a trust-scarce region (Abruzzo) to a trust-abundant one (Tuscany).

The subsequent columns examine the robustness of these findings to two alternative mechanisms that have been previously investigated in the literature. First, Rajan and Zingales (2001) argue that "a more sophisticated legal system is needed to enforce property rights to intangible assets such as ideas or client relationships […] the relative size of firms in

industries with intangible assets should increase when the efficiency of the judicial system improves". However, accounting for the interaction between legal efficiency and a measure of industry intensity in intangible assets (as measured by Claessens and Laeven, 2003) does not reduce the role of trust (column 4).

The second possibility is that trust affects firm size through the decision of whether to integrate or not along the production chain, as lower trust toward input providers could yield greater vertical integration and larger firm size. Notice that, if this were true, the empirical relationship between trust and firm size (Figure 4) would provide a lower bound to the (positive) effect of trust through delegation. However, the interaction between trust and an industry measure of propensity to vertical integration (as calculated by Acemoglu et al., 2010) does not seem to be significantly related to firm size (column 5). Most importantly, the effect of trust (through delegation) remains unaffected, even when including all other factors at the same time (column 6).

The exercise reported in Panel B looks more closely at the relationship between trust and the overall distribution of firm size (not just its average value). The first two columns confirm that trust favors the expansion of industries' through the increase in the average size of firms as opposed to their number, as the latter is not significantly affected. Exploiting the breakdown by firm size provided by the Italian industry census (1-19, 20-49 and 50+ employees), the last three columns of Panel B show that the increase in firm size is driven by a rightward shift of the distribution away from the smallest firms (1-19 employees) toward the small to medium firms (20-49 employees). This is consistent with the idea that trust allows for an expansion of smaller firms beyond the narrow circle of family members and close friends.

While interaction models as (1) are mainly used to assess the differential impact of a region- (or country-) level variable across different industries, Guiso et al. (2004b) discuss a

methodology to infer its aggregate (e.g. region-level) impact on the outcome of interest.[13] We applied this procedure to recover the economic impact of a hypothetical increase in trust across Italian regions from its actual to the highest observed level (that of Trentino/Südtirol, based on WVS data). The results are sizable in particular in the case of Southern Italian regions (the eight regions from Abruzzo to Sardinia in Table 1, whose population accounts for around 40 percent of the total and whose levels of trust and economic development are significantly lower than in the rest of the country).

We started considering the case of firm size. Using the coefficient reported in col. 3 of Table 3, Panel A, we estimate that higher trust would raise the average size of manufacturing firms in all Southern regions by 20-30%. For reference, in these areas average firm size was less than half as large as in the leading region in 2005 (see the last column of Table 1). Similarly, our estimates in Table 2 (col. 3) imply that Southern regions would see value-added and exports in manufacturing (which account for just 13% and 11% of the total, respectively) increase in excess of 50%, if levels of trust were to reach those observed in the most trusting region in Italy.

4.3 Cross-country evidence

The evidence presented so far confirms that trust fosters delegation inside firm organizations, which in turn shifts comparative advantage toward industries in which the production process relies heavily on the delegation of decisions and tasks. In this section, we examine the robustness of these findings across countries.

Data. Cross-country data allow for better measurement of industry aggregates, as value-added and exports are based on national industry censuses that cover the universe of firms (as opposed to regional aggregates of survey data). Such information, together with the

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[13] The procedure hinges on a number of stringent hypotheses, so these calculations should be taken with caution. In particular, one must assume that there exists one "control" industry in which the effect of trust on firm size is negligible (see also Bassanini et al., 2009). Conditional on this assumption, the methodology essentially aggregates across industries within each region the changes in Y_{jr} predicted by the estimated β.

number of people engaged in each industry, is available from the OECD Structural Analysis Database (STAN), while the number of firms and the fraction of self-employed are available from the Business Demography Statistics (also from the OECD).

As to measures of trust and delegation, we exploit information from the European Social Survey (ESS). The ESS is a cross-sectional survey administered every two years since 2002 in a large sample of European nations. During each round, the ESS interviews a representative sample of around 2,000 individuals in each country about a wide range of topics in the economic, social and cultural sphere. Merging this information with the OECD industry data, our final sample includes 15 countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Netherland, Poland, Portugal, Spain, Sweden, and United Kingdom.[14] This sample is characterized by rich variation in cultural traits, with Scandinavian and Mediterranean countries lying respectively at the top and bottom of the ranking in terms of trust (see also Figure A7 in the Online Appendix).

The ESS asks, among other things, "how much the management at your work allows/allowed you to influence policy decisions about the activities of the organization", with 0 indicating "I have no influence" and 10 "I have complete control". Differently from the INVIND variable, the ESS indicator captures mostly perceptions on the actual degree of delegation from the point of view of employees (as opposed to formal organigrams). As in the previous case, we projected the variable (over 8000 individual-level observations referring to workers employed in manufacturing) on a full set of country and industry fixed effects, and take the latter as a measure of industry intensity in delegation (see Section 2).[15]

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[14] No information is available on "Coke, Refined Petroleum Products and Nuclear Fuel" in three small countries (Austria, Denmark and Portugal). Moreover, industry value added data are unavailable in the case of Poland, and in two Portuguese industries. This implies that the firm size and export regressions are estimated on 222 (not 225) observations and the value added regressions are estimated on 205 observations.

[15] The specification is the same as in equation (2) except for the fact that the ESS does not provide the actual size of the firm the individual works in but only a categorical variable indicating 5 size classes.

Figure 5 shows that there is a strong correlation between the two measures of industry intensity in delegation, the one based on the INVIND survey of the Bank of Italy and the other one based on the ESS; the only outlier is the residual category "manufacturing not elsewhere classified". The relationship is indeed remarkable as the two variables are based on independent surveys that cover different types of agents (firms and individuals, respectively), were conducted in different countries and are aggregated at a different geographical level (regions and countries, respectively). The fact that they are nevertheless significantly correlated adds to their credibility as measures of the same industry-specific characteristic - namely intensity in delegation.[16] Importantly, as we show at the end of this section all our core results would be confirmed if country trust was interacted with the INVIND- (as opposed to the ESS-) based measure of delegation intensity.

Results. The results of the cross-country, cross-industry analysis are summarized in Tables 4 and 5. Unlike the approach adopted across Italian regions, the multi-country exercise requires controlling for variation along a greater number of institutional dimensions. For brevity, we report and discuss only the coefficients of interest, the complete results are presented in the Online Appendix.

In Table 4 we report the estimates obtained for several specifications of log value-added and exports (complete results in Tables A11 and A12 of the Online Appendix). In particular, columns (1) to (3) and (5) to (7) show that trust-abundant countries specialize in delegation-intensive industries and that the effect is robust to controlling for human and physical capital endowments, as well as for the other sources of comparative advantage considered before, namely judicial quality and financial development. In columns (4) and (8) we augment the specification with other potential determinants of comparative advantage that vary with country-level institutional settings. We include entry regulations interacted with industry

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[16] As in the case of Italian regions, the measure of industry-delegation is positively correlated to an analogous measure computed on Bloom et al. (2010) data on managers' autonomy on hiring, capital expenditure, marketing, and product innovations decisions.

turnover of producers (Fisman and Sarria-Allende, 2010); labor market regulations interacted with industry labor intensity (Cingano et al., 2010); and property rights protection interacted with the degree of contract incompleteness (Levchenko, 2007, and Nunn, 2007).

