

Di Liberto, Adriana; Sideri, Marco

Conference Paper

Past dominations, current informal institutions and the Italian regional economic performance

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

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Di Liberto, Adriana; Sideri, Marco (2013) : Past dominations, current informal institutions and the Italian regional economic performance, 53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy", 27-31 August 2013, Palermo, Italy, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/124088>

Standard-Nutzungsbedingungen:

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

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

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

Terms of use:

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

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

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

PAST DOMINATIONS, CURRENT INSTITUTIONS AND THE ITALIAN REGIONAL ECONOMIC PERFORMANCE*

Adriana Di Liberto
University of Cagliari
and
CRENoS

Marco Sideri
University of Cagliari
and
CRENoS

25 January 2013

Sommario

We study the connection between economic performance and the quality of government institutions for the sample of 103 Italian NUTS3 regions, including new measures of institutional quality calculated using data on the provision of four areas of public service: health, educational infrastructures, environment and energy. In order to address likely endogeneity problems, we use the histories of the different foreign dominations and their bureaucracies that ruled Italian regions between the 16th and 17th century and over seven hundred years before the creation of the unified Italian State. Our results suggest a significant role of past historical institutions on the current public administration quality and show that the latter makes a difference to the economic performance of regions. Overall, our analysis confirms that informal institutions matter for development, and that history can be used to find suitable instruments.

Keywords: economic development, quality of government, informal institutions, history, weak instruments.

J.E.L. Classification: O11, O43, C26.

*Contacts: adriana.diliberto@gmail.com, msideri@crenos.unica.it.

The research leading to these results has received funding from the European Union's Seventh Framework Programme FP7-SSH-2010-2.2-1 (2011-2014), under grant agreement n 266834 SEARCH project. We would like to thank Fabiano Schivardi for his suggestions and Davide Fiaschi and Claudio Detotto for providing us with useful data, Pierpaolo Merlin and Giangiacomo Ortu for very useful discussions on historical facts. We also thank Marco Caliendo, Wendy Carlin, Federico Crudu, Luigi Guiso, Lars Persson, Giovanni Sulis and seminar participants at the 2011 ERSA Conference (Barcelona), 11th Journées Louis-André Grard-Varet (Marseille), XVII DEGIT Conference (Milano), SIE Conference (Matera) and at the University of Trieste and Cagliari for their helpful comments and Cristina Murrone and Andrea Schirru for their precious help.

Different patterns of institutions today are deeply rooted in the past because once society gets organized in a particular way, this tends to persist.
Acemoglu and Robinson, 2012, p. 43.

1 Introduction

In this paper we investigate if the quality of the public sector has a significant role in the economic development of the Italian regions. To this aim, we first assess the existence of large differences in the performances of local institutions in providing public goods. Second, we identify in the different realms and foreign dominations that ruled the Italian peninsula in the past centuries a crucial factor which helps explain current institutional performance.

Our analysis is related to the growing literature that dates back to the end of the nineties and investigates how history (and historical institutions) may still influence existing institutions and, through this channel, current economic outcomes. Seminal contributions in this area are those by Engerman and Sokoloff (1997, 2002), Acemoglu et al. (2001, 2002), La Porta et al. (1999, 2008) and, more recently, Acemoglu and Robinson (2012). In this framework, good/bad institutions or, more broadly, social infrastructures, characterized by different levels of efficiency and effectiveness, have a fundamental effect on the observed differences in productivity or per capita GDP.¹

Italian data are most suitable for studying the role that the quality of institutions (broadly defined) have in economic development. First, Italian regions have, with few exceptions, formally identical central Government institutions since 1861. Second, in spite of this apparent institutional homogeneity and unlike most within-country data sets, there exists a deep, persistent duality in the Italian economy between the developed North-Centre and the less developed South. Finally, while the dual character of the Italian economy has been often associated to regional differences in fundamentals such as social² and human capital endowments, a satisfying explanation of the persistence of the regional divide has not yet been put forward.³ Therefore, the Italian regional sample

¹For a survey see Nunn (2009) and see also Hall and Jones (1999).

²In particular, within the large literature on social capital and development, studies on the Italian regions' case dates back to Banfield (1958) (see also Putnam, 1995), and Italian data still represent one of the most commonly used dataset in these empirical analysis.

³On differences in social capital endowments across Italian regions see among the many others the recent papers by Guiso et al. (2008), Tabellini (2010), de Blasio and Nuzzo (2010). On Italian regional dispersion of educational attainments see Di Liberto (2008).

represent a good candidate to examine different functioning and effectiveness of local institutions in a developed economy.

In defining and testing an explanation based on the role of institutions in economic development, we face two main problems. The first concerns the measurement of institutional quality, the second endogeneity⁴. To deal with the first problem, a well-known difficult empirical issue, we calculate an index of institutional quality via composite indicators of local public sector performance, defined as the outcome of public policies. We identify the Italian NUTS3 regions or provinces as the ideal level of geographical disaggregation for an analysis of the role of local institutions. In fact, the provision of public services planned by Italian provinces is, at least for the most part, very limited in scope and should not involve complex policy decision processes. In particular, provinces are directly involved in four main areas of public service: environment, health, energy policy and educational infrastructure. *A priori*, given the strong influence exerted by the central government upon the provision of these public goods at the provincial level, we should expect highly homogeneous outcomes across different areas. As we shall see shortly, this is not the case and we therefore use this as a quality of the overall Italian public sector proxy. In fact, we observe that the same formal institution seems to function very differently in different environments, suggesting that some location-specific informal factor plays an important role.

Besides, the use of NUTS3 regions help us to deal with our second concern, the endogeneity problem between economic outcomes and institutional quality, since enable us to better identify our chosen instruments at a fine geographical level and take advantage of the local/area variability. More precisely, our identification strategy relies on instrumental variables and exploits the Italian past history to build different sets of instruments⁵. Indeed, unlike most European countries, Italian history has been characterized by high levels of political fragmentation that gave origin to administrations of different kind. Since the Middle Ages the Italian peninsula has been also subjected to different waves of colonisations and the numerous dominators that governed over centuries had very

⁴While within-country studies are also likely to be plagued by parameter heterogeneity problems that may affect empirical investigations on this topic. As stressed by Eicher and Leukert (2009) empirical cross-country analyses that use both developed and developing countries show parameter heterogeneity problems since it is unclear whether the identified institutions also hold explanatory power in advanced countries and whether they matter to the same degree across all countries or, conversely, a different set of institutions matters in advanced vs. developing countries.

⁵On this see Acemoglu et al. (2001), Rodrick et al. (2004), Pande and Udry (2005), Guiso et al. (2008), Tabellini (2008), Bosker and Garretsen (2009) among the others.

different cultural and political features and implemented highly heterogeneous formal institutions in the administrated territories. The two extremes cases are identified by the State of the Church, that was an example of corrupt institutions and administrative inability, and Austria that is usually portrayed as a good administrator that did not implement exploiting or extracting policies.⁶

Thus, we focus on the different dominations as the critical historical events that matter for current institutional settings but do not plausibly influence current economic performance. In fact, in this study the current functioning of similar formal institutions at the local level are thought to be, at least in part, the result of the previous existence of highly heterogeneous formal institutions created by historical accidents across the Italian regions. In this respect, our study is related to the recent literature that explores the role in economic outcomes of informal institutions, where the informal element affecting the functioning of similar formal institutions is thought to reflect local differences in social capital, and that in our context is more easily associated with specific features such as managerial practices, culture or citizens behavior (for example, Guiso et al., 2008, and Tabellini, 2010).

