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ABSTRACT

On the Emergence of Cooperative Industrial and Labor Relations*

We explore the long run determinants of current differences in the degree of cooperative labor relations at local level. We do this by estimating the causal effect of the medieval communes - that were established in certain cities in Centre-Northern Italy towards the end of the 11th century - and that contributed to the emergence of a cooperative attitude in the population on various proxies for current cooperative labor relations. Conditional on a large set of firm and municipality level controls, as well as a full set of province fixed effects, we find that firms located in municipalities that had been a free medieval commune in the past, have higher current probabilities to adopt two-tier bargaining structures and to be unionized. We also report IV and propensity score estimates that confirm our main results.

JEL Classification: J50, J53, J59, N00

Keywords: industrial relations, two-tier bargaining, unions, cooperation, persistence

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1 Introduction

A growing body of literature in economics, sociology and political science has highlighted the powerful role that culture, to be understood as the set of beliefs, values, rules of thumb that different groups transmit fairly unchanged across generations (Guiso et al., 2006; Alesina and Giuliano, 2015), exerts on the extent of trust and cooperation among individuals in various dimensions of life. Moreover, higher levels of trust and cooperation at local level are typically found to be positively correlated with local development through various channels, such as by fostering trade, innovation and financial development or by influencing the internal organization of firms and the labor market (Algan and Cahuc, 2014), among the others). This literature has shown that local areas where individuals tend to display higher levels of trust and cooperation are also more likely to overcome the free rider problem in the provision of local public goods. This is precisely what Guiso et al. (2016), building on Putnam (1993), call social or civic capital, i.e. the set of shared beliefs and values that help a group to overcome the undersupply of public goods, especially in the pursuit of socially valuable activities.[1]

More recently, various authors have shown that current levels of trust and social capital at local level are often the by-product of the interactions between the slow development of culture over time (Bisin and Verdier, 2001) and past institutions, wars, or other types of economic and natural shocks, as shown by Tabellini (2010), Nunn and Wantchekon (2011), Alesina and Giuliano (2015), Buggle and Durante (2021), Belloc et al. (2016), Guiso et al. (2016), among others. This strand of literature has therefore made clear that long past institutions, by affecting the evolution of social capital, trust and cooperative behavior between individuals, might still have important effects on contemporary economic outcomes.

More specifically, in the field of labor and industrial relations, Aghion et al. (2011), building on Crouch (1993), show - in a seminal contribution - that past government atti-

[1]The term social capital is associated to different definitions. In general, it combines the set of beliefs, values, rules of thumb that are found to foster trust and cooperative action. Some authors also distinguish between bonding social capital, which fosters trust and inclusiveness within a (small) group, and bridging social capital, which in turn favors collaboration across groups. See also the distinction between limited and generalized morality in Banfield (1967).

tudes towards unions might still exert a strong influence over current workers' preferences for unionization. Indeed, since participation to unions allows workers to experiment on cooperation with employers, and thus can be seen as evidence of cooperative labor relations,[2] too pessimistic beliefs about the scope of cooperation, associated to repressive attitudes of governments in some European countries at the dawn of the modern workers movement, tend to lower current incentives to join unions in the first place in those very same countries. This in turn favors an increase in the demand for tight labor market regulation. Moreover, beside by shaping the current demand for state intervention in the labor market, more trust and cooperation in the realm of industrial relations can also have additional important microeconomic effects: indeed, by influencing the bargaining process within the firm, the degree of cooperation in labor and industrial relations might have important effects on firms' investment, innovation and productivity.

In this study we follow the insights of Aghion et al. (2011) and explore the long run determinants of current differences in the degree of cooperative labor relations at local level. We do this by estimating the causal effect of the medieval communes –that were established in certain cities in Centre-Northern Italy towards the end of the 11th century– on various proxies for current cooperative labor relations for a pooled cross section of Italian firms observed over the period 2010-2018. In particular, we analyze the impact that the presence of a free commune in the late Middle Ages still has on the quality of the current system of labor and industrial relations. The latter is proxied primarily by the presence of a two-tier bargaining agreement between the firm and the workers' representatives; moreover, following the results of Aghion et al. (2011), we also consider the presence of unions (work-councils) within a firm and the level of unionization (union density) as additional proxies of cooperative labor and industrial relations.

The theoretical mechanism that we consider is that the experience of the free commune, by fostering more positive stances towards non-family members and a more proactive at-

[2]This is because the existence of a representative union can make voice attitudes more attractive relatively to exit ones.

titude to take part to the community life might have contributed to the creation of more positive attitudes towards the establishment of less-conflicting labor and industrial relations. Indeed, Guiso et al. (2016) show that, despite the disappearance of the institutions of the free medieval communes more than five centuries ago, the latter, by favoring the empowerment of individuals, might have contributed to the development of a deeper sense of civic attitudes and cooperative behavior (Alesina and Giuliano, 2015). This, by fostering trust towards non-family members (as participation to communal life necessarily involved some form of cooperation across kinship lines), may still spur current degrees of cooperative relations. Interestingly, Guiso et al. (2016) show that, conditionally on controls, Italian municipalities that had once been exposed to the experience of a free commune are today more likely to have not-for-profit institutions and organ donation organizations, while cheating in school examinations is less widespread.

Moreover, historical research (see Section 2.1 below) has highlighted that a series of local institutions like guilds, mutual associations (which provided security services and mutual aid) and Confraternite (religious associations whose main aim was to held religious festivals but also to assist the poor or the sick) have been probably spurred by the participatory experience to public life that free communal institutions made possible.[3] More importantly, these institutions have survived the formal collapse of free communes more than five centuries ago and they were still active at the beginning of the XXth century. The mere existence of these voluntary associations, which provided welfare assistance to their members and to the wider local community, might have thus helped to keep alive more participative attitudes in local communities and higher levels of generalized trust, thus instilling more positive beliefs about the workability of cooperation. In the realm of industrial relations, this might have favored on one side the formation of unions, but also a less confrontational stance between capitalists and worker representatives and, more broadly, positive beliefs in the possibility that industrial relations, like other features of social and economic life, do not necessarily

[3] See also Greif (2006).

entail a zero-sum game (Henrich, 2020). The higher levels of social capital in the local communities that witnessed the experience of the medieval free commune might therefore explain local variation in the current quality of labor and industrial relations at local level in contemporary Italy.

As mentioned above, the presence of a two-tier bargaining structure (Boeri, 2014; Cardullo et al., 2020) might provide a very good direct proxy for the degree of cooperation of labor and industrial relations within the firm. In the Italian system of industrial relations, wage floors and working conditions are generally set by sectoral bargaining at national level (first stage) and cannot generally be undone at the firm level.[4] However, the second tier agreement, at the firm level, might be used to deal with features that are not covered in the national agreement, such as the existence and structure of performance-related-pay schemes, the levels of workers training provided by firms, or to agree how to split of rents that might be associated to future productivity gains. It seems fair to say that, in a world characterized by asymmetric information between workers and firms and by imperfect contracts, two-tier agreements are more likely to be reached whenever labor relations are more cooperative and parties tend to trust each other to start with.

In this study we also explore the effect of the experience of the free communes on the presence of unions within a firm (the so called RSU and RSA, see Section 3.1) and on union density for two reasons. First, following the insights of Aghion et al. (2011), because they might both be seen as an (admittedly) imperfect proxy of cooperative labor and industrial relations. Indeed, their cross-country empirical results show that countries with higher union density are also those with a larger share of both executives and workers that report positive beliefs in cooperative industrial relations.[5] Second, because, independently from whether or

[4]But on this see Section 3.1.

[5]The literature is not unanimous about how the effects that union structures might have on the development of a cooperative system of labor relations. One one side, some scholars tend to view unions as rent-seekers, thereby leading to conflicting labor relations. Nevertheless, there is also a long-standing tradition (e.g., Freeman and Medoff (1984)) that sees unions as bodies that might favor the option value of voice over exit, thus favoring the development of cooperative labor relations, as forcefully argued by Aghion et al (2011). As far as the role of work councils is concerned, they again might help workers to have their concerns heard by managers, thus possibly favoring cooperative labor relations. However, if dominated by conflicting

not one agrees on unions as favoring the development of cooperative labor relations, the free commune experience, by increasing trust towards non-family members, might have helped to overcome the free rider problem workers face when deciding whether or not to join a union (Naylor, 1989).