The main coefficient of interest remains positive and statistically significant at conventional confidence levels - only slightly decreasing in magnitude when the additional interaction terms are included on the right-hand side. As to the implied effects, they are lower than in the regional analysis, in particular for the case of exports. The most conservative estimate of column (8) implies that exports in a high-delegation industry ("Manufacture of machinery and equipment") would increase by about 15% relative to a low-delegation industry ("Leather, leather products and footwear") if average trust increased from the level of countries close to the 25th percentile of the trust distribution (such as Spain or Greece) to that of countries around the 75th percentile of the distribution (such as Germany, or the Netherlands). A very similar result holds in the case of value-added (the increase would amount to around 19%). [17]

Table 5 replicates the analysis in Table 3 on the relationship between trust and the size distribution of firms (see also Tables A13 and A14 in the Online Appendix). In Panel A we report the estimated effects on average firm size, which are positive and highly statistically significant in all specifications. The estimated coefficients imply that the size differential between a high-delegation and a low-delegation industry would increase by between 10% (column 5) and 15% (column 1) if average trust in the country increased from the 25th to the 75th percentile. The breakdown by size class in Panel B confirms that (i) there is no significant relationship between trust and the number of firms, so that all the effect on industry value-added is felt via an increase in average firm size, and (ii) such an increase is due to a shift of

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[17] As in the case of Italian regions, the implied effect of trust compares fairly well with that of human capital. According to our estimates, increasing the average skills of the population from the low levels of Poland to those of the UK would increase the value added share of a skill-intensive industry (like Transportation equipment) relative to a less intensive industry (like Manufacture of non-metallic mineral product) by nearly 38%.

the firm size distribution away from the smallest firms (1-19 employees). Both findings are remarkably similar to those estimated in the case of Italian regions. Finally, and consistently with the above findings, the coefficient in column (6) of Panel B indicates that the share of self-employed individuals in delegation-intensive industries tends to be disproportionately lower in high-trust countries.[18]

All results across countries are confirmed when we interact average country trust with the measure of industry intensity in delegation based on the INVIND Survey of Italian firms – as opposed to the European Social Survey – see Tables A15 and A16 in the Online Appendix. This is consistent with the fact that the two measures of delegation are strongly correlated with each other (see Figure 5), as they both measure the delegation-intensity implied by the production technology in each industry.

We also checked the robustness of the main results across a larger sample of countries. Measuring value-added and firm size from UNIDO Indstat, exports from COMTRADE, and interpersonal trust from the World Values Survey, we expanded the sample to 66 countries. The UNIDO data aggregate information from country industry census and surveys, which introduces significant measurement error and comparability issues. For this reason, the OLS estimates of the effect on value-added and average firm size are less precise than the baseline estimates based on the OECD STAN industry dataset that guarantees a greater degree of comparability across countries. However, all our main results are confirmed on the larger sample once we account for the presence of outliers. Indeed, employing three alternative "robust regression" approaches – the M-estimator of Huber (1964), Least Absolute Value regression, and the MM estimator of Yohai (1987) – the coefficient of interest is statistically significant and nearly twice as large as the OLS. Also, the effect on exports is always large

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[18] Applying the same methodology discussed at the end of section 4.2 confirms that higher trust might have non-negligible aggregate consequences for the size of firms. Firm size would increase in excess of 25% in countries such as Greece, Spain and Portugal (as well as in Eastern countries as Poland and the Czech Republic), should their average level of trust reach that of Sweden (the highest in the sample). For reference, firms in these countries are on average 50 to 80% smaller than in Germany, the country with largest firms.

and strongly statistically significant. The interested reader can refer to Table A17 in the Online Appendix for the results on the larger sample.

4.4 Further sensitivity analysis

The results in Table 2 to Table 5 show that high-trust regions and countries exhibit comparative advantage and larger firm size in industries with greater delegation-intensity. These relationships are robust to controlling for additional determinants of comparative advantage and firm organization, including the interaction between human capital endowments and human capital intensity, and the interaction between judicial quality and the share of inputs not traded in an organized market. These results allow us to disentangle trust-induced comparative advantage from the patterns of comparative advantage uncovered by Ciccone and Papaioannou (2009) and Nunn (2007).

However, in light of the strong correlation between trust, human capital endowments and judicial quality our coefficient of interest could reflect the comparative advantage of human capital abundant countries in delegation intensive industries.[19] For this reason, in columns (2) and (3) of Tables 6 and 7 we include on the right-hand side of the regression the interaction between human capital endowments and intensity in delegation. Although this variable is somewhat correlated with our outcomes of interest, when we include it in the same regression with the interaction between trust and intensity in delegation, only the latter coefficient is generally statistically significant (column 3). The same is true when we interact intensity in delegation with judicial quality (columns 4 and 5).

Similarly, given that intensity in delegation is strongly correlated with intensity in skilled labor and the share of inputs that is not traded in organized markets, our coefficient of interest could reflect the comparative advantage of trust abundant countries in sectors that use skills and non-traded inputs more intensively. Therefore, in columns (6)-(9) of Tables 6

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[19] The correlation between trust and human capital across countries is 0.69, the correlation between trust and judicial quality is 0.59. The same correlation coefficients across Italian regions are 0.13 and 0.86.

and 7 we interact country trust also with industry intensity in human capital and non-traded inputs. Even in this case, the estimated effect of trust through industry intensity in delegation is not significantly affected.[20]

5. Conclusions

We investigate one specific channel through which interpersonal trust matters for the organization of production and the level of economic activity. As trust facilitates the delegation of decision making within firms, high-trust areas exhibit a higher amount of resources allocated to delegation-intensive activities; by the same argument, the same industries are characterized by larger average firm size. We document these facts combining micro and macro data on the organization and structure of production in Italian regions and European countries. Our estimates suggest that, after controlling for other determinants of comparative advantage and specialization, trust endowments shape the structure of production in the same way as (and to an extent that is comparable with that of) other factors that are commonly examined in the literature, such as human and physical capital or the quality of formal institutions.

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[20] In a few specifications in Tables 6 and 7, the coefficient of interest is less precisely estimated. This loss in precision reflects the high degree of correlation between the two interaction variables included in the regression (the two regressors always have one interacted variable in common). In any event, the coefficient of interest is not statistically significant at conventional confidence level only in 3 out of 24 robustness specifications in Tables 6 and 7 (columns 3, 5, 7, 9). By contrast, the coefficient of the other interaction variable is non-significant in 22 out of 24 cases.

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Figures

Figure 1: Industry intensity in delegation: a comparison with Bloom et al (2010)
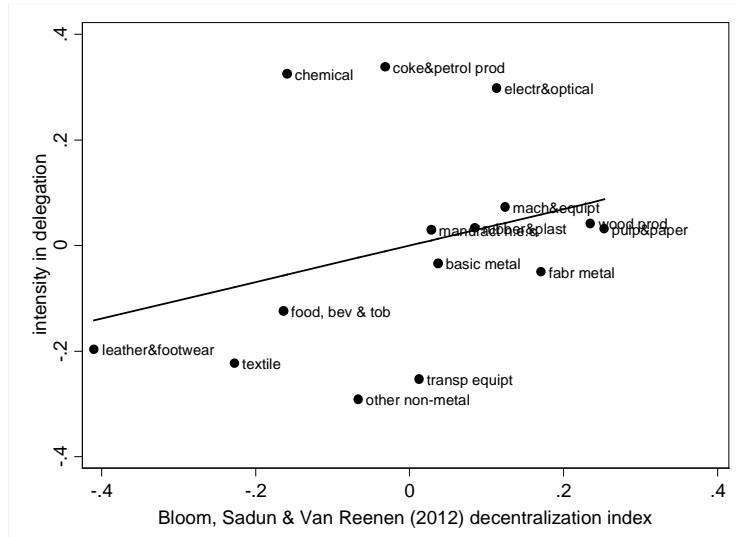
Notes: The y-axis is industry-level delegation as defined in section 3.2; The x-axis denotes industry delegation as obtained applying the same procedure to the organizational survey used by Bloom et al. (2010)