It is also related with the specific literature developed by legal scholars on *transplant institutions* that focus on the importance of legal institutions and cultural transmission. In other words, these studies stress as societies are governed by both formal and informal norms and institutions and assume that the informal legal order may slowly evolve over time significantly affecting the effectiveness of formal institutions thus departing from other research that implicitly assume that ...the quality of law on the books ensures the laws will actually be enforced.⁷ With respect to the Italian case a similar process is well documented by historians. In fact, the way in which the unification process has been implemented in Italy after 1861 implied a long lasting influence of the old institutions, in particular within public sector activities: ...the map of the institutions in the territory had to take into account the many existing particularities, giving rise to a reality more varied and uneven than suggested by rules and the same formal structures ... The result was an administrative practice in many cases ambiguous ... affected by the crucial influence of local

⁶For details on this see Appendix B1.

⁷See in particular Berkowitz et al. (2003). On this see also Roland and Verdier (2003) and Banerjee and Iyer (2005). In this latter study, they focus on agricultural productivity differences across districts in India and test for the possibility of institutional overhang, a concept similar to transplant institutions.....

contexts.⁸

In terms of the empirical strategy, the wide variability among dominators permits the creation of instruments able to capture exogenous variation in regional Italian institutional quality. More precisely, in this study we identify two different candidates and therefore build two different sets of instruments. Our first instruments set uses a series of dummy variables that identify, for each province, the administration that occurred during the period of the Spanish domination in Italy, 1560-1659. This choice is based on two main reasons. First, during this period the Italian peninsula was ruled by different formal governments and each dominance has lasted for a sufficiently long period. Indeed, each province experienced the same formal government for the whole period. Second, Spain has been often portrayed by historians as having negatively affected the dominated areas also through its legacy of inefficient bureaucracy.

Our second approach follows a different path with respect to previous studies which are typically based on specific historical events. Instead, here we build a matrix indicating, for each province, the kind and the duration (in years) of domination that ruled during the period between 12th and 18th century. To this aim we collect data for all different regimes that governed each Italian province over seven centuries before the creation of the unified Italian State.

Overall, results confirm our expectations. Considering our first stage results, we find that if a province has been dominated by the Papal State, the Spanish rule and the Normans it has had a negative impact on institutional quality, while results on the other dominations are less clear-cut. Finally, second stage results suggest that the impact of improving the public sector performance of Caserta (the province showing the lowest indicator) to the level of Gorizia (the highest) is significant and equivalent to a 30% decrease in the gap between productivity levels measured as added value per worker. These results are robust to the inclusion of different additional controls such as human capital, geography, crime and different social capital and cultural proxies. In particular, our human capital indicator always shows a positive and significant coefficient.

Moreover, our analysis seems to confirm previous evidence that dispute the role of social capital

⁸All'atto pratico la mappa delle istituzioni sul territorio dovette tenere conto dei molti particolarismi esistenti, dando luogo a una realtà di fatto più varia e difforme di quanto non suggerissero le norme e gli stessi assetti formali. . . Ne derivò una prassi amministrativa in molti casi ambigua . . . condizionata dall'influsso determinante dei contesti locali. Melis G. (1996), p. 78.

measured by widely used indicators that capture the role of generalized morality and interest in politics, and find that its effect is significantly weakened when a measure of the quality of government institutions is introduced in the analysis⁹. Finally, we find that the public administration performance seems to influence more effectively productivity in the most innovative sector, the industrial sector, rather than in agriculture or services.

The structure of this study is based on six different sections. The following section introduces the descriptive analysis, while the third section shows the preliminary OLS results. The empirical strategy and related IV results are described in the fourth section, while the fifth contains our robustness checks. Conclusions are in section six.

2 Data and measures of institutional quality

In our empirical analysis, we need to measure the quality of institutions, a variable that cannot directly be observed. In fact, the measurement of public sector performance is a well-known difficult empirical issue and here we follow an approach that calculates the quality of public expenditure defined as the outcome of public policies¹⁰. These data are provided by the National institute of statistics and, since they are not collected on a regular basis, they relate to years ranging from 1996 to 2002.

We identify the Italian 103 NUTS3 regions or provinces as the ideal level of geographical disaggregation for our analysis. Reasons are twofold. First, even if provinces have a limited importance in the Italian administrative structure, they are directly involved in the provision of four important areas of public service¹¹:

1. Environmental protection;

⁹See Tabellini (2010).

¹⁰See Afonso et al. (2005). They distinguished between measures of public sector performance, defined as the outcome of public policies, from public sector efficiency, defined as the outcome in relation to the resources employed. Due to data constraint on costs of public services we follow the first approach and identify as a proxy of the quality of institutions different measures of the level of efficiency characterizing certain public services provided by the local governments.

¹¹As specifically indicated by the Italian legislation (art. 19 Testo Unico 267/2000 on the local administrations). The number and territorial definition of Italian provinces have changed during time but, due to data availability, we follow the administrative structure in force until 2005. NUTS3 regions include between 150 to 800 thousand inhabitants. As an example, the nominal counterpart to a NUTS3 region in a few large countries is County in US, Departements in France and Landkreise in Germany.

2. Energy policy;
3. Health system quality:
4. Educational infrastructure.

Second, unlike the regional NUTS2 level of administration, the provision of public services provided by provinces is, at least for the most part, limited in scope and should not involve complex policy decision processes. Thus, we should expect highly homogeneous efficiency levels across the different areas¹². As we shall see, this is not the case: we observe that the same institutions function very differently in different environments, suggesting that informal institutions play an important role.¹³ That is, we depart to a certain extent from the vast cross-country literature that examines the role of different formal institutions on economic development.

Note that the definitions of formal and informal institutions are the subject of much debate. In particular, the term informal institution encompasses a wide range of concepts; the most intuitive definition of informal institutions is possibly that of 'socially shared unwritten rules' in contrast with the written rules or formal institutions¹⁴. Detailed analysis of this issue goes beyond the scope of this research but, as also in Tabellini (2010), we stress that in terms of empirical analysis if informal institutions are important for development we should observe, as we do in our study, different functioning and effectiveness of the same formal institutions.

To create our quality of institutions indicator we focus on 12 different output indicators that relate on our four areas of public service provision and we estimate their first principal component

¹²This is not the case at NUTS2 level of disaggregation, since Italian regions have different formal institutional settings (regioni a statuto speciale vs. regioni a statuto ordinario).

¹³A similar approach can be found in Giordano and Tommasino (2011) who calculate different measures of public sector efficiency at Italian provincial level. However, unlike our indicators, their public sector output measures do not satisfy certain characteristics that are important in this setting. First of all, their public sector output measures are provided at different levels of government (Central, regional and provincial). Secondly, they rely on a single and, most of the time, very specific public sector output measures. Finally, they use the DEA approach that is data demanding since it involves the use of public sector input measures as well as output to calculate efficiency. Given the lack of data they need to rely on strong assumptions. We claim that our measures control for most of these potential bias.

¹⁴We employ a fourth approach. We define informal institutions as socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels. By contrast, formal institutions are rules and procedures that are created, communicated, and enforced through channels widely accepted as official. Helmke and Levitsky (2004), p.727. See also Glaeser and Shleifer (2002).

score. Details on these indicators are in Appendix A1.¹⁵ The use of a synthetic index offers different advantages. First of all, it considers important and heterogeneous areas of public service provisions and, for this reasons, it is more likely to affect the overall economic regional performance. Secondly, it is less likely to be influenced by specific local factors not necessarily related to the efficiency with which the public service is offered.¹⁶

Figures 1 and 2 focus on the territorial distribution of our key public sector performance indicator. Figure 2 suggests the presence of a small group of provinces showing higher levels of public sector efficiency than the remaining provinces, while Figure 1 enables us to geographically identify these areas. Not surprisingly, the Italian peninsula map in Figure 1 tells us that less efficient areas are mostly located in the South, while the highly efficient club is mainly formed by provinces located in the North and Centre of the country. Our best performing province is Gorizia (North), while the area with the lowest value of institutional quality is Caserta (South).