In our empirical analysis we use a repeated cross section for a representative sample of firms active in the Centre-North of Italy -where the experience of the free communes unfolded- in order to assess the causal impact of social capital associated to the experience of a medieval free commune on cooperative labor relations by comparing firms in "treated" municipalities -i.e. firms that are based in municipalities that once were free medieval communes- to firms in control ones -i.e. firms that are based in municipalities that were not medieval free communes. The identification assumption is that, conditionally on a rich set of firm level controls, industry fixed effects, municipality controls as well as province fixed effects, the presence of a medieval free commune is exogenous, i.e., not correlated to unobserved time invariant municipality characteristics that might explain both the establishment of a free commune and current propensity to unionize and more generally to establish cooperative labor relations. The inclusion of province fixed effects ensures that the identification is achieved by comparing firms in treated and control municipalities that are located within relatively small local areas; moreover, we include additional controls for the current economic conditions of the municipalities, as well as for both geographic characteristics and proxies for the level of economic development of the various municipalities at around 1300 C.E..

However, because one might not completely rule out the existence of such unobservables at municipality level, we also pursue an additional identification strategy. We follow Guiso et al. (2016) and we instrument for the free medieval commune using a dummy variable equal to one for those municipalities that used to have a bishop before the establishment of the free commune. Indeed, as shown by Guiso et al. (2016), who relied on history research on the origins of Italian free medieval communes, bishops acted as a sort of commitment device

unions, this mechanism might become mute. Indeed, Addison and Teixeira (2019) found that, in Germany, work councils are associated to lower strikes, provided they are not unionized.

for the different layers of civil society that gave rise to the sworn pact which created the commune in the first place. Moreover, we deal with the possibility that firms self-select into municipalities combing both an OLS and IV approach with propensity score matching.

Again, we find that being exposed to an area whose culture and attitudes still reflects the participatory behavior, cooperation and trust favored by the experience of the free medieval commune, tends to significantly increase the likelihood that two-tier bargaining agreements are signed at the firm level as well as to foster unionization, through the set up of union representation and through higher union density, thus contributing to the development of cooperative industrial relations.

This study speaks to different strands of literature, which are surveyed in more detail in the Online Appendix A. First, our paper is related to the very large and growing literature on the long run effects of culture and institutions (and their interplay) on current individual behavior (Alesina et al., 2015; Tabellini, 2010; Belloc et al., 2016; Algan and Cahuc, 2014; Voth, 2021).[6] Second, this paper contributes to a small subset of this literature on the long run effects of culture and institutions, namely the very few studies that have explored the role of past formal and informal institutions in shaping the current systems of labor relations, such as the family Alesina et al. (2015) or political history, as in Aghion et al. (2011) and Müller and Philippon (2011).[7] In particular, with respect to Aghion et al. (2011) , we make a step further by arguing that cooperation in industrial and labor relations might arise out of more long-term implicit rules that favor cooperation among the individuals living in particular local areas; in other words, the origin of the current quality of labor relations might be embedded in the trust endowment and, more broadly, in the social capital of local areas. More importantly, we use additional proxies for cooperative labor relations; indeed, unlike Aghion et al. (2011), that focus on union membership, we use firm level data and consider

[6] See also Bisin and Federico (2021).

[7] This paper is also related to the literature on the determinants of union membership (Farber et al., 2021) and, in particular, on the role that past unionism traditions play in shaping current unionization attitudes in local communities (Bryson and Davies, 2019), among the others). Finally, the paper is related to the literature on two-tier bargaining arrangements (Boeri, 2014).

the presence of unions within a firm as well as union membership, but also the existence of a two-tier bargaining agreement, which is clearly a superior proxy for the existence of cooperative labor relations, especially with respect to surveys conducted on samples of top executives of multinational firms, as in Müller and Philippon (2011) but also in Aghion et al. (2011) .

The remainder of this work is organized as follows. Section 2 discusses the historical background and details the transmission mechanism. Section 3 presents the institutional background and discusses the data, while section 4 contains the identification strategy. Finally, section 5 provides the empirical results and section 6 concludes. The Online Appendix contains both a more structured review of the literature and further additional results.

2 Historical Background and Transmission Mechanism

2.1 The Italian Medieval Commune and Its Offspring

During the 10th century Western Europe witnessed a spur in urbanization. In that period, the declining influence of the Holy Roman Empire, was filled by the bishop (if he was present in the city) together with a small assembly of *boni homines* (literally, good men) (Montesano, 2007). Things began to change in the middle of the 11th century, when the upper classes in Northern Italy attributed themselves greater autonomy in the management of the city. This process was not possible in Southern Italy where the invasion of Normans between 1061 and 1091 led to the creation of a strong central authority.

The first documentary evidence of a free commune in Italy goes back to the end of the 11th century. Initially, the city was run by a small assembly of consules, who were the expression of the urban elite. It is important to note that the elite and the ordinary people were quite permeable, so that *minores* could climb the social ladder and become part of the elite. The period between 1158 and 1183 constitutes a defining moment in the conflict between the Emperor Frederick I -who tried to regain power- and the Italian communes. In particular,

the Emperor's defeat the battle of Legnano in 1176 persuaded Frederick I to award a series of prerogatives to the communes.

After the end of this period, the remarkable improvement in population and living conditions increased social tensions and the solution in most communes was the appointment of a *podestà*, a professional politician chosen outside the city, with a one-year mandate to run the government, whose behaviour was however controlled by an assembly. The political system became however more complex, as the number of city stakeholders increased: corporations, compagnie d'armi (militias), *mercanzie* (confederation of corporations, from the 14th century) all put forward their interests and political and economic agendas, sometimes reaching mutually beneficial agreements, in other cases provoking overt conflicts (Artifoni, 1990). It is important to stress that the growing importance of corporations and other intermediate bodies within the urban civic life was a characteristic feature of the free-cities in Northern Italy (Greci, 1995). In the Southern regions, under the Norman rule, corporations were less present and less strong, confirming the hypothesis that the autonomy of the communes was a crucial breeding ground for the proliferation of such a variety of interest groups.

The excessive fragmentation of the political system was in some cases the main cause of the end of the communal age and the advent of the Signoria (govern of the lord or *Signore*), which occurred during the 14th century. In most cases, the *Signore* was no longer under the control of the communal assemblies and statutes. Still, it was explicitly expressed that his power came from the people's decision. Only in the late14th and early 15th centuries, the Signorie were transformed in principalities, in which the ruling dynasty exercised its power thanks to the explicit recognition of the Empire or the Church, and the main political entity was no longer the city but the regional state.

Nevertheless, the most recent historiography (Chittolini, 1989) tends to emphasize the continuity between the communal age and the principalities. The formation of a system of regional states, which often took the form of principalities, did not mean that cities decayed in the face of rising states. Although the remarkable trajectory of the independent city-state

came to an end almost everywhere, its heritage still left a strong imprint on the Renaissance political order".

2.2 Transmission Mechanism

How is it possible that a historical event occurred almost one thousand years ago may explain the geographical disparities for some relevant industrial relations variables in present day Italy?

Our hypothesis is that the free city experience was the breeding ground for the development of those social skills and that kind of civic engagement that are the necessary ingredients for an active and participated system of industrial relations. Indeed, the free commune system can be viewed as an agglomeration of different interest groups, sometimes in overt conflict with each other, but often in search of mutual agreements. For interest groups we mean all those "intermediary institutions" representing the stances of fractions of the population, but distinct from the formal branches of the communal government: indeed, limits on the abuse of power by the sovereign come not only via the division of state functions but also through the mitigating role played by such autonomous entities (Urbinati, 2015). It is well known that such institutions prospered in the communal system, whereas their importance was much limited in the Southern parts of Italy, under the Normans rule (Greci, 1995). This was not by chance, but precisely because of the relative autonomy they could enjoy in the communes compared to the centralizing power of the Normans.