Figure 2: Industry intensity in delegation: a comparison with EFIGE data
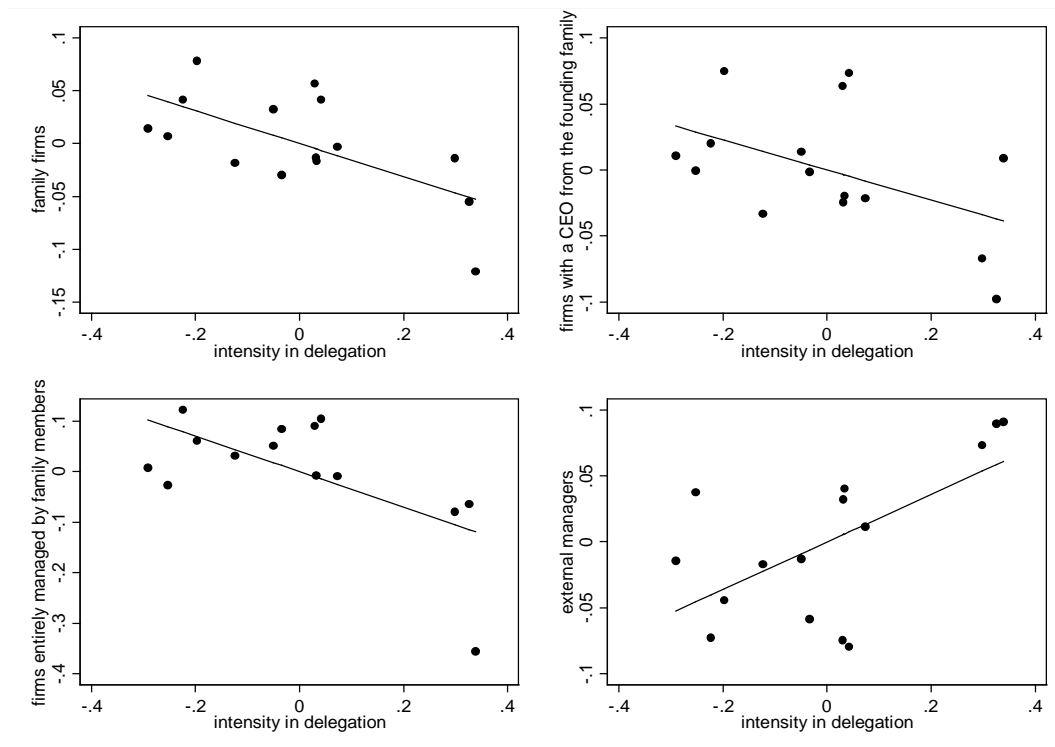
Notes: The four figures show correlation of industry-level delegation as defined in section 3.2 with industry-level indexes of (i) the share of family firms, (ii) the probability that the CEO is the founder or a member of the owning family, (iii) the percentage of firms fully managed by members or acquaintances of the owning family, and (iv) the share of "external" managers (i.e. those recruited from outside the firm). These are obtained from the sub-sample of Italian firms in the Efige dataset.

Figure 3: industry intensity in delegation and dependence on human capital and intangible assets
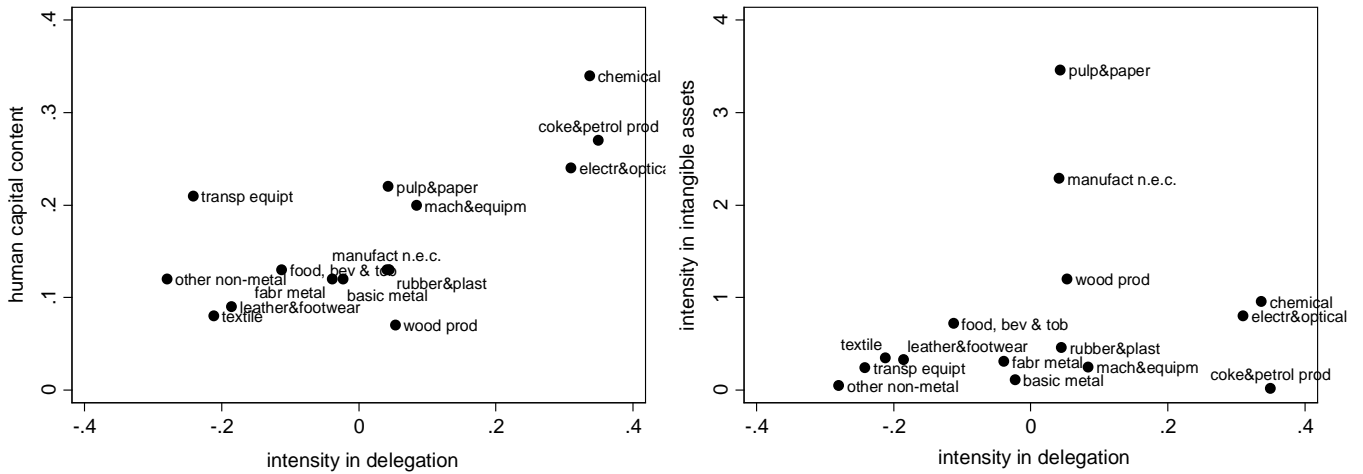
*Notes***:** This figure plots industry intensity in delegation against human capital intensity (left graph) and intensity in intangible assets (right graph) across 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC).

Figure 4: trust, delegation and firm size across Italian regions
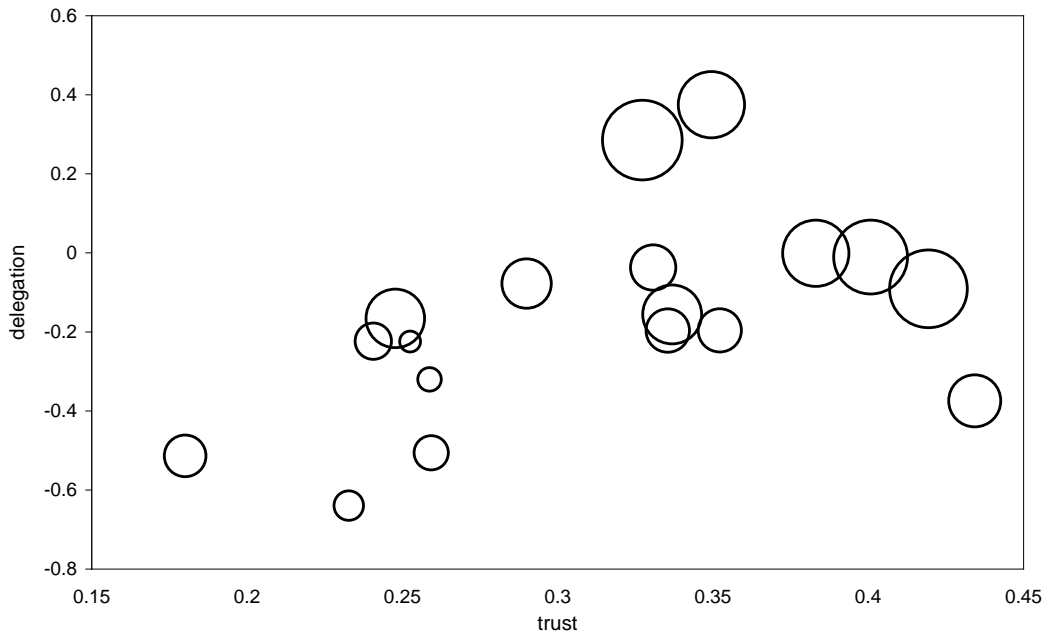
*Notes***:** This figure plots average interpersonal trust (horizontal axis) against the average level of delegation in productive activities (vertical axis) and the average size of firms (the size of the ball) across Italian regions.

Figure 5: correlation between different measures of industry intensity in delegation
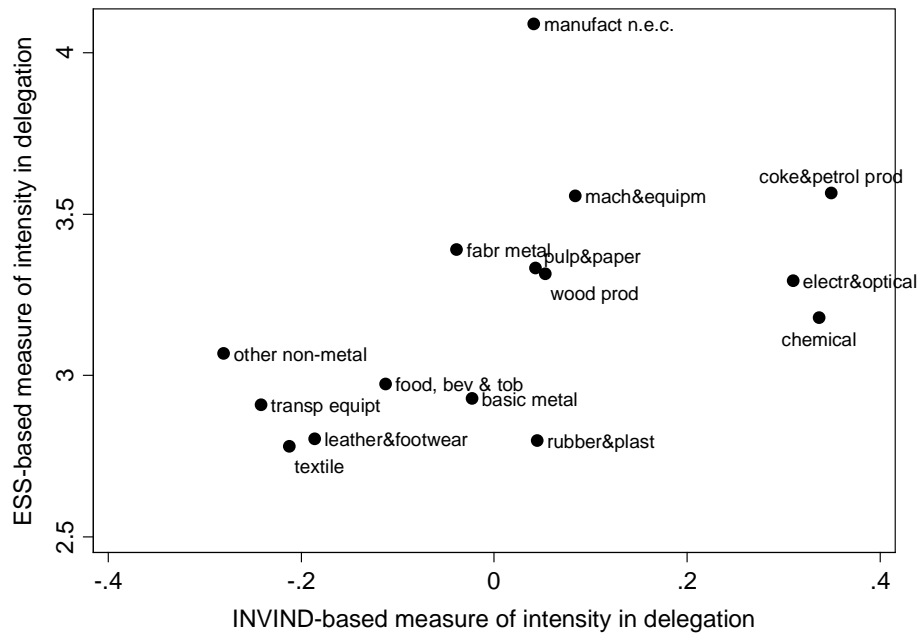
Notes: This figure plots two different measures of industry intensity in delegation, based respectively on the INVIND survey of Italian firms (horizontal axis) and on the European Social Survey (vertical axis) across 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC).