We now turn to the analysis of our set of dependent variables. Our main productivity measure is total value added per worker that represents a standard proxy of an area economic performance, but we also use value added of specific sectors, that is, agriculture, industry and services to check if our measure of institutional efficiency differently affects these sectoral performance indicators. These variables are calculated as average value 2002-05. Table 1 introduces some descriptive statistics and shows, not surprisingly, that our various productivity measures are not evenly spread across sectors. In particular, the productivity of the industrial sector has a higher standard deviation value while, as expected, we find the lowest dispersion in the service sector that include both public and private services.

In Figure 3 we investigate how total value added, our main productivity measure, is distributed across Italian provinces: the darker the color in the map, the higher the productivity levels. This map clearly shows the expected significant differences between the Northern provinces and those of Centre and South of Italy. The only exception is given by the province of Rome that exhibits high levels of productivity, a result that is influenced by the presence of the capital city. Areas

¹⁵In a previous draft of this work we have used different indices of institutional quality, an overall index and 4 indices for each area obtaining similar results. The correlation between the old overall and the new index is 0.91. See Di Liberto and Sideri (2011)

¹⁶For example, observed regional differences in the provision of Energy services may be influenced by geography while Educational infrastructures and/or the Health indicators by specific local demographic characteristics.

characterized by high levels of productivity are the Piedmont and the Lombardy, with Milan as leader. Similar characteristics have been also observed when we disaggregate our productivity measure by sectors.

Finally, Figure 4 identifies a clear positive correlation between productivity, measured as per worker total value added, and our main measure of institutional quality and shows that, with few exceptions, low levels of efficiency in all areas of public service provision are geographically located in the southern part of the country (the latter identified by red dots, and the remaining provinces by black triangles).

Next, we continue our descriptive analysis in Table 2 with the remaining additional controls. As said above, a different value of our quality of institution measures across regions may be the result of low education, bad managerial practices, social norms that encourage shirking, low trust or, more broadly, low social capital. First, we introduce two geographical controls based on the latitude (standardized in a range between 1 and 0) and on the average temperature recorded between the period 2000-2009; for this variable we have Trapani (South) as the hottest province and Aosta (North) as the coldest. In this way, we are controlling for factors only related to the location and the geographical features of the province. These variables should thus capture residual and other unobservable geographic or cultural factors that may have independently affected provincial economic performance. Second, we consider the rate of extortions, that indicates a proxy of the presence of organized crime groups and, as a consequence, the presence of obstacles for the economic initiative; this element is quite important both from the social and the economic point of view ¹⁷. The variable indicating the rate of extortions over 1,000 inhabitants indicates that Treviso is the province with the lowest extortion rate in the country while Catania is the poorest performer; the value of the standard deviation suggests a quite high variability across provinces.

We also include a standard measure of social capital as an additional control. The role of social capital in economics is a highly debated issue and this is also certainly due to its vague and excessively broad definition¹⁸ In fact, one of its possible dimensions is measured by our main

¹⁷"In (IIWW) postwar Italy norms of corruption were more powerful than the law of the state: the latter could be violated with impunity, while anyone who challenged the conventions of the illicit market would meet certain punishment" Helmke and Levitsky (2004), p. 726

¹⁸See Guiso et al. (2011). On this see also Knack (2002).

regressor, that is, the quality of governing institutions and the concept of informal institutions and social capital are often used interchangeably.

Implications are twofold. First, our efficiency indicators could also capture the effect of alternative social capital dimensions and therefore we need to control for them. For example, social capital may promote institutional effectiveness through its effects on the behavior of bureaucratic elites. It does so through many possible channels since it fosters the ability of bureaucrats to co-operate and work together more efficiently. Second, public administrations involve complex institutional arrangements and these organizations are beset by the classic principal/agent problem where senior managers (principals) are responsible for overseeing the work of a very large number of lower-rank administrative personnel (agents). Social capital affects the amount of time and resources principals must devote to monitoring, and with high social capital the organization they control will be more efficient and productive, as the expectations that agents have about the behavior of their colleagues and supervisors are different.¹⁹

Second, the choice of an additional social capital indicator is not straightforward since one of the main concerns in this empirical literature is also how to measure it. In this paper we use a synthetic social capital index at regional NUTS3 level, provided by Cartocci (2007), which merges data on 1) blood donations, 2) sport participation, 3) dissemination of newspaper and 4) voter turnout. The main advantage of this indicator is that it covers different aspects of social capital. In particular, blood donations data are used to assess the role of generalized morality, sport participation is assumed to influence social capital since it supports the building of groups of mutual interest and promotes pro-social while diminishing anti-social behavior and, lastly, both newspaper dissemination and voter turnout should capture people's interest in politics. Table 3 shows a well-known result: synthetic descriptive statistics on our social capital indicator suggests that Italian regions are, as expected, highly heterogeneously endowed. Again, Vibo Valentia and most southern provinces show the lowest values, while, North-Centre provinces (in particular Bologna and Parma are top of the league) have the highest.

Another control considered in our analysis is the rate of religious weddings on total weddings;

¹⁹As a result, the provision of collective goods will be slower and more expensive than in more civic polities. See Boix and Posner (1998), p. 692. On this see also Ichino and Maggi (2000) who show that prevalence of shirking within large Italian banks can be explained by the effect of peer pressure.

this element may capture cultural differences but, as in Putnam’s [1993] view, it can also be linked with trust and social capital. In particular, Putnam classifies hierarchical religions and, thus, also Catholicism as being detrimental for horizontal ties and trust.²⁰ Note that also in this case we observe significant differences across regions, mainly between northern and southern areas of the country,²¹ with Vibo Valentia (South) having almost all church weddings, 94%, and Trieste (North) with only 57%.

Finally, among the most important controls in this type of analysis we identify human capital. Recent evidence stresses as the two things, institutional quality and human capital, may be closely interrelated: better educated countries almost invariably have better governments.²² Indeed, excluding human capital from the analysis would therefore significantly bias our results on the performance of institutions indicator as the latter could also capture its effect on per worker value added.

Secondly, there is a growing literature that, while stressing the role of educational policies and schooling, seems also to dispute the role of cultural or institutional factors on growth and development. For example, using county-level data from late 19th-century Prussia, Becker et al. (2009) find that, after controlling for the positive effect of literacy on economic success, there remains no significant difference in economic outcomes between Protestant and Catholic counties. Their results seem to invalidate the widespread idea, originated from Max Weber’s theories that attributed the higher economic prosperity of Protestant regions to a Protestant work ethic.²³ Thirdly, unlike most industrialized countries, Italian regions show a high heterogeneity in terms of their human capital endowments, which are considered by a large literature as one of the main determinants of productivity. In general, compulsory schooling was enforced in Italy quite late in the 19th century.

Using 2001 census data on educational attainment, in our regression analysis we firstly calculate the average years of schooling of the population for each province.²⁴ Details are in Appendix A1.

²⁰On this see also Knack and Keefer (1997) and La Porta et al. (1997).

²¹The Italian National Institute of Statistics has just released data indicating that the number of civil marriages has just passed (50.1 percent) in the north for the first time in 2011 that of religious marriages. In southern areas religious marriages are still 76 percent of total marriages.

²²Botero et al. (2012) show as this empirical regularity holds in both dictatorships and democracies.

²³On this see also Botticini and Eckstein (2011). They identify in a shift in Jewish religious leadership that required every Jewish man to read and to study the Torah in Hebrew and to send his sons from the age of six or seven to primary school the cause of the following development of institutions that fostered contract enforcement.