The most prominent examples of intermediary institutions were the merchant and craft guilds. While part of the literature has taken an essentially negative view on the latter, some recent research has re-examined their contribution to the economic progress in medieval and early modern Europe, in terms of innovation, technological change and entrepreneurship (Epstein and Prak, 2008), as providers of public goods and as welfare institutions. The growing relevance of the guilds within the free-cities is recognized by many scholars, that identify the 13th century as the period when they ceased to be organizations just operating

in the product and labor markets and become a linchpin of the communal political system (Artifoni, 1990).

Under this lens, it seems reasonable to assume that individuals living in the communes became more conscious of the advantages of being part of an association and that this propensity to affiliate persisted over the centuries, even after the dissolution of the free-city experience.

This argument holds even for other intermediary bodies that either originated in or gained strength under the free-city period. The *compagnie d'armi* or *società d'armi* were militias composed by residents of the city whose original goal was to protect the commune against invasions. The Italian philosopher and politician Antonio Gramsci was one of the first scholars that emphasized the relevance of such militias as social aggregator (see (Gramsci, 1975)). Indeed, the war against the emperor in the second half of the 12th century had forced the enlistment of many citizens of lower classes.

The repeated battles helped to create a team spirit that remained even in periods of peace. Thus, especially during the 13th century, the *società d'armi* became one of the vehicles for the participation of the plebs to the governance of the Commune. Interestingly, Gramsci observed that in the modern states that came after the dissolution of the communal era the exercise of power was more centralized, but that the variety of organizations and institutions active in that period did not disappear completely: "The Modern State [...] abolishes certain autonomies, which nevertheless are reborn in other forms, as parties, trade unions, and cultural associations" (Gramsci, 1975).[8] Other organizations that gained importance in the communal era were the *confraternite*, religious associations whose primary tasks involved charity for the needy, education activities, and health assistance for its members.

In conclusion, it is clear that the relevance and the diffusion of these organizations differed across cities. If establishing a direct causal link (in both directions) between the formation of the free communes in Northern Italy and the emergence of intermediary institutions is not certain, the historiography broadly agrees on the fact that the Communal institutions and

[8] Gramsci (1975) also noted that "Communes were therefore a trade union kind of state, that never succeeded in overcoming this phase to become a fully-fledged one, as Machiavelli vainly indicated".

such entities reinforced each other. Our theoretical mechanism indicates that the willingness to engage in the civic life by promoting your own interests and points of view persisted over centuries, remained under the surface during more authoritarian periods and are still discernible today once we look at the level of cooperation of labor and industrial relations.

3 Institutional Background and Data

3.1 The Industrial Relation System in Italy

The Italian industrial and labor relations system presents a two-tier bargaining (TTB) structure, with a relevant sectoral tier and a supplementary decentralized tier where bargaining is usually realized at the company/local level (Devicienti et al., 2017). The first level of bargaining is the national collective one, with contractual labor agreements that extend virtually *erga omnes* at the sectoral level: it sets minimum wages schedules and work standards at the industry-level, and is targeted to preserve the purchasing power of wages. The second level is the decentralized one, with firm (or establishment) level agreements that supplement the national collective contracts: it negotiates additional components of wages and other regulatory aspects, and is linked to firm's economic performance. Firm-level agreements are not allowed to prevail on national collective contracts, that represent the floors in terms of wage agreements and working conditions.[9]

Recent estimates on the diffusion and content of second level bargaining show that the coverage ranges between 15 to 25 percent of firms and about 60 percent of employees, with a prevalence in the case of manufacturing and larger firms (Damiani and Ricci, 2014). The majority of second-level agreements regards wage increases related to productivity gains (60%), while agreements containing workplace organizational changes, performance-based human resource management practices and employment flexibility are related to the remaining 40%

[9] An exception applies in the areas of economic distress, where local-level bargaining has the possibility to derogate from higher-level agreements to preserve employment levels, improve job quality or fight undeclared work (D'Amuri and Giorgiantonio, 2014).

of cases (Damiani and Ricci, 2014; Devicienti et al., 2017). Boeri (2014) shows that two-tier bargaining covers about 50% of firms with more than 200 employees in Europe, while such percentage is about 20% for firms below 50 employees.

Union presence at the firm level takes place through somewhat different forms. On the one hand, traditional union representation emerges through union membership, with a proportion of employees being union members. On the other hand, union representation is also related to the presence of RSA (Rappresentanze Sindacali Aziendali) or, more recently, RSU (Rappresentanze Sindacali Unitarie). As discussed in the literature (Cardullo et al., 2020; Devicienti et al., 2017), although RSA and RSU are quite similar to traditional work councils along some dimensions (voting on their set-up is attributed to all workers at the firm level, independently on union status), on the other hand they have some peculiar characteristics that can make them closer to traditional union representation bodies. As an example, members elected in RSA/RSU boards are chosen from different lists provided by the most representative union organizations at the local and national level, turning into a very strict connection between union representatives and these bodies. Moreover, although firm level two-tier agreements can be signed by RSA and RSU, this process also involves local union representatives within the framework of the national collective agreements. Still, two-tier bargaining may also take place at the firm level without considering union representatives.

3.2 Data

The empirical analysis is based on the last three waves of the Rilevazione su Imprese e Lavoro (RIL) conducted by INAPP (the Italian National Institute for Public Policy Analysis) in 2010, 2014 and 2018 on a large representative sample of partnerships and limited liability firms operating in non-agricultural private sector. A subsample of the included firms (about 35%) is followed over time, making the RIL dataset partially panel over the period under study.

This data provides a rich set of information on industrial relations at workplace. Most

important to our purposes, RIL data provides detailed information on agreements on second level (two-tier) bargaining, trade union presence (RSA/RSU) and union density, defined as the ratio between the number of unionized workers over the total number of employees. We also take advantage from the rich set of information provided by the RIL survey on management and corporate governance, workforce characteristics and firms productive specialization (see Section 5).

Out of the overall data source, we excluded firms with less than 10 employees, where second level bargaining and other measures of industrial relations are relatively unstructured. In Table 1 we provide descriptive statistics for the variables of interest, i.e., our dependent variables and main controls.

Data at municipality level come from Guiso et al. (2016). We refer to their study for detailed explanations regarding the creation of each variable. Here we briefly explain how the main variables of interest are derived. In particular, following the original source, we define as free communes those municipalities that were independent in 1176. In our sample, as reported in Table 2, about 31% of observations refer to firms that are currently located in municipalities that were a free-commune in the past. Remaining controls refer to urbanization dummies in 1300, geographic location dummies and finally, modern characteristics of the municipalities, such as population levels and Gini inequality index measured as of 2001.[10] In Figure 1 we provide a map with details on the main variable of interest, the free commune.

4 Identification

We seek to identify the long-term causal effects of the experience of the medieval free commune on current quality of the system of industrial relations in a representative sample of Italian firms in the Centre-North (where free medieval communes developed) by comparing selected features of the system of industrial relations in firms that are located in "treated

[10] As we will explain in the Identification section, in some specification we adopt an IV strategy, using the presence of a bishop as instrument for free-commune.

municipalities" -i.e. those municipalities that experienced a spell of free commune in the late Middle Ages- with those that, in turn, characterize similar firms that are however located in "control municipalities" -i.e. those that never experienced a spell of a free commune in the Middle Ages. We exclude firms in the South of Italy because in that area the municipality experience did not take place.

The identification strategy involves the estimation of the following equation by OLS:

$$IR_{impt} = \alpha FC_{mp} + \beta X_{impt} + \theta M_m + u_p + u_t + v_{impt} \quad (1)$$

where i indexes firms, m municipalities, p provinces and t the RIL waves 2010, 2014 and 2018, respectively. As already discussed, the sample is a repeated cross section with a panel component, i.e. a fraction of the sample is made up by firms that are observed over the three waves.

More specifically, the dependent variables IR may represent, alternatively i) a dummy taking the value of 1 if firm i, located in municipality m and province p in wave t is recorded as having a second level agreement, ii) a dummy indicating whether a formal union representation is in place at the firm level and, iii) the percentage share of unionized workers over total employment. FC is equal to 1 if firm i, in province p, is located in a municipality m that was exposed to the institutions of a free commune in the late Middle Ages.

Moreover, X is a vector of firm level controls, which capture firm level differences in corporate governance, management characteristics, workforce composition and firm productive specialization, besides a full set of industry and year dummies. In turn, M represents a vector

of some historic,[11] geographic[12] as well as modern [13] characteristics of the municipality m where firm i is located.