Tables

Table 1: main characteristics of Italian regions

Region	Label	Area	GDP, % Italy	GDP p.c.	pop. (1000s)	Trust	Delegation (FE)	Firm size
Piedmont & Valle d'Aosta	Pie & Vda	28,664	8.4%	28,714	4,502	0.33	0.29	12.6
Lombardy	Lom	23,861	20.8%	33,442	9,594	0.40	-0.01	11.7
Liguria	Lig	5,421	2.8%	26,813	1,609	0.34	-0.20	6.9
Trentino Alto Adige	Taa	13,599	2.1%	32,403	1,001	0.43	-0.37	8.3
Veneto	Ven	18,390	9.4%	30,244	4,803	0.38	0.00	10.5
Friuli Venezia Giulia	Fvg	7,712	2.3%	29,238	1,217	0.42	-0.09	12.3
Emilia Romagna	Emr	22,122	8.8%	32,113	4,250	0.35	0.37	10.5
Tuscany	Tus	22,990	6.7%	28,431	3,658	0.35	-0.20	6.9
Umbria	Umb	8,454	1.4%	24,493	879	0.29	-0.08	7.8
Marche	Mar	9,695	2.6%	26,502	1,545	0.34	-0.16	9.4
Lazio	Laz	17,210	10.8%	30,306	5,527	0.33	-0.04	7.2
Abruzzo	Abr	10,793	1.8%	21,602	1,317	0.25	-0.17	9.3
Molise	Mol	4,438	0.4%	19,951	321	0.18	-0.51	6.6
Campania	Cam	13,592	6.3%	16,909	5,801	0.26	-0.51	5.4
Apulia	Apu	19,364	4.5%	17,111	4,073	0.24	-0.22	5.8
Basilicata	Bas	9,992	0.7%	18,699	591	0.21		7.4
Calabria	Cal	15,083	2.2%	16,938	2,003	0.25	-0.22	3.3
Sicily	Sic	25,701	5.6%	17,179	5,023	0.26	-0.32	3.8
Sardinia	Sar	24,090	2.2%	20,405	1,663	0.23	-0.64	4.7

Notes: This table reports the main characteristics of Italian regions. See the Appendix Data description for more details

Table 2: trust and industry comparative advantage across Italian regions

	(1)	(2)	(3)	(4)	(5)
	Baseline	Factors	Institut.	WLS	Li-estimator
PANEL A: log of VALUE ADDED					
Trust X Delegation	9.958**	8.310**	9.098**	12.466**	12.791***
	(4.731)	(4.199)	(4.181)	(5.751)	(4.891)
College X HC int.		2.285***	2.321***	1.192	2.432***
		(0.749)	(0.859)	(0.752)	(0.864)
Capital X Cap. Int.		0.817	0.509	0.302	-1.848
		(2.210)	(2.194)	(2.046)	(2.276)
JQ X differentiated			2.353	6.700**	1.824
			(1.713)	(3.258)	(1.860)
FD X ED			-0.005	-0.623	0.345
			(0.518)	(1.133)	(0.559)
Observations	269	269	269	269	269
Adjusted R²	0.559	0.578	0.579	0.749	0.624
F	17.789	17.714	16.511	23.250	13.044
PANEL B: log of EXPORTS					
Trust X Delegation	22.670*	20.236*	22.521*	15.230*	19.165***
	(12.049)	(11.624)	(12.645)	(8.921)	(7.358)
College X HC int.		2.843*	2.808*	1.657	3.302***
		(1.577)	(1.569)	(1.286)	(1.181)
Capital X Cap. Int.		0.059	-0.115	2.119	-7.038
		(4.842)	(4.471)	(4.751)	(4.422)
JQ X differentiated			1.633	5.550	4.436*
			(3.053)	(3.560)	(2.299)
FD X ED			0.969	-0.231	1.221
			(1.325)	(1.205)	(0.948)
Observations	269	269	269	269	269
Adjusted R²	0.499	0.504	0.501	0.635	0.691
F	12.412	12.739	12.466	15.508	17.184

*Notes***:** This table presents the results of OLS estimates of the differential effect of trust on log value added (Panel A) and exports (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The other explanatory variables are described in the Appendix. Region and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 3: trust and firm size across Italian regions and industries

	(1)	(2)	(3)	(4)	(5)	(6)
	Base	Factors	Instit.	RZ	Vert Integ	All

PANEL A: log of average FIRM SIZE

	Base	Factors	Instit.	RZ	Vert Integ	All
Trust X Delegation	6.138**	5.116**	5.451**	5.551**	5.393**	5.491**
	(2.488)	(2.192)	(2.124)	(2.238)	(2.181)	(2.301)
College X HC int.		1.129**	1.125**	1.123**	1.126**	1.123**
		(0.506)	(0.444)	(0.440)	(0.462)	(0.494)
Capital X Cap. Int.		-0.782	-0.818	-0.811	-0.819	-0.808
		(0.669)	(0.661)	(0.634)	(0.734)	(0.678)
JQ X differentiated			0.477	0.493	0.423	0.384
			(1.036)	(1.073)	(1.059)	(1.192)
FD X ED			0.014	0.017	0.008	0.005
			(0.336)	(0.357)	(0.347)	(0.352)
JQ X Intangible Assets				-0.035		-0.058
				(0.133)		(0.129)
JQ X Vert. Integration					-0.010	-0.021
					(0.056)	(0.061)
Observations	285	285	285	285	285	285
Adjusted R^2	0.711	0.727	0.726	0.725	0.725	0.724
F	31.504	35.486	33.706	32.675	32.700	31.654

PANEL B: Size Distribution of firms

	log-number of firms		*log-number by size class*		
	Base	Factors	1-19	20-49	50+
Trust X Delegation	0.143	1.671	-2.045***	5.849***	3.730
	(3.675)	(3.085)	(0.762)	(2.209)	(2.323)
College X HC int.		0.591**	-0.032	0.148	1.038***
		(0.259)	(0.067)	(0.265)	(0.349)
Capital X Cap. Int.		1.104**	-0.163	1.462***	0.439
		(0.500)	(0.181)	(0.423)	(0.493)
JQ X differentiated		1.576**	0.406	0.681	0.365
		(0.680)	(0.257)	(0.633)	(0.692)
FD X ED		0.184	-0.047	0.279	-0.148
		(0.275)	(0.051)	(0.232)	(0.394)
Log total number of firms			1.009***	1.012***	0.797***
			(0.013)	(0.055)	(0.067)
Observations	285	285	285	285	285
Adjusted R^2	0.927	0.930	0.998	0.940	0.896
F	184.249	179.096	6268.621	186.199	90.028

*Notes***:** This table presents the results of OLS estimates of the differential effect of trust on average firm size (Panel A) and the firm size distribution (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The other explanatory variables are described in the Appendix. Region and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 4: trust and industry comparative advantage across European countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	log of VALUE ADDED				log of EXPORTS			
	Baseline	Factors	Instit.	Controls	Baseline	Factors	Instit.	Controls
Trust X Delegation	2.682***	2.403**	2.410***	2.132**	2.015***	1.672**	1.744**	1.834**
	(0.887)	(0.966)	(0.892)	(0.981)	(0.771)	(0.776)	(0.839)	(0.867)
Observations	205	205	205	205	222	222	222	207
Prod. Factors	NO	YES	YES	YES	NO	YES	YES	YES
Institutions	NO	NO	YES	YES	NO	NO	YES	YES
Add. Controls	NO	NO	NO	YES	NO	NO	NO	YES
Adjusted R^2	0.881	0.886	0.885	0.885	0.863	0.870	0.871	0.872
F	65.643	62.643	58.740	59.903	54.600	56.262	55.343	52.161