²⁴Note that we include all regressors measured at some $t-\tau$ time span with respect to our dependent variables that,

Indeed, this is a standard measure of the total stock of human capital of an area and represents a better control for human capital than enrolment rates or alternative indicators. With approximately 8 years of education, Caltanissetta and Agrigento (both in Sicily) are the provinces with the lowest educational endowments, while the highest levels are found in Rome, 10.1 years followed by Trieste, 9.9 years.

As expected, Table 3 indicates that all these factors are highly correlated.

3 OLS results

We set the scene with ordinary least squares estimates in order to check the relations between informal institutions and economic outcomes using the following specification: our productivity variable of the 103 Italian provinces on our measure of the performance of the public administration, plus a set of control variables:

$$Y_i = \alpha + \beta QUAL_INST_i + X_i' \gamma + \epsilon_i \quad (3.1)$$

In equation (1) Y_i is the outcome variable for province i , $QUAL_INST_i$ represents our measure of the performance of the public administration and X is a vector of plausible alternative important determinants such as geography, social capital and other cultural factors. Our main coefficient of interest is β that we expect to be positive and significant, thus confirming a positive correlation between productivity our informal institutions variable. In Table 4, models (1) to (8), we include the results obtained by the most parsimonious specification that introduces our measure of $QUAL_INST_i$ as the only regressor and then provide alternative specifications where we add our additional controls, human capital, latitude, temperature, extortions, social capital and religious weddings.

In model 1, our parsimonious specification shows that our quality of institutions variable has a positive and significant coefficient. In model 2 we further introduce human capital (measured as average years of education) and both coefficients are, as expected, significant and positive. Model 3 includes also geography, that is, temperature and latitude: both these additional controls

as said above, are all measured as average 2002-05. Even if this does not completely solve the problem, this choice enables to better control for likely endogeneity arising from reverse causality. On this see also section 4.

are not significant and, most important, make our main coefficient on institutional quality not significant. When we further introduce extortions (model 4) nothing changes significantly, while models including our two social capital controls (models 5 to 7) show as the latter are never significant. Finally, we include all the controls jointly. Overall, our indicator of institutional quality is not significant in models (3), (4) and (8) where geography is included, while extortions and human capital are the only controls always showing a significant coefficient. This puzzling finding could also be due to endogeneity that it is likely to plague all OLS results. In the following sections we therefore describe how we deal with this issue.

4 Does history matter? Empirical strategy and IV estimates

As said above, in this framework the main difficulty is to assume that the impact on economic performance runs through institutional settings and not *vice versa*. Quoting Acemoglu et al. (2001) "At some level it is obvious that institutions matter... Nevertheless, we lack reliable estimates of the effect of institutions on economic performance. It is quite likely that rich economies choose or can afford better institutions."²⁵ Needless to say, endogeneity is also likely to arise since measured quality of institution proxies may capture the effect of other factors omitted from the regression analysis or from measurement error. Both of these econometric problems are likely to affect estimates in this setting. In our study we use a two-stage least square approach to deal with likely endogeneity issues. In particular:

$$\text{First stage: } QUAL_INST_i = \delta + \theta HIST_i + X_i' \gamma + v_i \quad (4.1)$$

$$\text{Second stage: } Y_i = \alpha + \beta QUAL_INST_i + X_i' \gamma + \epsilon_i \quad (4.2)$$

where, HIST refers to some historical events/variable that may plausibly be assumed to have influenced current institutional quality and that affects current productivity through that, while X includes the usual additional covariates.

Indeed, in macro empirical analysis history matters since it enables researchers to find good instruments and to get through one of the main difficulty they have to face in these cases.²⁶ Having

²⁵Acemoglu *et al.* (2001), p. 1369.

²⁶On this see also Angrist and Piescke (2010).

said that, how to specifically construct the instruments set is not a straightforward choice since we need to identify plausible critical historical facts that do not directly affect today's output but have led to divergent political and economic development paths across Italian regions through their persistent influence on current efficiency of governing institutions.

In our search for good instruments we rely on Italian history and its wide variability among dominators. In particular, since the end of the Roman Empire pre-unitary Italy has suffered over many centuries of different dominations, and we use the latter in order to identify two plausible instruments sets. Overall, it is fair to say that we cannot assume that different dominations were fully random: they were in fact the result of a series of historical processes. However, we claim that our instruments choice is plausible and robust to most possible problems. First of all, historical data show as economic differences across regions in pre-unitary and pre-industrial Italy did not accurately resemble current regional differences. In particular, the few data available reveal many northern and centre regions lagging behind southern ones in terms of per capita productivity in agriculture.²⁷

Moreover, we focus on historical facts that took place in the distant past, when the Italian peninsula was seen (at least for its most part) by foreign realms as a conquered land. Therefore, most processes have been determined mainly by external factors and we can state that these processes were independent from the actual level of regional economic growth. An example is offered by the location of the Papal State. This was determined during the Roman Empire when the Pope chose to establish his base in Rome and, from then on, irrespective of the continuous political, social and economic turmoil and changes that took place over the centuries, has maintained his influence in this area of the country. The defeat of the Spanish Armada in 1588 against the English fleet is another example. This had an enduring influence on the Spanish power and, therefore, also on its Italian territories. As stressed by Acemoglu and Robinson (2012) accidental events such as bad weather and strategic mistakes by the Duke of Medina Sidonia, who has been put in charge of the Spanish Armada at the last minute due to the sudden death of a more experienced commander,

²⁷ "...in 1861 (Italy) was a poor and densely populated country, with standards of living very close to subsistence, in both North and South." Daniele e Malanima ??? This study also shows that, unlike productivity and GDP, in terms of culture and social indicators the North-South pre-unitary divide was significant. See also Ciccarelli et al. (2010).

played a large role in the Spanish defeat.²⁸

Finally, in this study we also explore the reasons why historical institutions may still affect the performance of current institutions. More precisely, we offer an explanation based on the legacy of informal institutions, that is, old norms and beliefs that have persisted and still affect local PS performances. Historical documents show as the numerous dominations were organized very differently before the Italian unification process and the transplant of the new post-unification formal institutional model did not eliminate the old administrative practices and procedures. Reasons for this are threefold. First, the Public sector employees prior to unification were kept in place and became the bureaucrats of the newborn state and, in most cases, they were hostile to changes. Second, since the beginning of the unitary experience, the selection and training of bureaucrats has been governed by the administration itself, with serious consequences of social isolation of the bureaucracy, with the career ladder mainly determined by seniority rather than merit. But the main reason is identified in the *weak centralisation* model followed by the newborn Italian state. As fully described in Appendix B2, the post-unitary Governments were not effective in monitoring and enforcing the new rules in the different territories. As a result, significant differences in administrative practices and procedures within the country persisted, and still affect territorial public provision processes.²⁹

4.1 First approach: dummy variables

In this section we describe the first approach that takes a picture of the Italian political situation in which different areas were ruled by different Governments for a significantly long time. That is, for each province, we identify the administration that ruled during a specific period of time and create a series of dummies, each representing a different domination, whose influence is assumed to have persisted over time.³⁰ In this case, in order to avoid arbitrary choices, the specific historical period should be selected following certain criteria. These are described below:

²⁸ "...in 1588, the lucky rout of the Spanish Armada, an attempt by King Philip II of Spain to invade England, sent political shockwaves around Europe." Acemoglu and Robinson (2012), p. 19.

²⁹Melis (1998), p. 43.

³⁰For details, see also Table A1, in Appendix.

- It has to be necessarily a period before the Italian Unity (1861). Since then, almost all current provinces had the same political structure and formal institutions.
- We need to focus on a period when the Italian peninsula was dominated/ruled by different formal governments.
- Each dominance must have lasted for a sufficiently long period. Although it is no guarantee, it is at least plausible that the longer the domination the greater its influence.
- Each province must have had the same formal government for the whole period.