Finally, u_p represents a full set of province fixed effects capturing the province where each firm is located during wave t, u_t includes year fixed effects, while v_{impt} is an error term. The inclusion of the province fixed effect[14] controls for any time invariant heterogeneity at the province level, which in turn ensures that identification of (1) is achieved by comparing firms in treated and control municipalities that are located within the same province, thereby effectively controlling, e.g., for historic differences in past local institutions which might still affect current institutional quality,[15] or by regional specific shocks that might have affected trust and institutional development.[16] Moreover, the historic, geographic, and current municipality controls should capture, within any given province, possible heterogeneity among municipalities, while firm level controls are supposed to take into account possible differences among firms.

As noted above, the identification assumption is that firms in untreated municipalities represent a valid counterfactual for those located in treated ones. The inclusion of the mu-

[11] We consider dummy variables for whether municipality m was a large or medium town as of 1300, as in Guiso et al. (2016). These two dummies proxy for historic urbanization, which is considered a good proxy for per capita incomes in the Middle Ages. As a result, these dummies are meant to capture possible unobservables that might have explained both the establishment of a free commune in the Middle Ages as well as the long run patterns of growth that might be correlated with the current quality of firm level industrial relations. Ideally, one would need city size as of 1000 C.E., when most communes were established; unfortunately, the information as of about 1300 is as far as back that one can go. It is interesting to note that Bosker et al. (2013) show that, all over Europe, the establishment of a free commune was not correlated to initial city size. However, they also show that the presence of a commune was associated to stronger future population growth. This suggests that controlling for city size as of 1300 should be enough.

[12] We consider a dummy for whether the municipality is near to the sea, its altitude as well as a dummy for costal municipalities. These geographic characteristics can be considered proxies, among the others, for the trade potential of a municipality, which in turn can foster trust and cooperative behavior. See also Bosker et al. (2013).

[13] We consider predetermined modern characteristics of the municipalities, such as population levels and the Gini index of inequality, both measured as of 2001.

[14] Italy is currently divided into 110 provinces, with populations ranging from 70 thousand people to 3.7 million people (average about 0.5 million).

[15] For instance, Di Liberto and Sideri (2015) use province-level data and found that the current public administration quality is significantly influenced by the quality of past local institutions associated to the past dominations that prevailed in Italy in the XVI and XVII centuries.

[16] Buggle and Durante (2021) find that European regions which were characterized by more significant climate variability before the industrial revolution are characterized by higher current levels of trust.

nicipality controls as well as of the province fixed effects are therefore precisely meant to make the identification assumption more credible. Nevertheless, one might still argue that FC_{mp} is capturing local unobservables, even within the same province, that drive both the establishment of a free commune and the current quality of industrial relations. For instance, some Italian municipalities were important trade centers during the Middle Ages: if trade is associated to more development, and this brings with it more trust and civic engagement, then one might find better quality industrial relations in "treated" municipalities, but independently from the effects brought about by the institutions of a free commune.[17] Moreover, one might also argue that firms self-select into municipalities that used to be medieval communes because of individual characteristics that are correlated with a more positive attitude towards cooperative labour relations. In both cases, the identifying assumptions in equation (1) would be violated and we should not give a causal interpretation to our empirical estimates. Therefore, we consider two other approaches.

First, we run the OLS regressions after performing propensity score matching (PSM). Using PSM technique is expected to combine a group of "treated" firms – located in a free Medieval commune - with a group of "untreated" firms having similar observable characteristics in terms of management, workforce composition and productive specialization. This control group is then used to estimate the counterfactual effects of the free Medieval commune on our measures of industrial relations. In other words the rationale of this approach is that, by taking into account selection into "treatment", we should be more likely to compare firms in treated municipalities with a control group of firms located in municipalities that was not free commune in Middle Age and that are as similar as possible to the former along a large set of observed dimensions; this in turn should hopefully take into account possible concerns related to firms self-selection issues.[18]

[17] We control for proxies of per capita income as of 1300 C.E., as well as for geographic characteristics that might have favored trade in the middle ages, like location near the coast, but the controls are clearly imperfect.

[18] We proceed as follows. In order to adjust for observable differences between the treated and untreated firms, the matching procedure consists of running a pooled logit model to estimate those observable factors that are expected to affect the probability of being located in a Medieval Comune, i.e. of being "treated"

Second, we also perform an IV approach, following Guiso et al. (2016): indeed, according to many historians, the emergence of a commune was more likely in cities that were already seats of a bishop. This is because bishops were usually the guarantors of a sworn pact between prominent citizens that stood as the linchpin of the free commune state. Moreover, bishops could punish the pact breakers with the exclusion from the religious communion. Interestingly, Guiso et al. (2016) find that current social capital is positively associated to the presence of a bishop before the year 1000 C.E. only in the Centre-North of the country, i.e., where free communes arose. Authors interpret this lack of correlation between today's social capital and the presence of an early medieval bishop in the South of Italy (where no room for a greater autonomy at city level was possible under the rule of the Normans) as suggestive that the exclusion restriction for using the existence of a bishop as an instrument for FC in equation (1) may be likely to hold. In other words, the identification assumption that we make is that the presence of a bishop around the year 1000 C.E. affects today's quality of industrial relations only because it favored the establishment of a free commune in the late Middle Ages, and not directly.[19] Finally, we combine the two approaches (i.e. IV after performing a propensity score approach); this provides a robust estimator in the spirit of Smith and Todd (2005) which should perform reasonably well in addressing identification threats stemming from local unobservables and firms self-selection into former Medieval communes.

over the period 2010-2018. In detail we implement the propensity score matching using the nearest-neighbor method with replacement. This allows us to keep only observations that are in the common support, i.e to drop treatment observations whose propensity score is higher than the maximum or less than the minimum propensity score of the controls. Finally, to assess the quality of the matching, we also check the differences between the mean value of the variables which are used to match the treatment and control groups for each outcome variable.

[19] In particular, in the case of heterogenous treatment effects, the IV estimation of equation (1) should deliver an estimation of a Local Average Treatment Effect, i.e. it should identify the effect of the free communes on cooperative industrial relations in firms located in municipalities that became free communes because of the original presence of a bishop (the so called compliers).

5 Results

We set the scene in column [1] of Table 3 with a parsimonious specification that includes, for the entire set of our dependent variables reported in panels A, B and C, as main regressor a dummy equal to 1 for those firms located in a municipality where a free-commune was present in the Middle Ages. In this specification we also include (arguably exogenous) baseline controls as province, year, sector fixed effects and a quadratic in employment. We find that the experience of a spell of free commune in the late Middle Ages for firms located in the Centre-North of Italy is positively associated to the current probability of having a two-tier agreement in place and to the presence of unions (work councils). Interestingly, results also suggest that the free commune experience is also related to traditional measures of union strength, as in our case, union density. The coefficients of interest in column 1, panels A and B of Table 3 are broadly similar and statistically significant at conventional levels, suggesting that two-tier agreements are mostly signed in firms with unions and that the two regressions are broadly capturing the pattern of emergence of cooperative labor relations.

We augment the set of controls in order to check the robustness of our main results in column 2 of Table 3. In particular, we consider the possibility that some municipality level characteristics may have impacted both on the probability of the emergence of a free-commune in the Middle Ages and on the quality of current industrial relations today. On the one hand, we consider the role of geographic and modern municipality characteristics as the current population levels and Gini inequality index that, again, may be correlated to the emergence of high quality labor relations. On the other hand, we include other municipality levels controls (geographical location, historical population, among the others) that may impact both the establishment of a free commune in the Middle Ages as well as the long run patterns of growth that might be correlated with the current quality of firm level industrial relations. The inclusion of the two sets of controls does not change the overall picture: firms located in municipalities that in the Middle Ages experienced a free-commune have higher probabilities of experiencing cooperative labor relations in terms of

two-tier agreements, presence of unions (work councils), and union density. The coefficients of interest are of similar magnitude with respect to our previous parsimonious specification, although the statistical significance is barely reduced, in particular for the regressions where the dependent variable is union density.