Notes: This table presents the results of OLS estimates of the differential effect of trust on log value added (Panel A) and exports (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The bottom part of the table indicates which additional controls are included, the detailed results are reported in Table A11 and Table A12, all the variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 5: trust and firm size across European countries and industries

	(1)	(2)	(3)	(4)	(5)	(6)
	Base	Factors	Institutions	Controls	RZ	Vert. Int.
PANEL A: log of average FIRM SIZE						
Trust X Delegation	1.687**	1.703***	1.704**	1.668**	1.642**	1.056*
	(0.663)	(0.610)	(0.661)	(0.752)	(0.758)	(0.614)
Observations	222	222	222	207	207	207
Factors	NO	YES	YES	YES	YES	YES
Institutions	NO	NO	YES	YES	YES	YES
Add. Controls	NO	NO	NO	YES	YES	YES
Adjusted R2	0.832	0.831	0.829	0.827	0.826	0.835
F	48.852	45.851	42.457	38.078	37.648	38.336
PANEL B: size distribution of firms						
	log Number of firms			by size class		Share of
	Base	Factors	Institut	1-19	20-49	self empl.
Trust X Delegation	0.907	0.710	0.078	-0.205***	1.857***	-0.136***
	(0.672)	(0.677)	(0.762)	(0.077)	(0.590)	(0.052)
Control for log-number of firms in country-industry				YES	YES	YES
Observations	222	222	207	220	220	218
Factors	NO	YES	YES	YES	YES	YES
Institutions	NO	NO	YES	YES	YES	YES
Adjusted R2	0.919	0.922	0.922	0.723	0.828	0.675
F	143.863	128.827	116.559	18.823	38.263	15.421

Notes: This table presents the results of OLS estimates of the differential effect of trust on average firm size (Panel A) and the firm size distribution (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The bottom part of the table indicates which additional controls are included, the detailed results are reported in Table A13 and Table A14, all the variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 6: trust, comparative advantage and firm size in European countries, robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	baseline	HC X Delegation		JQ X Delegation		Trust X HC Intensity		Trust X differentiated	
Panel A: log of VALUE ADDED									
Trust X Delegation	2.682***		2.423***		2.028**		2.200**		2.665***
	(0.887)		(0.890)		(0.935)		(1.061)		(0.963)
Interaction variable		0.049**	0.012	0.877***	0.361	7.948	5.362**	0.832	0.413
		(0.021)	(0.017)	(0.324)	(0.310)	(2.148)	(2.538)	(1.512)	(1.558)
Observations	269	269	269	269	269	269	269	269	269
Adjusted R²	0.559	0.564	0.567	0.552	0.561	0.556	0.557	0.551	0.559
F	17.789	16.264	17.217	16.531	17.653	16.84	17.276	15.99	17.635
Panel B: log of EXPORTS									
Trust X Delegation	2.015***		2.115**		2.175**		1.756**		2.060***
	(0.771)		(0.839)		(0.906)		(0.884)		(0.716)
Interaction variable		0.029	-0.005	0.433*	-0.078	4.941	2.904	-0.642	-0.985
		(0.021)	(0.022)	(0.260)	(0.327)	(2.256)	(2.733)	(1.288)	(1.227)
Observations	269	269	269	269	269	269	269	269	269
Adjusted R²	0.559	0.564	0.567	0.552	0.561	0.556	0.557	0.551	0.559
F	17.789	16.264	17.217	16.531	17.653	16.84	17.276	15.99	17.635
Panel C: log of average FIRM SIZE									
Trust X Delegation	1.687**		1.379*		1.524		1.747**		1.736**
	(0.663)		(0.744)		(0.983)		(0.874)		(0.779)
Interaction variable		0.036**	0.014	0.438**	0.080	1.348	-0.679	-0.795	-1.084
		(0.014)	(0.016)	(0.189)	(0.215)	(1.777)	(2.720)	(1.193)	(1.393)
Observations	269	269	269	269	269	269	269	269	269
Adjusted R²	0.559	0.564	0.567	0.552	0.561	0.556	0.557	0.551	0.559
F	17.789	16.264	17.217	16.531	17.653	16.84	17.276	15.99	17.635

Notes: This table presents the results of OLS estimates of the differential effect of trust on log value added (Panel A), exports (Panel B) and log average firm size (Panel C) across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. Columns (2) to (9) include on the right-hand side another interaction variable indicated on top of each column. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table 7: trust, comparative advantage and firm size in Italian regions, robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	baseline	HC X Delegation		JQ X Delegation		Trust X HC Intensity		Tr. X Contr. Intensity	
		Panel A: log of VALUE ADDED							
Trust X Delegation	9.958**		7.951*		21.766**		7.756		10.744**
	(4.349)		(4.114)		(10.329)		(5.096)		(5.050)
Interaction variable		0.954**	0.841	1.587	-4.434	0.162**	0.061	3.195	4.950
		(0.440)	(0.532)	(1.599)	(3.480)	(0.080)	(0.113)	(4.474)	(4.725)
Observations	269	269	269	269	269	269	269	269	269
Adjusted R²	0.559	0.564	0.567	0.552	0.561	0.556	0.557	0.551	0.559
F	17.789	16.264	17.217	16.531	17.653	16.84	17.276	15.99	17.635
		Panel B: log of EXPORTS							
Trust X Delegation	22.670*		19.373*		28.833		29.655*		22.536*
	(12.618)		(11.780)		(24.235)		(17.082)		(12.314)
Interaction variable		1.658	1.382	5.662*	-2.314	0.193	-0.194	-4.520	-0.839
		(1.100)	(1.008)	(3.234)	(7.134)	(0.209)	(0.329)	(10.617)	(11.044)
Observations	269	269	269	269	269	269	269	269	269
Adjusted R²	0.499	0.497	0.505	0.493	0.497	0.488	0.498	0.486	0.497
F	12.412	11.540	12.266	12.155	12.473	11.49	12.351	11.44	12.478
		Panel C: log of average FIRM SIZE							
Trust X Delegation	6.138***		5.069**		14.891***		6.935**		5.908***
	(2.236)		(2.029)		(5.534)		(3.404)		(2.049)
Interaction variable		0.702**	0.649**	0.817	-3.244**	0.076**	-0.023	-2.559	-0.899
		(0.354)	(0.318)	(0.647)	(1.641)	(0.035)	(0.063)	(2.952)	(3.196)
Observations	285	285	285	285	285	285	285	285	285
Adjusted R²	0.711	0.723	0.729	0.702	0.718	0.704	0.710	0.702	0.710
F	31.504	31.253	31.325	31.710	30.660	32.72	30.379	30.93	30.333

*Notes***:** This table presents the results of OLS estimates of the differential effect of trust on log value added (Panel A), exports (Panel B) and log average firm size (Panel C) across industries characterized by a different intensity in delegation. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. Columns (2) to (9) include on the right-hand side another interaction variable indicated on top of each column. Region and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.
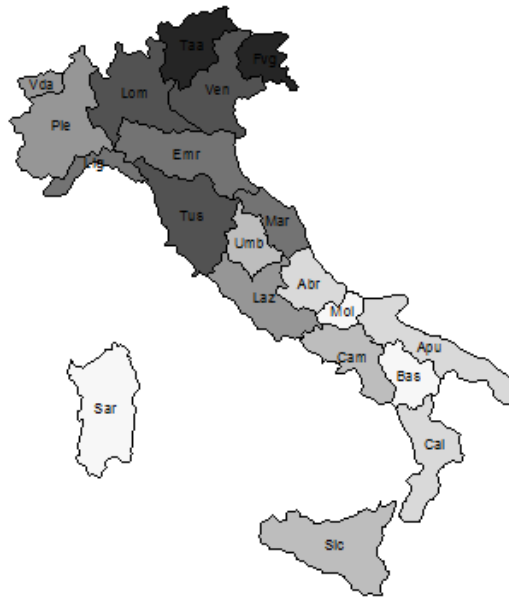
Online Appendix – not for publication

Figure A6: average interpersonal trust across Italian regions

Notes: This figure shows the distribution of average interpersonal trust across Italian regions, as measured by the World Values Survey. Darker colors correspond to higher interpersonal trust.