A good candidate that meets all these criteria is certainly the historical period during which a large part of the Italian peninsula was dominated by the Spanish rule, namely, the period 1560-1659. During this period, considered as crucial by historians and political scientist in terms of territorial consolidation of most Western Europe states, Italy was very far from starting any state formation process.³¹ Figure 5 (Part A) shows the Italian peninsula after the Cateau-Cambresis peace treaty (1559) that gave to Philip II of Spain the possession of the three kingdoms of Naples, Sicily and Sardinia, the duchy of Milan and the so-called State of Presidi³² in Tuscany.

The Spanish kingdom had a great influence in Italy for a long period of time, mainly during the 16th century and part of the 17th. Not many years after Columbus sailed for the Americas, in Italy the Spanish troops had a direct control over 140,000 square kilometers (almost half) of the Italian peninsula and the Spanish influence was very strong in most of the Italian territory. Still, a significant part of the (northern) Italian peninsula maintained a certain degree of independence, in particular, the Republic of Venice (with all the Veneto and a great part of Lombardy), the Duchy of Savoy (with Piedmont, Nice and Savoy), the Grand-duchy of Tuscany, the Duchy of Parma and Piacenza, the Duchy of Mantua and Monferrato administrated by Gonzaga-Nevers, the Republic of Lucca and the Republic of Genoa.

Moreover, another reason that justifies our choice is that the Spanish hegemony in Italy has been often portrayed by historians as having negatively affected the dominated areas also through

³¹Rokkan consider the period from 1600 to 1800 as crucial for the state formation of Western Europe nations. See Flora et al. (1999)

³²This was a very small area of great strategic and military importance on the Maremma coast in Tuscany created by the will of King Philip II of Spain, and then entrusted with the Neapolitan territories.

its legacy of inefficient institutions and bureaucracy and the implementation of extractive policies in foreign territories.³³ More precisely, early modern Spain has been one of the first state to develop an organized bureaucracy often described by many historians as "...a rent-seeking organization indulged with anachronistic privileges by a revenue-hungry Crown".³⁴ Indeed, especially during these years, Spain had to finance continuous military activities and its bureaucracy is often described as crucial mainly for tax collection.³⁵

Some descriptive analysis offers additional hints. Figure 6 identifies in blue all provinces in which the Spanish power have ruled for more than 150 years. Conversely, red triangles detect the provinces that were ruled for less than 150 years by the Spaniards or not conquered at all. Most provinces ruled by the Spanish for a long time are now characterized by low levels of productivity and low levels of institutional quality. Moreover, with the exception of some area located in the Northern part of the country (Lombardy and Piedmont) most ex-Spanish colonies were located in the south. In order to identify the different administration/domination prevailing in each Italian province, in our first approach we construct a series of six dummies, that is, Spanish, Papal, Austrian, Venetian, Sabaudian and, finally, Independent areas. Figure 5 (Part B) allows to easily identify the geographical location of these dominations.

In Table 5 we show our IV estimator results: for each model, the first column reports the first stage estimates, namely the effect of dominations on current quality of institutions, and the second one reports the second stage estimates. To check the goodness of our IV specifications, we include the p-value of the Sargan test of over-identifying restrictions to check the validity of our instruments and finally test whether our excluded instruments are independent of the error

³³A well documented example is the Mesta, an inefficient institution with imperfectly stipulated property rights, where the Spanish Crown had granted to the shepherds guild (Mesta) the right to drive their sheep across agricultural land. See North and Thomas (1973).

³⁴Drelichman (2008), p. 235, have a an alternative and more positive interpretation of the Spanish bureaucracy. However, his analysis focuses almost exclusively on historical documents and data related to Spain, thus excluding evidence on Spanish colonies. But less conventional historical point of view on the Spanish domination and bureaucracy in Italy can also be found. For example, Croce (1922) maintained that the Spanish misgovernment was more a myth than a real historical fact. Moreover, Croce (1922) supported the idea that Italy would have been able to become independent from Spain as the Netherlands did, but it was too politically divided and weak. It is also said that, despite being administrated by the domination of Madrid, unlike the feudal domination applied in the Mezzogiorno, provinces in the Northern area of the Italian peninsula ruled by Spain enjoyed a relative autonomy. On this see also Sella and Capra (1984).

³⁵During Philip II's reign (1556-1598) during that leads Spain into the final phase of the Italian Wars and ended with the Treaty of Cateau-Cambresis, Spain was at peace for only six months. See Drelichman and Voth (2011).

process.³⁶ Moreover, since the feature that makes our instruments plausibly exogenous, that is, the fact that they occurred in the distant past, may also make our instruments weak we also control for this problem.³⁷

The instrument relevance issue in IV estimates has recently received increased attention by applied researchers, since weak instruments problems imply that the sampling distributions of IV statistics are non-normal and standard IV point estimates, hypothesis tests, and confidence intervals are unreliable. As a rule of thumb, we firstly check if the first-stage F-statistic is larger than ten³⁸. Since we only have one endogenous variable we also conduct inference that is robust to weak instruments using Moreiras (2003) conditional likelihood ratio (CLR) test statistics³⁹. The latter enables us to create confidence intervals robust to weak instruments that we include among results, together with Limited Information Maximum Likelihood (LIML) estimates since they are more robust to weak instruments than standard IV⁴⁰.

Model 1 in Table 5 shows the results of the parsimonious specification. In the first stage we exclude the Independent areas dummy from the analysis and find that the dummies referred to the Spanish domination and the Papal state are significant, both with a negative sign. This implies, as expected, a negative correlation between these past administration and current institutional quality.⁴¹ Most of the remaining historical dummies show the expected sign, but they are not significant. Further, second stage results suggest that the influence of the quality of governing institutions on per worker VA is significant. In particular, the coefficient on institutional quality implies that the difference between the efficiency of the governing institutions in Caserta (the province showing the lowest indicator) and that of Gorizia (the highest) explains up to 31% of the gap in productivity levels. Finally, the over-identification restriction is not rejected, while the first stage F-statistics

³⁶Under the null hypothesis that all instruments are uncorrelated with the error process. We obtain almost identical results using the Basman test.

³⁷Finding exogenous instruments is hard work, and the features that make an instrument plausibly exogenous for example, occurring sufficiently far in the past to satisfy a first order condition or the as-if random coincidence that lies behind a quasi-experiment can also work to make the instrument weak. Stock et al. (2002), p.2.

³⁸In particular, Staiger and Stock (1997) and Stock and Yogo (2005) develop a test for weak instruments that, in its simplest form, rejects the null hypothesis of weak instruments if the first-stage F is bigger than ten.

³⁹Moreira (2009) shows Monte Carlo simulations results where the CLR test for the endogenous variables coefficient has good power overall in over-identified models and dominates the AndersonRubin and score tests. On this, see also Murray (2006).

⁴⁰Reasons are twofold. First of all, the CLR test is centered around the LIML estimator. Secondly, LIML estimates are more robust to weak instruments than standard IV.