In order to control for additional firm level characteristics that may impact on the emergence of cooperative labor relations today, in column 3 of the same Table, we augment our models with a set of firm level characteristics. We include managerial demographic characteristics (age and gender of the manager), workforce composition (shares of workers by education, gender, type of contracts, share of immigrants, main occupations etc.), firms' productive characteristics (export in foreign markets, trade agreements, (log of) sales per employee, innovation and multinationals dummies). Of course, this set of controls might be endogenous, and a bad control problem might arise with our estimates. Reassuringly, our coefficients of interest are barely changed, suggesting that the size of the effect is not driven by the inclusion of such controls. If any, the statistical significance of our estimates improves with the respect to the previous set of regressions.[20] The fact that the step-by-step introduction of a such rich set of controls leaves the impact of the free commune on our proxies for current cooperative industrial relations barely unaltered is clearly reassuring, and possibly suggests that unobservables might not be very important in our identification setting.

As far as the magnitude of the coefficients is concerned, we note that the impact of the free medieval commune is quite important, especially in the case of the two-tier bargaining. Indeed, our results suggest that being located in a municipality that used to be a free medieval commune is associated to an increase of about 3.3 per cent on the probability that a two-tier bargaining agreement exists in a given firm. This is a quite large effect if we consider that, in our sample, such agreements exist in just 11 per cent of our firms. In the case of the two other proxies of cooperative industrial and labor relations, the magnitude of the effects is

[20] In Tables not reported, but available from the authors upon request, we run the same regressions on the sample of firms located in the municipalities in the North of the country, thus excluding those located in the Center. Results are confirmed.

perhaps slightly smaller but not negligible.

As discussed in the Identification section, although our OLS estimates control for a large set of current and past observable characteristics both at the firm and municipality level, there still could be some unobservable characteristic that may be positively correlated to our main regressor of interest, i.e. the dummy for being a free commune in the Middle Ages. In that is case, our OLS estimates cannot be given a causal interpretation of the effect of free commune on the quality of industrial relations. Hence in Table 4, we report the results for our IV estimates in which we instrument the dummy for the free commune with a dummy equal to one for the presence of a bishop in the past. While we extensively discussed the rationale for using such instrument in previous sections, here we just mention that the emergence of a commune was more likely in cities that had a bishop in place. Our first stage estimates, that are reported at the bottom of the Table, confirm our expectations. Indeed, the bishop dummy is positive and highly statistically significant; second, standard test for identification suggest that we do not have a weak identification problem.[21]

Results from our IV regressions, reported in Table 4, confirm our main OLS results, both for the more parsimonious specification reported in columns [1], [3] and [5] and for the fully saturated model with the entire set of controls and fixed effects reported in columns [2], [4] and [6].[22] This is true for the three dependent variables used as proxies of high quality cooperative industrial and labor relations. The estimated effects for our IV are larger than the OLS ones. For example, the estimated coefficient for the presence of a two-tier agreement at firm level is equal to 0.093 (against 0.033 obtained in the OLS regressions).[23] This somewhat larger effect in the IV estimates might suggest that OLS are downward biased, possibly because of, e.g., some local unobservables at municipality level that favored the birth of a medieval free commune but that currently discourage cooperative labor relations. Nevertheless, it is

[21] Complete first stage results are available from the authors upon request.

[22] The parsimonious specification corresponds to the OLS estimates reported in column 1 of Table 3, the fully saturated one corresponds to column 3 of the same Table.

[23] We also run our IV regressions on the sample of firms located in the North, thus excluding those located in the Centre of Italy. Again, our main results are confirmed.

important to recognize that OLS and IV might be estimating different average treatment effects: indeed, IV estimates should identify a local average treatment effect, namely the effect of the free medieval commune on compliers, i.e. firms located in those municipalities that become a free medieval commune precisely because of the presence of a bishop. If the effect of the free medieval commune experience is heterogenous across locations, then it is possible that the local average treatment effect is different from the average treatment effect estimated by OLS.

Finally, in order to take into account possible problems of selection into treatment, we run our OLS and IV estimates after running propensity score matching. This allows us to find a group of treated municipalities who are similar to the control group in all relevant characteristics; the only difference being that one group was exposed to the treatment, whereas the other group was not. Results are reported in Table 5. For the entire set of our dependent variables, the estimates reported for the matched sample are in line with those reported in previous Tables both for OLS and IV regressions. In particular, the estimates reported in column 1 show that firms located in a municipality that in the Middle Ages was a free commune have about 5 per cent higher probability of adopting a two-tier bargaining scheme (our OLS estimates was equal to 3.3 percent), whereas estimates for the IV regressions reported in column 2 for the same dependent variable are almost identical to those reported in column 2 of Table 4 (9.8 against 9.3).

6 Concluding Remarks

In this paper, we have explored the long run determinants of the emergence of cooperative labor relations. Indeed, a large literature has documented that high levels of trust and cooperative attitudes are positively correlated to development along various dimensions at local level. Moreover, current levels of social capital are found to be highly persistent over time, with a key role for historical institutions to explain current levels of trust and cooperation.

We provide empirical evidence on the emergence of cooperative labor and industrial relations using Italian data for a sample of firms observed over the period 2010-2018. We find that, conditional on a large set of observable characteristics at the province, municipality and firm level, higher levels of trust and cooperation in the past (proxied by the presence of a free commune in the Middle Ages) are positively correlated to cooperative attitudes in the labor market today. In particular, we find a positive relation with the presence of second-level bargaining agreements at the firm level and with different proxies for the presence of unions.

We also complement our main empirical results using an instrumental variable strategy and propensity score methods. Consistently with Guiso et al. (2016), we find that the emergence of a free commune was more likely in cities that were already seats of a bishop. Our IV estimates confirm our main findings of a positive relation between the free commune experience and current cooperative labor and industrial relations. Results are also confirmed when taking into account possible selection effects using propensity score matching.

Further research may investigate if the long run effects of the Medieval communes might also indirectly impact on the system of industrial relations by affecting also corporate governance arrangements (e.g., the diffusion of family firms and the selection of external managers), as the latter might contribute to shape the degree of cooperation of the former.

Tables and Figures

Table 1: Descriptive statistics at firm level

Variable	Obs	Mean	Std. dev.	Min	Max
	dependent variables				
two-tier bargaining	25,888	.1090074	.3116546	0	1
union presence (work councils)	24,957	.2033223	.4024784	0	1
union density	25,457	.0676839	.1623593	0	1
	management characteristics				
age>50	25,888	.3467297	.475938	0	1
34<age<50	25,888	.2526009	.4345124	0	1
age<35	25,888	.0563157	.2305349	0	1
female	25,888	.1219574	.3272429	0	1
	workforce characteristics				
share of tertiary educ	25,888	.1099216	.1885081	0	1
share of upper sec educ	25,888	.4631837	.2800898	0	1
share of lower/no educ	25,888	.4268921	.3187764	0	1
share of female	25,888	.3526388	.2619204	0	1
share of immigrants	25,888	.0723473	.13483	0	1
share of fixed-term contracts	25,888	.1421888	.2041153	0	1
share of executives	25,888	.0413438	.0893331	0	1
share of white collars	25,888	.3585844	.298651	0	1
share of blue collars	25,888	.6000707	.3230275	0	1
	firms characteristics				
multinationals	25,888	.0329439	.1784932	0	1
product innovation	25,888	.4285004	.494871	0	1
process innovation	25,888	.3852099	.4866543	0	1
foreign markets	25,888	.3462939	.4757974	0	1
trade agreements	25,888	.1560056	.3628676	0	1
ln sales per empl	25,888	11.74127	1.264963	.0895499	16.65808
employment	25,888	45.5622	350.3771	10	144624

Note. Our calculations on RIL 2010-2014-2018 sample data. Two tier bargaining is a dummy equal to one for firms with a two-tier agreement in place; Union presence (work councils) is a dummy equal to one for firms with a RSA/RSU in place (see Section 3.1 for details); Unions density is the ratio between union members over total employees. Management characteristics are dummy variables reported in the Table. Shares are calculated at the firm level over total employees. Multinationals, product innovation, process innovation, foreign markets, trade agreements are dummies. Note: sampling weights applied.