Figure A7: average interpersonal trust across European countries

Notes: This figure shows the distribution of average interpersonal trust across the 15 European countries included in our sample, as measured by the European Social Survey. Darker colors correspond to higher interpersonal trust.

ADDITIONAL RESULTS

Table A8: Accounting for one- and two-way clustering

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline specification (col. 1)				Specification with controls (col.3)			
	Heterosced	Clustered			Heterosced	Clustered		
	Robust	Two-way	Industry	Region	Robust	Two-way	Industry	Region
log of VALUE ADDED								
Trust X Delegation	9.958**	9.958***	9.958***	9.958**	9.098**	9.098***	9.098**	9.098***
	(4.643)	(3.143)	(2.415)	(4.783)	(4.191)	(3.204)	(4.034)	(3.014)
p-value	0.033	0.003	0.000	0.045	0.031	0.007	0.030	0.005
Wild Bootstrap-t (p-value)			0.039	0.000			0.023	0.002
Observations	269	269	269	269	269	269	269	269
Adjusted R2	0.559	0.559	0.559	0.559	0.579	0.580	0.581	0.582
log of EXPORTS								
Trust X Delegation	22.670*	22.670***	22.670**	22.670**	22.521*	22.521***	22.521**	22.521**
	(12.338)	(7.624)	(9.330)	(10.201)	(11.938)	(8.275)	(9.025)	(10.460)
p-value	0.067	0.006	0.021	0.033	0.061	0.010	0.017	0.038
Wild Bootstrap-t (p-value)			0.027	0.016			0.015	0.037
Observations	269	269	269	269	269	269	269	269
AdjR2	0.561	0.561	0.561	0.561	0.570	0.570	0.570	0.570
log of average FIRM SIZE								
Trust X Delegation	6.138***	6.138***	6.138***	6.138**	5.451***	5.451***	5.451***	5.451***
	(2.266)	(2.323)	(1.455)	(2.793)	(2.030)	(1.710)	(2.038)	(1.530)
p-value	0.007	0.012	0.000	0.035	0.008	0.003	0.011	0.001
Wild Bootstrap-t (p-value)			0.035	0.000			0.012	0.000
Observations	285	285	285	285	285	285	285	285
AdjR2	0.711	0.711	0.711	0.711	0.726	0.726	0.726	0.726

Notes: This table presents the results of OLS estimates of the differential effect of trust on log value added, exports and average firm size across industries characterized by a different intensity in delegation; cols. 1-4 use to the baseline specification (see e.g. Tab. 2, col.1); cols. 5-8 use to the augmented specification (see e.g. Tab. 2, col.3). Each column corresponds to a different approach to accounting for error correlation within industries and/or geographical areas in estimating standard errors (except cols. 1 and 5, where heteroskedasticity-robust standard errors are reported). In cols. 2 and 5 standard errors are estimated accounting for clustering at both the industry and region level, as proposed by Cameron et al. 2011, and Tomphson 2009). Cols 3-7 and 4-8 account for one way clustering at the industry and region level, respectively, using the standard CRSE estimator. These columns also report p-values from a test of the coefficient being equal to zero obtained using the Wild bootstrap-t technique proposed by Cameron et al. (2011, see appendix B, procedure 2a) to deal with cases when the number of cluster is small. For comparison, we also report the p-values associated to the original t-statistics. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The other explanatory variables are described in the Appendix. Region and industry fixed effects are included in all specifications; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A9: trust, value added and exports in Italian regions, employment weighted and iterative regression down-weighting outliers

	(1)	(2)	(3)	(4)	(5)	(6)
	Base	Factors	Institutions	Base	Factors	Institutions
	log of VALUE ADDED			**log of EXPORTS**		
EMPLOYMENT WEIGHTED						
Trust X Delegation	14.844***	14.021***	12.466**	14.044***	11.860***	12.791**
	(5.212)	(4.989)	(5.537)	(5.121)	(4.314)	(5.419)
College X HC int.		1.030	1.192		2.400***	2.432***
		(0.804)	(0.750)		(0.771)	(0.844)
Capital X Cap. Int.		1.349	0.302		-1.609	-1.848
		(1.833)	(2.127)		(1.768)	(2.321)
JQ X differentiated			6.700**			1.824
			(3.240)			(1.880)
FD X ED			-0.623			0.345
			(1.007)			(0.618)
Observations	269	269	269	269	269	269
Adjusted R²	0.717	0.721	0.749	0.602	0.626	0.624
F	20.985	19.985	23.250	13.281	13.839	13.044
ITERATIVE REGRESSION						
Trust X Delegation	17.147**	15.849*	15.230*	12.693*	15.633**	19.165**
	(8.531)	(8.480)	(8.946)	(7.116)	(7.241)	(7.729)
College X HC int.		1.586	1.657		3.349***	3.302***
		(1.110)	(1.385)		(1.251)	(1.042)
Capital X Cap. Int.		2.994	2.119		-6.505	-7.038*
		(4.776)	(4.906)		(4.339)	(4.118)
JQ X differentiated			5.550			4.436*
			(3.807)			(2.568)
FD X ED			-0.231			1.221
			(1.381)			(1.038)
Observations	269	269	269	269	269	269
Adjusted R²	0.619	0.627	0.635	0.778	0.683	0.691
F	17.854	17.466	15.508	29.409	17.506	17.184

*Notes***:** This table presents the results of employment-weighted-least-squares (top panel) and iterative regression estimates down-weighting outliers (bottom panel) of the differential effect of trust on log value added and exports across industries characterized by a different intensity in delegation. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The other explanatory variables are described in the Appendix. Region and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A10: trust and firm size in Italian regions, employment weighted and iterative regression down-weighting outliers

	(1)	(2)	(3)	(4)	(5)
	Base	Factors	Institut.	RZ	Vert. Int.
	EMPLOYMENT WEIGHTED				
Trust X Delegation	8.764***	8.821**	8.304***	8.821**	8.304***
	(3.237)	(3.419)	(3.024)	(3.419)	(3.024)
College X HC int.		0.762*	0.777**	0.762*	0.777**
		(0.402)	(0.367)	(0.402)	(0.367)
Capital X Cap. Int.		-15.381***	-15.633**	-15.381***	-15.633**
		(5.582)	(6.546)	(5.582)	(6.546)
FD X ED			2.305	1.998	2.305
			(1.965)	(1.735)	(1.965)
JQ X differentiated			0.021	0.013	0.021
			(0.415)	(0.441)	(0.415)
JQ X Intangible Assets				-0.186	
				(0.173)	
JQ X Vert. Integration					0.053
					(0.097)
Observations	269	269	269	269	269
Adjusted R²	0.860	0.878	0.877	0.878	0.877
F	39.265	46.067	46.021	46.067	46.021
	ITERATIVE REGRESSION				
Trust X Delegation	4.571*	4.744*	5.065**	5.000*	5.239*
	(2.386)	(2.429)	(2.566)	(2.679)	(2.836)
College X HC int.		0.751	0.777	0.777*	0.782*
		(0.460)	(0.508)	(0.466)	(0.460)
Capital X Cap. Int.		-0.748	-0.722	-0.720	-0.696
		(4.968)	(4.874)	(5.280)	(5.125)
FD X ED			-0.447	-0.451	-0.373
			(1.258)	(1.040)	(1.141)
JQ X differentiated			0.116	0.110	0.137
			(0.571)	(0.520)	(0.524)
JQ X Intangible Assets				0.014	
				(0.106)	
JQ X Vert. Integration					0.018
					(0.058)
Observations	285	285	285	285	285
Adjusted R²	0.824	0.831	0.834	0.832	0.838
F	41.404	40.870	39.557	38.062	39.764