⁴¹On the expected role of the different dominations see the Appendix B1.

and the CLR test suggest estimates are free from weak instruments problems.⁴²

In the following models we add our additional controls, that is, human capital, geography, extortions. All these indicators are measured at regional NUTS3 level. In model 2 we firstly introduce a measure of human capital stocks based on average years of education. The coefficient on the quality of institutions decreases but it is still significant, while the human capital indicator is always positive and strongly significant. However, once we introduce the additional controls described in section 2 results change. In particular, model 3 includes our two different controls for geography, respectively, latitude and average temperature, while model 4 introduces extortions. Latitude and temperature are never significant in the second stage while cause our coefficient on the quality of institutions to become non significant. In fact, with the exception of human capital and extortions in some specification, in the second stage all additional indicators are almost invariably non significant. In addition, the first stage F-statistics and the unbounded confidence intervals provided by the Moreira test suggest stress the presence of weak instruments problems. This problem persists even using alternative specifications of the model.⁴³

4.2 Second approach: years matrix

The dummy approach adopted so far may be subject to various criticisms. First of all, this method considers just a picture of the Italian history that, even with reasonable criteria of choice, limits our analysis to a short and specific period. Second, a system based on dummies is implicitly assuming that each different regime had the same importance and impact. Conversely, in principle it is likely that longer domination and regimes could have had a greater impact and left more persistent and lasting effects. Indeed, this could be the case for northern regions ruled by Spain: in this case the Spanish domination has been shorter than in southern areas. Finally, in the dummy approach the *Mezzogiorno* is considered entirely as part of the Spanish domination and this implies that there is almost no variability in that area.

Therefore, unlike previous studies, that usually focused on specific historical events, in choosing our second instrument set we follow a different path and collect data for all different regimes

⁴²Unfortunately, while providing foundation for building confidence intervals, conditional likelihood test does not provide point estimates. For more on this see Murray (2006).

⁴³We have performed the same analysis as reported in Table 7 using the dummy approach. Results are available upon request.

that governed each Italian province over seven centuries before the creation of the unified Italian State. Our historical analysis goes as far as it can in order to capture the main characteristics of past Italian dominations. In particular, we consider the period between 1100 and 1800 where the historical lower bound is determined by the high political instability of the Peninsula since the Holy Roman Empire downfall until the Norman rise (about 1100) and also by the absence of reliable historical documents. The upper bound has been chosen, again, because since 1800 the Napoleonic era had established a situation of dramatic changes and instability in the Italian politics with a series of wars that persisted until the Italian Unity in 1861.⁴⁴ In sum, this approach enables us to overcome different criticisms that characterize the dummy approach. First of all, it inserts some variability in southern areas. Another advantage is that it takes into account all possible different influences that a specific territory has had during a long period of time, seven hundred years, thus introducing a more detailed analysis. Finally, it considers and weights the different levels of persistence that each domination has exerted on territories.

During these 700 years we have identified the following dominations: the Normans, the Swabians, the Anjou, the Spanish (Aragonese until 1502), the Bourbons, the Papal State, the Savoy, the Austrians and the Republic of Venice⁴⁵. Secondly, we have constructed a matrix that assigns to each province the number of years during which each regime has persisted in a specific territory. More historical details can be found in Appendix 3. Note that, as expected, in specific cases we had to rely on some simplifying assumptions. Problems also arise for small states, whose regimes were, in some cases, highly influenced by foreign powers and could thus be considered as ruled by them. Nevertheless, if not formally dominated, we identify these difficult cases as part of the independent states class.

Table 6 offers some descriptive statistics of our new set of instruments. The mean values column suggests a strong persistence of the Papal state and the Spanish domination in their territories. Moreover, we observe that some provinces have not experienced any change in regimes during the whole 700 years: this is true for provinces ruled by the Republic of Venice, the Savoy, the Papal

⁴⁴It can also be said that the French revolution has triggered the Italian Unity: ...the French revolution certainly had immediate as well as long term effects on all national movements, particularly on those leading to the unification of Italy and Germany. Flora et al. (1999) p.37.

⁴⁵I percorsi della Storia - Atlante, De Agostini, 1997

state and it is also the case for some independent territory.

Table 7 replicates the previous Table 5 analysis changing our set of instruments based on history. Considering first stage results (first column in each model) in the most parsimonious specifications (models 1 and 2) we observe a negative and significant coefficient on Normans, Spain and the Papal state dominations.⁴⁶ Thus, our result on Normans seems to confirm previous studies on the Italian case that, following Putnams (1993), usually identify the Norman Kings as having negatively affected social capital levels and, through that, development.⁴⁷ In particular, Putnam identifies the collapse of the Holy Roman Empire and the two political regimes that followed in Italy, the Norman Kings in the southern areas and the independent towns in the North, as the critical historical juncture that have influenced the degree of local civic commitment. In this view, independent towns were characterized by high levels of civicness, unlike southern regions ruled by the Norman autocratic regime, and civic capital is considered not only highly persistent over time, but also a key factor to explain current differences in Italian regional economic performance.

Our analysis offers a more complex picture, where different dominations and historical events seem to matter. In particular, the Spanish domination is, again, negative and significant in both models 1 and 2, but the most robust indicator is that of the Papal state, always negative and significant in all specifications. This evidence is consistent with those found in other recent studies that stress the role of theocracies on economic outcomes.⁴⁸ In particular, Rubin (2011) identifies in the greater degree to which political authorities were dependent on the dictates of the religious authorities for legitimacy in early Islam one of the main reasons why economic development retarded in the Middle East relative to Western Europe. In the Papal state the Pope was both the political and religious authority and the administrative hierarchy of the government was fully subordinate to the administrative hierarchy of the religion. As also documented in **Appendix B2** this caused on the eve of the Italian unification process the Pope territories to have the most inefficient and corrupt bureaucratic apparatus. It is also widely documented how the Counter-Reformation negatively

⁴⁶Again, to avoid perfect multicollinearity we exclude Independent states from the regression analysis.

⁴⁷Among the most recent studies see Guiso et al. (2008), de Blasio and Nuzzo (2010) and Giordano and Tommasino (2011).

⁴⁸See for example Botticini and Eckstein (2011) and Becker and Woessmann (2009) who investigate the role of religion and its role on education educational outcomes for development.

influenced this area and the Spanish dominated ones⁴⁹

Further, second stage results now offer a different picture. First of all, our institutional quality coefficients are always positive and significant in all specifications, thus confirming the expected relation existing between the performance of informal institutions and productivity. Further, the value of the coefficient on our main indicator is fairly stable in models 1 to 4 and would imply that the difference between the performance of the governing institutions in Caserta (the province showing the lowest indicator) and that of Gorizia (the highest) explains between approximately 28% to 33% gap in productivity levels. The only exception is model 2, but in this case the over-identifying test is rejected. Note that our results are similar to previous ones found in empirical micro analysis.⁵⁰

Second, even the values of the always positive and significant coefficient on our human capital control are fairly stable, with numbers implying a 28% increase in productivity levels if the province with the lowest human capital endowments (Caltanissetta and Agrigento, both located in Sicily) would invest more in human capital accumulation than other areas and catch up with the best performer, that is, Rome.

Third, as before, additional variables, including extorsions, are never significant. Thus, it seems that the inclusion of our main controls, quality of institutions and human capital, leaves no significant role for further geography or additional factors. Interestingly, Acemoglu et al. (2001) and (2012) find similar results when they control for geography in their cross-country dataset.⁵¹

Finally, the strength of the instruments is much higher than the first approach. In particular, unlike results in section ?, confidence regions constructed using the CLR test always show bounded confidence intervals and zero is never included. Thus, this excludes the possibility that there exist no relationship between quality of institutions and total per worker VA, while lower and upper bounds in the CLR tests often suggest that the effect of the quality of institutions could be even larger.⁵²

⁴⁹For more on this see Appendix A2.

⁵⁰See, for example, Carlin et al. (2010); using micro data from a survey of managers perceptions of the impact of institutions they estimate an aggregate impact on output of increasing public inputs in low-income countries to the high-income level of about 20 percent.

⁵¹See also Rodrik et al. (2004). Finally, note that in a previous draft of the paper we find a very similar result introducing a dummy for southern regions. See Di Liberto and Sideri (2011).