Table 2: Descriptive statistics municipality level

	Mean	Std. Dev.	Min	Max
free commune	0,31	0,46	0	1
medium pop.	0,03	0,18	0	1
large pop.	0,25	0,43	0	1
costal	0,17	0,38	0	1
near the sea	0,01	0,13	0	1
altitude	0,15	0,17	0	2,04
population 2001	0,32	0,61	0	2,55
gini inequality	0,41	0,04	0,30	0,61
N of obs	25,888			

Note. Source of data: Guiso et al. (2016). Free commune is a dummy equal to one for municipalities that experienced a free-commune in the Middle Ages. Medium and large population are dummies for population size in the Middle Ages. Coastal, near the sea and altitude are geographic dummy variables. Population 2001 is expressed in millions inhabitants and rounded. Gini income inequality index varies at municipality level.

Table 3: Main Results

	[1]	[2]	[3]
panel A: dep. var. two-tier bargaining			
free commune	0.040***	0.036**	0.033**
	[0.009]	[0.015]	[0.014]
obs	25888	25888	25888
panel B: dep. var. union presence (work councils)			
free commune	0.034***	0.040***	0.043***
	[0.010]	[0.015]	[0.014]
obs	24957	24957	24957
panel C: dep. var. union density			
free commune	0.010**	0.014*	0.016**
	[0.004]	[0.007]	[0.007]
obs	25457	25457	25457
controls			
employment	yes	yes	yes
year, sector, province FEs	yes	yes	yes
municipality controls	no	yes	yes
firms characteristics	no	no	yes
workforce characteristics	no	no	yes

Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: in Panel A it is a dummy equal to one for firms with a two-tier agreement in place; in Panel B it is a dummy equal to one for firms with a RSA/RSU (union representation) in place; in Panel C it is the ratio between union members over total employees. Controls at the bottom of the table refer to regressions in panels A, B and C. All regressions control for number of employees, number of employees squared, sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the firm workforce by education, gender, contractual arrangements, occupation and citizenship. Standard errors clustered at municipality levels in parentheses.

Table 4: Instrumental variables estimates

	[1]	[2]	[3]	[4]	[5]	[6]
	two-tier bargaining		union (work councils)		union density	
free commune	0.061***	0.093***	0.035***	0.031	0.016***	0.043**
	(0.012)	(0.034)	(0.013)	(0.035)	(0.006)	(0.017)
controls						
employment	yes	yes	yes	yes	yes	yes
year, sector, province FEs	yes	yes	yes	yes	yes	yes
municipality controls	no	yes	no	yes	no	yes
firms characteristics	no	yes	no	yes	no	yes
workforce characteristics	no	yes	no	yes	no	yes
Obs	25857	25857	24928	24928	25429	25429
	first stage statistics					
excluded instrument						
bishop	0.651***	0.329***	0.647***	0.328***	0.649***	0.328***
P-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Weak identification F	262.65	43.03	254.43	42.43	259.03	42.60
P-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

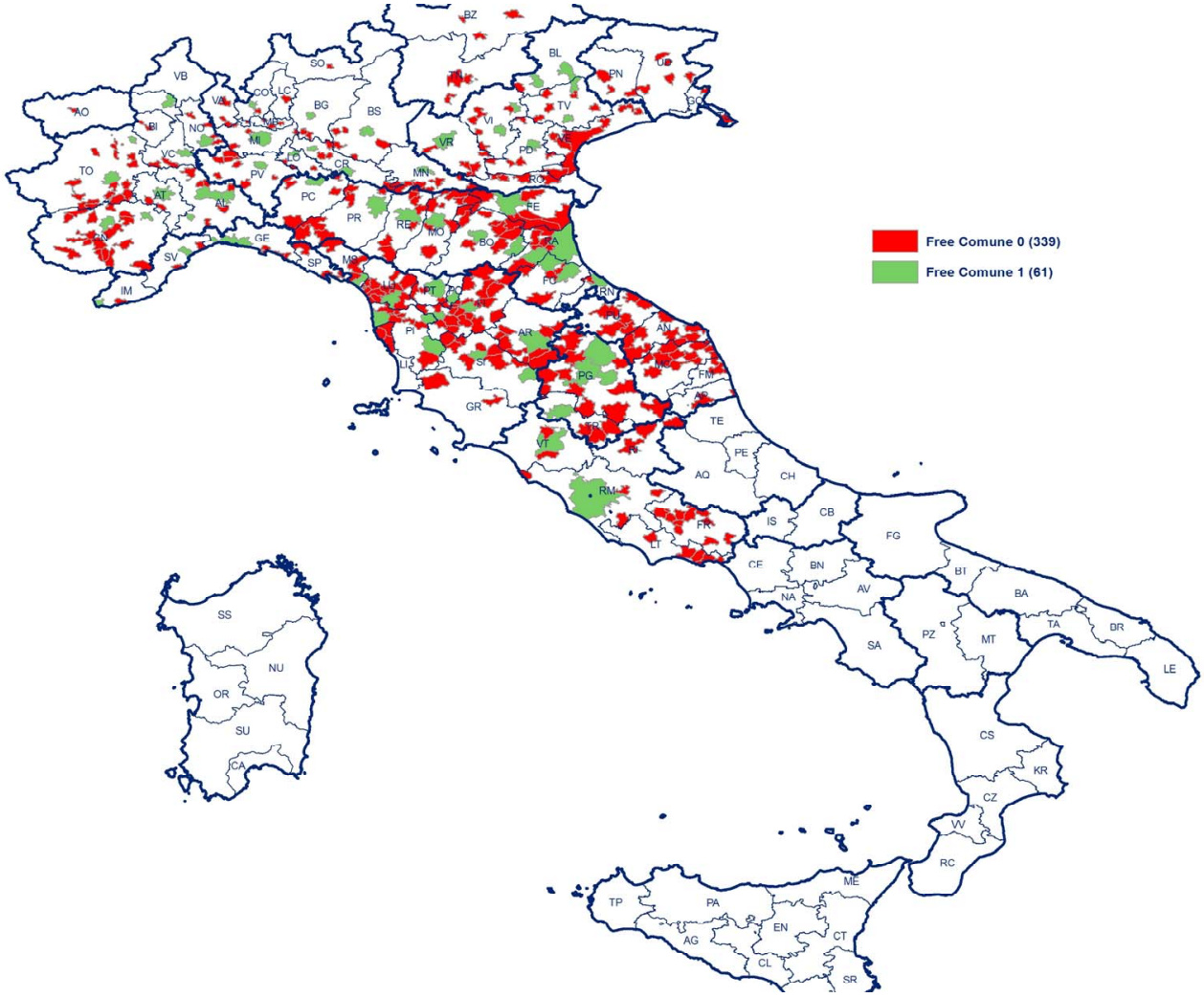
Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: in Columns 1 and 2 it is a dummy equal to one for firms with a two-tier agreement in place; in columns 3 and 4 it is a dummy equal to one for firms with a RSA/RSU (union representation) in place; in columns 5 and 6 it is the ratio between union members over total employees. Controls at the bottom of the table refer to regressions in panels A, B and C. All regressions control for number of employees, number of employees squared sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the employee by education, gender, contractual arrangements, occupation and citizenship. Standard errors clustered at municipality levels in parentheses. P-values in squared parentheses for IV regressions.

Table 5: Pooled OLS and IV with Propensity Score

dep. var.	[1] two-tier bargaining	[2]	[3] union (work councils)	[4]	[5] union density	[6]
	OLS	IV	OLS	IV	OLS	IV
free commune	0.051***	0.098**	0.104***	0.125***	0.066***	0.066***
	(0.025)	(0.038)	(0.031)	(0.047)	(0.023)	(0.023)
controls						
employment	yes	yes	yes	yes	yes	yes
year, sector, province FEs	yes	yes	yes	yes	yes	yes
municipality controls	yes	yes	yes	yes	yes	yes
firms characteristics	yes	yes	yes	yes	yes	yes
workforce characteristics	yes	yes	yes	yes	yes	yes
Obs	3939	3939	3803	3803	3893	3893
	first stage statistics for IV					
excluded instrument						
bishop		0.747***		0.799***		0.799***
P-value		[0.000]		[0.000]		[0.000]
Weak identification F		51.52		53.90		60.17
P-value		[0.000]		[0.000]		[0.000]

Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: in columns 1 and 2 it is a dummy equal to one for firms with a two-tier agreement in place; in columns 3 and 4 it is a dummy equal to one for firms with a RSA/RSU (union representation) in place; in columns 5 and 6 it is the ratio between union members over total employees. Estimation method is OLS with propensity score matching in columns 1, 3 and 5; IV with propensity score matching in columns 2, 4 and 6. Controls at the bottom of the table refer to regressions in panels A, B and C. All regressions control for number of employees, number of employees squared sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the employee by education, gender, contractual arrangements, occupation and citizenship. Standard errors clustered at municipality levels in parentheses. P-values in squared parentheses for IV regressions.