Notes: This table presents the results of employment-weighted-least-squares (top panel) and iterative estimates down-weighting outliers (bottom panel) of the differential effect of trust on the log of average firm size across industries characterized by a different intensity in delegation. The units of analysis are region-industry observations for 19 Italian regions and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The other explanatory variables are described in the Appendix. Region and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A11: trust and industry value added in European countries, additional results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trust X Delegation	2.682***	2.403**	2.410***	2.405***	2.398***	2.136**	2.132**
	(0.887)	(0.966)	(0.892)	(0.891)	(0.847)	(1.034)	(0.981)
College X HC int.		1.540**	1.438**	1.388*	1.537**	1.423**	1.426**
		(0.623)	(0.652)	(0.709)	(0.728)	(0.677)	(0.661)
Capital X Cap. Int.		-0.082	-0.084	-0.084	-0.101	-0.100	-0.106
		(0.109)	(0.101)	(0.114)	(0.123)	(0.112)	(0.100)
FD X ED			0.034	0.036	0.032	0.033	0.034
			(0.075)	(0.076)	(0.075)	(0.072)	(0.066)
JQ X differentiated			0.232	0.315	0.202	0.214	0.269
			(0.574)	(0.512)	(0.539)	(0.559)	(0.541)
Entry Barriers X Turnover				0.001			0.001
				(0.002)			(0.002)
EPL X Labor Intensity					0.000		0.000
					(0.001)		(0.001)
Prop. Rights Prot X Int. Assets						0.047*	0.047**
						(0.025)	(0.023)
Observations	205	205	205	205	205	205	205
Adjusted R²	0.881	0.886	0.885	0.884	0.884	0.887	0.885
F	65.643	62.643	58.740	56.698	56.829	63.973	59.903

Notes: This table presents the results of OLS estimates of the differential effect of trust on log value added across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The other explanatory variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A12: trust and industry exports in European countries, additional results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trust X Delegation	2.015***	1.672**	1.744**	1.741**	1.762*	1.823**	1.834**
	(0.771)	(0.776)	(0.839)	(0.784)	(0.907)	(0.910)	(0.867)
College X HC int.		1.972***	1.651**	1.633**	1.523*	1.629**	1.360*
		(0.675)	(0.740)	(0.784)	(0.794)	(0.744)	(0.798)
Capital X Cap. Int.		-0.154*	-0.157*	-0.156*	-0.135	-0.170	-0.132
		(0.087)	(0.082)	(0.091)	(0.117)	(0.109)	(0.110)
FD X ED			0.115**	0.116*	0.118*	0.080	0.086
			(0.054)	(0.064)	(0.063)	(0.081)	(0.076)
JQ X differentiated			0.013	0.042	0.040	0.048	0.182
			(0.424)	(0.495)	(0.426)	(0.566)	(0.600)
Entry Barriers X Turnover				0.000			0.001
				(0.002)			(0.002)
EPL X Labor Intensity					0.001		-0.001
					(0.000)		(0.001)
Prop. Rights Protection X Int. Assets						0.027	0.029
						(0.031)	(0.032)
Observations	222	222	222	222	222	207	207
Adjusted R²	0.863	0.870	0.871	0.870	0.870	0.873	0.872
F	54.600	56.262	55.343	53.374	53.363	55.586	52.161

Notes: This table presents the results of OLS estimates of the differential effect of trust on exports across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The other explanatory variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A13: trust and firm size in European countries, additional results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trust X Delegation	1.687**	1.703***	1.704**	1.702**	1.715***	1.660**	1.668**	1.642**	1.056*	1.093*
	(0.663)	(0.610)	(0.661)	(0.706)	(0.587)	(0.777)	(0.752)	(0.758)	(0.614)	(0.612)
College X HC int.		-0.097	-0.069	-0.086	-0.143	-0.065	-0.111	-0.108	0.245	0.264
		(0.545)	(0.731)	(0.651)	(0.580)	(0.627)	(0.631)	(0.632)	(0.644)	(0.598)
Capital X Cap. Int.		0.009	0.009	0.010	0.022	0.005	0.019	0.021	0.024	0.020
		(0.117)	(0.116)	(0.141)	(0.113)	(0.124)	(0.130)	(0.122)	(0.108)	(0.133)
FD X ED			-0.007	-0.006	-0.005	-0.029	-0.031	-0.031	-0.014	-0.013
			(0.064)	(0.056)	(0.053)	(0.097)	(0.077)	(0.076)	(0.085)	(0.068)
JQ X differentiated			-0.088	-0.060	-0.072	-0.357	-0.408	-0.412	-1.002*	-1.036**
			(0.427)	(0.481)	(0.379)	(0.487)	(0.496)	(0.555)	(0.540)	(0.489)
Entry Barriers X Turnover				0.000			-0.001	-0.001	-0.001	-0.001
				(0.002)			(0.002)	(0.002)	(0.002)	(0.002)
EPL X Labor Intensity					-0.000		-0.000	-0.000	-0.000	-0.000
					(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
Prop. Rights Prot. X Int. Assets						0.026	0.027	0.022	0.007	0.022
						(0.026)	(0.027)	(0.037)	(0.025)	(0.044)
JQ X Intangible Assets								0.025		-0.082
								(0.113)		(0.121)
JQ X Vertical Integration									-0.108***	-0.116***
									(0.032)	(0.038)
Observations	222	222	222	222	222	207	207	207	207	207
Adjusted R²	0.832	0.831	0.829	0.828	0.828	0.829	0.827	0.826	0.835	0.834
F	48.852	45.851	42.457	41.288	40.932	40.721	38.078	37.648	38.336	39.022

Notes: This table presents the results of OLS estimates of the differential effect of trust on the log of average firm size across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The other explanatory variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A14: trust and firm size distribution in European countries, additional results

	(1)	(2)	(3)	(4)	(5)	(6)
	log total number of firms			*by size class*		*Share of self-empl.*
				1-19	20+	
Trust X Delegation	0.907	0.710	0.078	-0.205***	1.857***	-0.136***
	(0.672)	(0.677)	(0.762)	(0.077)	(0.590)	(0.052)
College X HC int.		1.202**	1.028	-0.138	0.104	0.126**
		(0.594)	(0.696)	(0.112)	(0.440)	(0.051)
Capital X Cap. Int.		-0.137	-0.084	0.048*	-0.026	-0.005
		(0.125)	(0.103)	(0.025)	(0.070)	(0.007)
FD X ED			0.082	-0.007	-0.013	0.004
			(0.077)	(0.011)	(0.039)	(0.005)
JQ X differentiated			0.050	0.164**	-0.045	-0.025
			(0.512)	(0.074)	(0.262)	(0.032)
Entry Barriers X Turnover			0.002			
			(0.002)			
EPL X Labor Intensity			-0.001			
			(0.001)			
Prop. Prot X Int. Assets			-0.007			
			(0.023)			
JQ X Vertical Integration			-0.089**			
			(0.040)			
log number of firms				0.068***	-0.375***	
				(0.019)	(0.083)	
Observations	222	222	207	220	220	218
Adjusted R²	0.919	0.922	0.922	0.723	0.828	0.675
F	143.863	128.827	116.559	18.823	38.263	15.421

Notes: This table presents the results of OLS estimates of the differential effect of trust on average firm size and the firm size distribution across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of regional average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the European Social Survey. The other explanatory variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A15: trust and industry comparative advantage in European countries, robustness using the measure of delegation based on the INVIND survey of Italian firms

	(1) Base	(2) Factors	(3) Institutions	(4) Controls
Panel A: log of VALUE ADDED				
Trust X Delegation	6.382***	5.551***	6.168***	5.585***
	(1.680)	(1.486)	(1.524)	(1.555)
Observations	190	190	190	190
R²	0.914	0.918	0.922	0.927
Prod Factors	NO	YES	YES	YES
Institutions	NO	NO	YES	YES
Add. controls	NO	NO	NO	YES
Panel B: log of EXPORTS				
Trust X Delegation	5.626***	4.653***	5.029***	5.043***
	(1.334)	(1.542)	(1.634)	(1.830)
Observations	207	207	207	192
R²	0.897	0.903	0.905	0.908
Prod Factors	NO	YES	YES	YES
Institutions	NO	NO	YES	YES
Add. controls	NO	NO	NO	YES

*Notes***:** This table presents the results of OLS estimates of the differential effect of trust on log value added (Panel A) and exports (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The bottom part of the table indicates which additional controls are included, all the variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A16: trust and industry comparative advantage in European countries, robustness using the measure of delegation based on the INVIND survey of Italian firms