⁵²Main exceptions are in model 1, where confidence regions constructed using the CLR test are very similar to

5 Robustness checks

This section examines whether our previous results on the overall positive role of institutional quality for development are robust to a number of changes in the model specification. In particular, we will check if the results of our second approach shown in Table 7 are robust to the inclusion of further social capital and cultural controls, and the use of different measures of regional economic performance.

We start from the first concern, that is, that regional differences in institutions efficiency are acting as a proxy for some further omitted variable. As said in section 2, one of the most important controls in this context is social capital or, more precisely, alternative specific aspects of it that may be correlated with our measure of government efficiency.

In general, our analysis is related to the vast literature on social capital and development, where the specific analysis of the Italian regions case dates back to Banfield (1958) and Putnam (1993) who also firstly raised the hypothesis that the observed within-country heterogeneity in informal institutions could be traced back to their distant histories. In these studies differences in economic performance across Italian regions are explained by different social capital endowments, with the latter showing a high persistency over time.⁵³

To address this question, we therefore include to our basic IV specifications our alternative cultural and social capital indicators at regional NUTS3 level. The main one is the composite measure of social capital provided by Cartocci (2007), described in Section 2, which should capture the role of specific generalized morality, pro-social behavior and interest in politics.⁵⁴ As a second indicator we include the percentage of religious Catholic weddings. In principle it might be that, once the role of widely used measures of social capital and culture is taken into account, no role is left for the efficiency of institutions as an independent determinant of economic development.

Table 8 shows our new results using the dominations' matrix approach. We firstly run a simple model excluding our quality of institutions measure in which economic performance is only

the Wald ones, and model 10 where, again, we observe that the interval constructed using the CLR test become unbounded suggesting lack of identification.

⁵³More recent papers are Guiso et al. (2008), Tabellini (2010), de Blasio and Nuzzo (2010), Mauro and Pigliaru (2011) and Giordano and Tommasino (2011).

⁵⁴The same variable has been used in Mauro and Pigliaru (2011) and Giordano and Tommasino (2011).

explained by our main alternative social capital indicator (model 1). In this case we find that the coefficient on social capital is significant and have the expected positive sign. Next, we run additional regressions including our alternative social capital variable together with our main index of institutional efficiency and human capital (model (2)) and find that the former is now non significant and also show an unexpected negative sign. Same results are found when the catholic weddings indicator is included (model 3) and also when we use more controls in our specifications. In general, results on our quality of institutions indicator are invariably positive and significant while, as in model (5) additional variables, when significant, show the wrong sign.⁵⁵

Our investigation therefore suggests that the effect of social capital on output might operate mainly or exclusively through the functioning and effectiveness of government institutions and that other specific factors, such as managerial practices or specific factors affecting the efficient provision of public services may be also playing an important role.⁵⁶ Similar evidence on a regional Italian sample has been found in Tabellini (2010). In this case results show that introducing a measure of the quality of government institutions (measured by the average number of years needed to complete a first-degree civil lawsuit in courts) the effect of culture, a variable that closely resembles what in other studies is called social capital, is significantly weakened: as in our case the coefficient of the latter becomes negative and insignificant.⁵⁷

Secondly, we investigate our second point, that is, the sensitivity of results to a change in the dependent variable. In Table 9 we therefore replicate the analysis using alternatively as dependent variable per worker Value Added in the three specific sectors, of agriculture, industry and services. Unfortunately our dataset does not allow us to distinguish between private and public services and results on the latter sector have to be taken with caution. Two reasons justify the use of the

⁵⁵We expect multicollinearity is playing some role in these results. See the correlation matrix in table ???. Conversely, they do not depend on 1) the endogeneity/exogeneity assumption of social capital, as we find almost identical results in both cases 2) the presence/absence of the human capital indicator.

⁵⁶On this see Knack (2002) and Tabellini (2008) that both find culture to be strongly correlated with the functioning of government institutions across U.S. States (the former) and in a cross-country sample (the latter). More recently, Mauro and Pigliaru (2011) find that in Southern Italian regions the negative economic impact of otherwise constant low endowments of social capital has significantly increased as a consequence of a process of administrative decentralization occurred during the 70s. In their model, devolution processes, making the local level of government responsible for the provision public goods, imply the latter is more likely to be influenced by local social capital levels.

⁵⁷In Tabellini (2010) culture is measured by the first principal components extracted from four cultural variables (control, obedience, respect, trust). In this case, social capital is mainly captured by trust (having trust in other people) and respect.

sectoral analysis. First, it is likely that institutional efficiency affects some sector more than other. Secondly, public sector efficiency may indeed affect total productivity through both a direct and an indirect channel, the first relating to changes of productivity within the public sector, the second by triggering off productivity in private production. Moreover, the role of our set of covariates, may change. In particular, we could expect to find a different role for technology (and, thus, human capital) and geography in the different sectors. The use of sectoral measures of regional economic performance as dependent variables enables us to address, even if imperfectly, this issue as well.

Table 9 introduces the sector-specific results on three main models: the parsimonious specification (model 1), the model with human capital as additional regressor (model 2) and the full specification that includes geography and extorsions (3). Only second stage results are included since first stage results are identical to that shown in Tables 7. Results differ across the different sectors. In particular, when we focus on the Agricultural sector, we finally find a role for geography and, in particular, for average temperature, that becomes positive and significant. Despite being a popular indicator, usually introduced as a proxy for geographical distance in this literature in our within country analysis latitude does not seem to matter. Conversely, the coefficient on human capital remains positive but it is never significant. Results on the service sector are similar to that found for Industry but for our main regressor, institutional quality that becomes non significant in model (3). In fact, the main result arising from Table 9 is that our quality of institution proxy is almost invariably positive and significant only for the industrial sector. That is, even if not conclusive, this evidence suggests that the quality of government institutions acts mainly through an indirect effect on other sectors rather than on a direct effect on the public sector output, and that improving the performance of the public sector significantly affect the most innovative and rather than the more traditional sectors.

6 Conclusions

This paper investigates if the quality of the public sector played a role in the economic development of Italian regions. Overall, this analysis suggest a significant role of past historical institutions on the current public administration performance through a legacy of informal institutions that still affect the public administration performance and we find evidences of a negative effect of

Spanish, Norman and Papal dominations in our first stage results. Most of all, second stage regressions show that the the public administration performance matters for explaining current regions economic performance and this result is robust to different models specifications checks that include geography, human capital and additional indicators of social capital and culture. In particular, it seems that introducing a measure of the quality of government institutions the effect of standard broad measures of social capital is significantly weakened. This study also offers some suggestions to understand why old norms and institutions would be still affecting the Italian regional public sector performance. The presence of significant institutional differences in the Italian pre-unitary territory followed by lack of enforcement of the common institutions designed in the newborn Italian state implied that the legacy of past dominations still survives in current informal institutions. That is, as argued by North (1990), we find that "...Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions, and codes of conduct are much more impervious to deliberate policies".⁵⁸

⁵⁸(North 1990, p. 6).