Figure 1: Free communes in the Middle Ages



Note. Data at municipality level are from Guiso et al. (2016). We define as free-commune those that were independent in 1176. See the original paper for details.

A Online Appendix: Literature Review

The gist of our paper is that past institutions (the free communes in Italy between the end of the 11th century and the beginning of the 12th), even by means of the development of other formal and informal organizations, gave rise to a cultural change whose effects in terms of labor market relations are still visible today. Under this light, the present work situates itself within the vast and varied literature that investigates the interdependence of institutions and culture and their impact on economic outcomes.[24] Accounting for all the works that deal with these topics is beyond the scope of our work, so in this Section we discuss the papers that are more closely related to ours in its most relevant aspects: the historical period under analysis, the importance of past local institutions, the labor market variables subject of our study.[25]

As concerns the first two features, the work of Guiso et al. (2016) is the one most closely connected to ours. They argue that the emergence of free cities in Italy allowed the formation of a set of civic and cooperative values whose effects are still visible today: the percentage of blood donations and nonprofit organizations, as well the frequency of not cheating at a national exam, is higher in cities that experienced that period of independence in late Middle Ages. Their work validates the conjecture first advanced by Putnam (1993), who had claimed the poor quality of local and regional institutions in some parts of Italy at the end of the 20th century is the consequence of a shortage of trust, cooperation, and participation (all traits that are at the basis of the so-called "civic capital". In turn, such regional discrepancies are a function of whether the given area had experienced a period of independence almost one thousand years before.

Other papers have also focused on the importance of past local institutions within the same country. Tabellini (2010) shows that regions with higher illiteracy rates and worse political institutions (between the 1650 and the end of the 19th century) tend to show specific cultural traits (less confidence and trust) that in turn negatively affect output per capita. Di Liberto and Sideri (2015) assess how the quality of local public institutions affects economic performance in Italy. The endogeneity problem is addressed by using as instrumental variables the different types of foreign dominations that ruled Italian regions between 1560 and 1659.[26]

By studying the connection between present industrial relation and past institutions our work is close to Aghion et al. (2011). They show current beliefs about the quality of industrial relations (measured by surveys conducted on workers and executives) depend on the attitude of past governments towards organized labor.[27] Data on these historical attitudes are taken from Crouch (1993) that documents the different approaches followed by the European states to deal with the emerging labor organizations. Crouch claims that the quality of labor rela-

[24] There is not a unique definition for the term culture. For Guiso et al. (2006) culture is that set of "customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation". Sometimes culture and informal institutions are terms used interchangeably.

[25] Alesina and Giuliano (2015) provide a thorough survey on this literature.

[26] Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2013) also gauge the role of precolonial local institutions on the performance of modern African countries.

[27] The negative relationship between civicness and regulations is also studied in Aghion et al. (2010). In their model, individuals expecting to live in an uncivic society will demand for regulation, that in turn stifles the formation of trust, whereas the opposite occurs if individuals expect to live in a civic community.

tions today depends on the attitudes showed by the states over the 19th century: countries in which governments avoided a direct intervention and favored a cooperative approach between social partners exhibit better labor relations today.[28]

The inquiry on the cross-country differences in labor market regulation is also at the basis of Alesina et al. (2015). Their focus is on the role played by family ties. They find a negative relationship between the structure of the family dating back at least to the Middle Ages and the extent of the regulation in the labor markets. In countries where family ties are strong, workers are less willing to search for a job far away from their home. To avoid firms exploiting such immobility in terms of higher rents, people in these countries will demand for a tighter regulation in the labor market. In their model such a mechanism is self-reinforcing, as in turn it will be optimal to choose a higher degree of family ties when the labor market is heavily regulated.

Central to the main thesis of our work is the concept of long-term persistence. A recent and detailed survey of Voth (2021) exposes the conceptual challenges of the growing body of persistence papers must deal with. He stresses the importance to disentangle the role of cultural and institutional variables from the geographical ones, as well as the limits of resorting to culture as transmission mechanism across centuries without providing detailed evidence on that.

The present paper is also linked to the literature on the persistence of union membership and its transmission across generations. Empirical works on this subject can be divided in two main groups. One branch has focused on the link between union joining behaviour and the family background. For instance, Blanden and Machin (2003) have shown that in UK the likelihood to join a trade union is higher in children of unionized fathers. In the same vein Bryson and Davies (2019) obtain that such intergenerational link is stronger for daughters and when both parents are unionized.

The second group of empirical works studies the geographical variation of union membership. It is now a well-established result that the unionization rate in a determined area is positively influenced by the presence in the past of industries characterized by high levels of organized labor. Holmes (2006) shows the positive relationship between union membership in care homes and grocery stores in West Virginia and Pennsylvania and the unionization of the old coal and steel sectors in the same places. In some parts of the UK (Wales, Scotland, Northern England) such persistence remains despite the substantial structural changes occurred in the 80s (see among the others Beynon et al. (2021)).

A theoretical rationale for these findings may rest on the idea that union membership is an experience good (Holmes, 2006; Bryson and Gomez, 2005), that may be properly evaluated via direct or close associates experience. Moreover, experience goods are chosen by paying less importance to the traditional advertising channels and following more the suggestions of friends and relatives. Another explanation is offered by Booth (1985), that emphasizes the role of social custom: being part of a union in areas where they are viewed favorably increases your reputation, whereas a negative stigma may arise in regions where organized labor is unpopular.

What is important to stress here is that both the experience good framework and the social

[28] The analysis of Crouch (1993) is also used by Müller and Philippon (2011) to examine the relationship between family ownership and the quality of labor relations. Their conclusion is that the share of family firms is larger in countries where labor relations are hostile.

custom one offer an explanation for the path dependence of union membership observed in the data. Such spillover effects (intergenerational or among peers) highlight the crucial role played by "regional and local variations in the inherited and socialized traditions, customs and cultures". In this sense, the present work belongs to the same area of research, with the notable difference that our paper, by looking at the very long-term origins of industrial relations, cannot offer insights at the same level of precision (i.e. within the family) of this body of research.

The paper is also related to the small literature on the emergence and the effects of two-tier bargaining structures on different firm outcomes. Boeri (2014) discusses the emergence of two-tier bargaining across countries, arguing that their adoption is mostly related to three different factors: product market competition, decentralization of production and extension of the terms of bargaining, and (at least in the euro area), the introduction of the common currency. Using the ECB Wage Dynamics Network (WDN) Survey for a sample of EU countries, he also shows that firms that adopt such structures are larger than those who do not engage in two-tier bargaining, are mostly concentrated in manufacturing (with some role also in non-traded services and financial sectors) and that are more likely in firm in which union presence and coverage is high, suggesting that the adoption of two-tier structures is positively related to the presence of unions, and thus it is linked to the emergence of cooperative labor relations. However, Boeri (2014) clearly suggests, an important limitation of this strand of analysis is the non-random adoption of two-tier structures across firms. Endogenous sorting of firms into different bargaining regimes impedes the identification of causal links between two-tier bargaining and outcomes (in particular, adjustments to shocks).

Similar identification problems are present in Cardullo et al. (2020). Using a representative sample of Italian firms, they report a positive correlation between two-tier bargaining and investment in physical (and intangible) capital. Devicienti et al. (2017) partly overcome the above endogeneity issues by estimating in the first stage the probability of adopting a two-tier scheme using propensity score methods. They also find that firms with two-tier structures increase their technical efficiency. Finally, Pompei et al. (2019) study the effects of derogations (opting out clauses) from national collective agreements on employment dynamics. They find that although both hirings and separations increase with respect to firms that do not adopt such schemes, the net employment effect is not statistically different for the two groups. If any, the authors detect differences in the use of temporary contracts for firms opting out from collective agreements.