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: log of average FIRM SIZE			
	Base	Factors	Institutions	Controls	RZ	Vert. Int
Trust X Delegation	2.847*	3.018**	3.317**	3.156**	3.063**	2.874**
	(1.547)	(1.377)	(1.369)	(1.355)	(1.326)	(1.331)
Observations	207	207	207	192	192	192
R^2	0.850	0.850	0.853	0.854	0.854	0.862
Prod Factors	NO	YES	YES	YES	YES	YES
Institutions	NO	NO	YES	YES	YES	YES
Add. controls	NO	NO	NO	YES	YES	YES

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel B: Size distribution of firms			
	log number of firms			by size class		Share of
	Base	Factors	Institutions	1-19	20-49	self empl.
Trust X Delegation	3.052*	1.869	1.309	-0.315*	3.425***	-0.222**
	(1.586)	(1.262)	(1.332)	(0.182)	(1.061)	(0.098)
Observations	207	207	192	205	205	203
R^2	0.928	0.933	0.936	0.772	0.864	0.704
Prod Factors	NO	NO	NO	YES	YES	YES
Institutions	NO	YES	YES	YES	YES	YES
Add. controls	NO	NO	YES	YES	YES	YES

Notes: This table presents the results of OLS estimates of the differential effect of trust on average firm size (Panel A) and the firm size distribution (Panel B) across industries characterized by a different intensity in delegation. The units of analysis are country-industry observations for 15 European countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. The bottom part of the table indicates which additional controls are included, all the variables are described in the Appendix. Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively.

Table A17: trust, industry comparative advantage, and firm size across 66 countries, using UNIDO industry data and COMTRADE export data

	(1) Base	(2) M-estimator	(3) LAV	(4) MM-estimator
Panel A: log of VALUE ADDED (UNIDO)				
Trust X Delegation	1.991	3.343*	3.195**	3.815**
	(1.823)	(1.830)	(1.565)	(1.677)
Observations	940	940	940	940
Number. of countries	66	66	66	66
Panel B: log of average FIRM SIZE (UNIDO)				
Trust X Delegation	1.356	2.458***	1.900**	2.800**
	(0.845)	(0.950)	(0.946)	(1.086)
Observations	907	907	907	907
Number. of countries	64	64	64	64
Panel C: log of EXPORTS (COMTRADE)				
Trust X Delegation	4.243***	4.856***	4.720***	5.730***
	(1.635)	(1.462)	(1.328)	(1.365)
Observations	1187	1187	1187	1187
Number. of countries	66	66	66	66

*Notes***:** This table presents estimates of the differential effect of trust on log value added (Panel A), average firm size (Panel B), and exports (Panel C) across industries characterized by a different intensity in delegation. Data on value added and average firm size is sourced from Unido Instat 2, data on the value of exports is sourced from the UN Comtrade database. The units of analysis are country-industry observations for up to 66 countries and 15 industries, as defined according to the 2-digit International Standard Industry Classification (ISIC). The main explanatory variable is the interaction of country average trust (as measured by the World Values Survey) and an industry-specific measure of delegation-intensity, based on the INVIND survey of Italian firms. Column (1) present the results of OLS regressions, whereas columns (2) to (4) present the results of three alternative regressions techniques that are robust to the presence of influential observations: the M-estimator of Huber (1964); the Least Absolute Value regression; and the MM estimator of Yohai (1987). Country and industry fixed effects are included in all specifications. Bootstrapped standard errors based on 200 replications are reported in parenthesis; *, ** and *** denote coefficients significantly different from zero at the 90%, 95% and 99% confidence level, respectively

DATA DESCRIPTION

Industry data

Delegation$_j$	**Italian regions**: intensity in delegation. Variable estimated on the 2009 wave of the Survey on Investments of Italian firms (INVIND) exploiting self-reported number of responsibility centers, defined in the management literature as the units of the organization whose managers are accountable for a set of activities or a specific project. The variable is estimated according to the following procedure: (*a*) Regress firm-specific delegation measures *Centers$_{j,i,r}$* on region dummies, industry dummies and the log of firm size (equation 2 in the main text). (*b*) Predict *Centers$_j$* as the value of the estimated industry dummy.
	European countries: a similar procedure is applied to the degree of delegation within firms in 15 European countries as reported by workers interviewed in the first three waves (2002-2005) of the European Social Survey.
HC intensity$_j$	Industry share of college graduate in the employed population in the US in 2005 (as computed from the 2005 American Community Survey - Integrated PUMS.
Cap. intensity$_j$	Ratio between real fixed capital stock and value added (1995 prices) in the US in 2005. Source: EuKlems Database.
Differentiated$_j$	Industry intensity in relationship-specific investments, computed as the fraction of intermediate inputs that is not traded in a standardized market. Source: Nunn (2007).
ED$_j$	Industry dependence on external finance, defined as capital expenditure minus internal funds. Source: de Serres *et al*. (2006) on Thomson Financial Worldscope database.
Labor intensity$_j$	Ratio between total employment and real fixed capital stock (1995 prices) in the US in 2005. Source: EuKlems.
Turnover$_j$	Firm turnover in the US, average rate 2004-2006. Source: OECD Standard Business Statistics.
Int. Assets$_j$	Industry in intangible intensity in the US. Source: Claessens and Laeven (2003).
Vertical integrat.$_j$	Industry propensity to vertically integrate computed on US data. Source: Acemoglu et al., (2010)

Italian regional data

Trust$_r$	Average trust in region *c* in. Measured as the fraction of respondents that answers "Most people can be trusted" – answer coded with "1" as opposed to "0"- to the question "…would you say that most people can be trusted or that you need to be very careful in dealing with people?". Obtained pooling the 1990, 1995 and 2005 waves of the survey. Source: World Value Survey
College$_r$	Share of college graduates in 2001. Source: ISTAT, Population Census
Capital$_r$	Ratio between the stock of private net physical capital and employment in 2005. Source: Filippone and Montanaro (2014)
JQ$_r$	Negative log of the average length of civil trials in 2005. Source: ISTAT
FD$_r$	Financial development in region *r* measured as number of bank branches over total population in 2001. Source: Bank of Italy Statistics on Credit and Finance.
VA$_{j,r}$	Level of industry *j* real value added in region *r* in 2005. Source: INVIND data, representative of 20+ Italian firms.
EXPORT$_{j,r}$	Value of industry *j* exports from region *r* in 2005. Source: INVIND data, representative of 20+ Italian firms.
FIRMSIZE$_{j,r}$	Average size of firms in industry *j* in region *r* over in 2005. Source: ISTAT.
number of firms$_{j,r}$	Number of firms by size classes in industry *j* in region *r* in 2005. Source: ISTAT.

European data

Trust$_c$	Average trust in country c in 2005 or earlier years when unavailable. Measured as the fraction of respondents that answers "Most people can be trusted – answer coded with "1" as opposed to "0"- to the question "…would you say that most people can be trusted or that you need to be very careful in dealing with people?". Source: World Value Survey
College$_c$	Share of tertiary educated in the adult population around the mid-2000s. Source: OECD, World Indicators of Skills for Employment
Capital$_c$	Ratio between the stock of physical capital and employment in 2005. Source: Source: EuKlems Database.
JQ$_c$	Index of Quality of contract enforcement in 2005, measured as the extent to which agents have confidence in and abide by the rules of society (Rule of Law). Source: Governance Matters Indicators of the World Bank
FD$_c$	Financial development in country c measured as Private Credit by Deposit Money Banks over GDP in 2005. Source: World Bank's financial development and structure database (based on IMF's Financial Statistics).
EPL$_c$	OECD index of the strictness of regulation of individual dismissal of employees on regular/indefinite contracts in 2005. Source: OECD/IDB Employment Protection Database.
Entry Barriers$_c$	Direct start-up costs of obtaining legal status to operate a firm as a share of per capita GDP in 2005. Source: World bank Doing business (2006).
VA$_{j,c}$	Level of industry j real value added in country c in 2005. Source: OECD STAN database.
EXPORT$_{j,c}$	Value of industry j exports from country c in 2005. Source: OECD STAN database.
FIRMSIZE$_{j,c}$	Average size of firms in industry j in country c in 2005. Source: OECD Standard Business Statistics.
number of firms$_{j,c}$	Number of firms by size classes in industry j in country c in 2005. Source: OECD Standard Business Statistics.
Self-employed$_{j,c}$	Share of self employed in 2005. Source: OECD Standard Business Statistics.

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