The paper is also connected to studies that analyze the role of social ties for incentives in the workplace and their relationship with standard monetary incentives to solve agency problems (see Bandiera et al. (2011) for a review). Bandiera et al. (2008) analyze the formation and the emergence of social ties (social capital in their language) among co-workers within a firm. They report a leading role for the following: common nationality, possibility of physical interactions, time of arrival at the firm, and living in the same area.[29] Bandiera et al. (2009) further investigate the role of social connections across different levels of the hierarchical structure, i.e., managers and employees. They show that managerial incentives interact with workers effort through social connections: high powered incentives for managers

[29] In Bandiera et al. (2010), social incentives are shown to affect both individual worker productivity and firm performance in general.

are associated to better incentives for high ability workers, with much less role for social connections. Finally, Fehr and List (2004) use experimental evidence to show that high levels of trust generate trustworthiness, and that the latter explains the initial level of trust. In other words, trust and trustworthiness coevolve, suggesting that reciprocity is crucial element for such interactions.

B Online Appendix: Additional Heterogeneity

In what follows, we further investigate our main results of a positive correlation between the presence of a free-commune in the Middle Ages and our firm level measures of cooperative industrial relations today. As a matter of fact, two-tier bargaining, work councils and unions are more likely to be observed in large firms and in particular sectors.

As Boeri (2014) notes, two-tier bargaining covers about 50% of firms with more than 200 employees in Europe, while such percentage is about 20% for firms below 50 employees. Union presence may be also correlated to firm size, especially in some industries where unions are stronger, as for example in large manufacturing establishments. To further investigate this issue, in Table B1 we report results for our fully saturated models including the entire set of controls and fixed effects as reported in column 3 of Table 3 in the paper and splitting the sample according to firm size (above and below 50 employees). Interestingly, we find that the positive effect of being located in a municipality that used to be a free medieval commune on cooperative labor relations is positive in both cases with coefficients that are of similar magnitude, but turns out to be statistically significant only in the case of smaller firms. This may suggest that long run determinants of cooperative labor relations are relatively more relevant in firms where interpersonal interaction is more frequent and employees are more likely to be closer in every day operations.

In what follows, we explore another important aspect related to the emergence of cooperative industrial relations. Economic theory suggests that the emergence of cooperative solutions is more likely to emerge in an environment in which the parties have already experienced past cooperation and in which reciprocal trust has emerged as an equilibrium outcome. We argue this is more likely to happen if ceteris paribus - firms (and unions) have been operating for a longer time and had the possibility of cooperating. In Table B2, we shed some light on this issue by splitting the sample according to firms age, where we arbitrarily choose the cutoff of 10 years of firms age. We expect that in younger firms it will take time to build this type of relationships and thus long run effects may matter less, even if the social environment is potentially favorable in this respect. Results, that should be taken with particular care, given the small sample size for very young firms, confirm our expectations: the positive effect of past free-commune experience seems to emerge only for firms that are well established in the economic environment.[30]

Finally, we split our sample in two subsamples depending on the macro sector of activity of firms. We do this for different reasons. On the one hand, there is a large literature that

[30] In Tables not reported, but available from the authors upon request, we also experiment using different cut-off for firms age. We choose 5 years, and results are confirmed, although the sample size for young firms turns out to be highly reduced, amounting to less that 500 firms.

shows that union presence and density vary across sectors for reasons related to the elasticity of labor demand and rent availability. Traditionally, unions were stronger and more present in industrial manufacturing sectors with a somewhat less relevant role in the service sector, although we observe a clear decline over time. Similarly, two-tier bargaining varies a lot across and also within sectors (see (Boeri, 2014)), and our sample confirms this variability with two-tier bargaining ranging from 20% in public utilities to less than 3% in hotels and restaurant. Our results, corresponding to the fully saturated model including the entire set of controls and fixed effects in column 3 of Table 3 in the paper, and reported in Table B3, suggest that the size of the estimates is broadly similar for the entire set of our dependent variables, even if our coefficient of interest is precisely estimated only in the case of the service sector.

Table B1: Estimates by firm size

	[1]	[2]	[3]	[4]	[5]	[6]
dep.var.	two-tier	union	density	two-tier	union	density
sample split	below 50 employees			above 50 employees		
free commune	0.031***	0.038**	0.009	0.034	0.031	0.026**
	(0.011)	(0.016)	(0.008)	(0.025)	(0.021)	(0.011)
controls						
employment	yes	yes	yes	yes	yes	yes
year, sector, province	yes	yes	yes	yes	yes	yes
municipality controls	yes	yes	yes	yes	yes	yes
firms characteristics	yes	yes	yes	yes	yes	yes
workforce characteristics	yes	yes	yes	yes	yes	yes
Obs	15731	14818	15602	10152	10134	9850

Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: Columns 1 and 4 is a dummy equal to one for firms with a two-tier agreement in place; Columns 2 and 5 is a dummy equal to one for firms with a RSA/RSU (union representation) in place; Columns 3 and 6 is the ratio between union members over total employees. All regressions controls for number of employees, number of employees squared, sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the employee by education, gender, contractual arrangements, occupation and citizenship. Standard errors clustered at municipality levels in parentheses.

Table B2: Estimates by firm age

	[1]	[2]	[3]	[4]	[5]	[6]
dep.var.	two-tier	union	density	two-tier	union	density
sample split	entry less than 10 years			entry above 10 years		
free commune	0.035	0.030	0.014	0.031**	0.042***	0.016**
	(0.034)	(0.038)	(0.019)	(0.015)	(0.015)	(0.007)
controls						
employment	yes	yes	yes	yes	yes	yes
year, sector, province	yes	yes	yes	yes	yes	yes
municipality controls	yes	yes	yes	yes	yes	yes
firms characteristics	yes	yes	yes	yes	yes	yes
workforce characteristics	yes	yes	yes	yes	yes	yes
Obs	2335	2554	2490	23352	22616	22987

Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: Columns 1 and 4 is a dummy equal to one for firms with a two-tier agreement in place; Columns 2 and 5 is a dummy equal to one for firms with a RSA/RSU (union representation) in place; Columns 3 and 6 is the ratio between union members over total employees. All regressions controls for number of employees, number of employees squared, sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the employee by education, gender, contractual arrangements, occupation and citizenship. Standard errors clustered at municipality levels in parentheses.

Table B3: Estimates by macro-sector

	[1]	[2]	[3]	[4]	[5]	[6]
dep.var.	two-tier	union	density	two-tier	union	density
sample split		industry			services	
free commune	0.025	0.034	0.017	0.040**	0.054***	0.015*
	(0.020)	(0.022)	(0.011)	(0.018)	(0.020)	(0.008)
controls						
employment	yes	yes	yes	yes	yes	yes
year, sector, province	yes	yes	yes	yes	yes	yes
municipality controls	yes	yes	yes	yes	yes	yes
firms characteristics	yes	yes	yes	yes	yes	yes
workforce characteristics	yes	yes	yes	yes	yes	yes
Obs	14983	14497	14707	10902	10457	10747

Note. Our elaborations on RIL 2010-2014-2018 data. Dependent variables: Columns 1 and 4 is a dummy equal to one for firms with a two-tier agreement in place; Columns 2 and 5 is a dummy equal to one for firms with a RSA/RSU (union representation) in place; Columns 3 and 6 is the ratio between union members over total employees. All regressions controls for number of employees, number of employees squared, sectors of activity, province fixed effects and year fixed effects. Municipality controls include altitude, coastal location, near sea, dummies for population in the middle ages, current population, gini inequality index; firm characteristics include dummies for age and gender of the manager, foreign trade, log of sales per employee, multinationals, product innovation, process innovation, foreign trade agreements; workforce characteristics controls for the composition of the employee by education, gender, contractual arrangements, occupation and citizenship. Industry sectors includes: Mining and public utilities; Food and tobacco; Clothing and wood; Textiles, wood, paper; Chemicals and metal products; Machinery and equipment; Other manufacturing; Construction. Service sectors includes: Wholesale and Trade; Transport; Hotels and restaurants; Information and communication; Financial and insurance activities; Other services; Education, health and other private services. Standard errors clustered at municipality levels in parentheses.

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