Riferimenti bibliografici

- [1] Acemoglu, D., Johnson, S. and Robinson, J. A. (2001), The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review*, Vol. 91 (5), 1369-1401.
- [2] Acemoglu, D., Johnson, S. and Robinson, J. A. (2002). Reversal of Fortune: Geography and Institutions in the Making of the Modern World, *Quarterly Journal of Economics*, 117, 1231-1294.
- [3] Afonso, A., Schuknecht, L. and Tanzi, V. (2005). Public Sector Efficiency: An International Comparison, *Public Choice*, 123 (3-4), 321-347.
- [4] Angrist, J. and Pischke, S. (2010), The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics, *Journal of Economic Perspectives*, vol. 24(2), 3-30.
- [5] Banfield, E. G. (1958). *The Moral Basis of a Backward Society*. New York: Free Press.
- [6] Banerjee and Iyer (2005), History, Institutions and Economic Performance: The Legacy of Colonial Land Tenure Systems in India, *The American Economic Review*, Vol. 95, No. 4, pp. 1190-12
- [7] Becker, S., K. Boeckh, C. and Woessmann, L. (2011), The Empire Is Dead, Long Live the Empire! Long-Run Persistence of Trust and Corruption in the Bureaucracy, IZA Discussion Paper No. 5584.
- [8] Becker, S. and Woessmann, L. (2009), Was Weber Wrong? A Human Capital Theory of Protestant Economic History, *The Quarterly Journal of Economics*, vol. 124(2), 531-596.
- [9] Berkowitz, D. Pistor, K. Richard, J. (2003), LEconomic development, legality, and the transplant effect, *European Economic Review*, vol. 47, No. 1, 165-195.
- [10] Boix, C. and Posner, D. (1998), Social Capital: Its Origins and Effects on Governmental Performance, *British Journal of Political Science*, 28, 4. 686-693.

- [11] Bosker, M. and Garretsen, H. (2009), Economic development and the geography of institutions, *Journal of Economic Geography*, 9, 295-328.
- [12] Botero, M. Ponce, A. and Shleifer, A. (2012), Education and the Quality of Government, mimeo.
- [13] Botticini, M. and Eckstein, Z., (2011), The chosen few: how education shaped Jewish history, 701492, Princeton University Press, forthcoming.
- [14] Caravale, M. and Caracciolo, A. (1978), Lo Stato pontificio da Martino V a Pio IX, UTET.
- [15] Carlin, W., Schaffer, M. and Seabright, P. (2010), A Framework for Cross-Country Comparisons of Public Infrastructure Constraints on Firm Growth, CEPR Discussion Papers no. 7662.
- [16] Cartocci, R. (2007), Mappe del tesoro. Atlante del capitale sociale in Italia. Il Mulino, Bologna.
- [17] Chong, A., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2012), Letter grading government efficiency, mimeo.
- [18] Ciccarelli, C., Fenoaltea, S., Proietti, T., (2010), The effects of unification: policy and cyclical convergence in Italy, 1861-1913.
- [19] Cozzi, G. and Knapton, M. (1986), La Repubblica di Venezia nella modernità, in Storia d'Italia, Vol. XII, UTET.
- [20] Croce, B. (1922), La Spagna nella vita italiana durante la Rinascenza, Laterza.
- [21] Daniele, V. and Malanima, P. (2012) Il divario Nord-Sud in Italia 1861-2011, Rubbettino.
- [22] De Blasio, G. and Nuzzo, G. (2010), Historical traditions of civicness and local economic development, *Journal of Regional Science*, 20(10), 1-29.
- [23] Drelichman, M. and Voth, H. (2011), Lending to the borrower from hell: debt and default in the age of Philip II, *Economic Journal*, 121, 1205-1227.

- [24] Detotto, C., Sterzi, V. (2010) The role of family in suicide rate in Italy, Working Papers Crenos no. 20.
- [25] Di Liberto, A. (2008). Education and Italian Regional Development, *Economics of Education Review*, vol. 27, no.1, 94-107.
- [26] Di Liberto, A. and Sideri, M. (2011). Past dominations, current institutions and the Italian regional economic performance, Working Paper CRENoS no. 15.
- [27] Drelichman, M. (2009), License to till: The privileges of the Spanish Mesta as a case of second-best institutions, *Explorations in Economic History*, vol. 46, 220240.
- [28] Drelichman, M. and Voth, H. J., (2011), Lending to the borrower from hell: debt and default in the age of Philip II, *Economic Journal*, vol. 121, 1205-1227.
- [29] Dunan, M., Piverteau, J., Baumont, M., Delorme, J., Fossier, R., Mazoyer, L., Ruhlmann, G. and Ristelhueben, R. (1965), *Storia Universale*, Vol. I, Rizzoli.
- [30] Eicher, T. and Leukert, A. (2009), Institutions and Economic Performance: Endogeneity and Parameter Heterogeneity, *Journal of Money, Credit and Banking*, 41(1), 197-219.
- [31] Engerman, S. and Sokoloff, K. (1997), Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View from Economic Historians of the United States, in *How Latin America Fell Behind* (Haber S. ed.), Stanford University Press.
- [32] Engerman, S. and Sokoloff, K. (2000), History Lessons Institutions, Factor Endowments, and Paths of Development in the New World, *Journal of Economic Perspectives*, vol. 14(3), 217-232.
- [33] Evans, P. and Rauch, E. (1999), Bureaucracy and Growth: A Cross-National Analysis of the Effects of Weberian State Structures on Economic Growth, *American Sociological Review*, Vol. 64, No. 5, pp. 748-765
- [34] Fiaschi, D., Gianmoena, L. and Parenti, A. (2011), The dynamics of labour productivity across Italian provinces, *Rivista Italiana degli Economisti*, Vol. 2.

- [35] Flora, P., Kuhnle, S. and Urwin, D. (1999), *State formation, Nation Building, and mass politics in Europe*, Oxford University Press.
- [36] Galasso, G. (1994), *Alla periferia dell'Impero, La Spagna imperiale e il Mezzogiorno*, Einaudi.
- [37] Galasso, G. (2005), *Il Regno di Napoli, Il Mezzogiorno angioino e aragonese (1266-1494)*, vol. 15(1), UTET.
- [38] Giordano, R. and Tommasino, P. (2011), *Public sector efficiency and political culture*, Working Papers Banca d'Italia n.786.
- [39] Glaeser, E. and Shleifer, A. (2002), *Legal origins*, *Quarterly Journal of Economics*, vol. 117(4), 1193-1229.
- [40] Guiso, L., Sapienza, P. and Zingales, L. (2008), *Alfred Marshall Lecture - Social Capital as Good Culture*, *Journal of the European Economic Association*, vol. 6(2-3), 295-320.
- [41] Guiso, L., Sapienza, P. and Zingales, L. (2011), *Civic Capital as the missing link*, *Handbook of social economics* (J. Benhabib, A. Bisin, M. Jackson eds.), Elsevier.
- [42] Hall, R. and Jones, C. (1999), *Why Do Some Countries Produce So Much More Output Per Worker Than Others?*, *Quarterly Journal of Economics*, vol 114(1), 83-116.
- [43] Helmke, G. and Levitsky, S. (2004), *Informal Institutions and Comparative Politics: A Research Agenda*, *Perspectives on Politics*, vol. 2(4), 725-740.
- [44] Ichino, A. and Maggi, G., (2000), *Work Environment And Individual Background: Explaining Regional Shirking Differentials In A Large Italian Firm*, *The Quarterly Journal of Economics*, vol. 115(3), 1057-1090.
- [45] ISTAT (2006), *Atlante statistico dei comuni*, Istituto Centrale di Statistica, Roma.
- [46] ISTAT (2008), *Atlante statistico territoriale delle infrastrutture*, Istituto Centrale di Statistica, Roma.

- [47] Knack, S., Keefer, P. (1997), Does Social Capital Have an Economic Payoff? A Cross-Country Investigation, *The Quarterly Journal of Economics*, Vol. 112, No. 4, pp. 1251-1288
- [48] Knack, S. (2002). Social Capital and the Quality of Government: Evidence from the States, *American Journal of Political Science*, 46, 772785.
- [49] La Porta, R., Lopez-de-Silanes F. and Shleifer, A. (1999), The Quality of Government, *Journal of Law, Economics, and Organization*, 15, 222279.
- [50] La Porta, R., Lopez-de-Silanes F. and Shleifer, A. (2008), The Economic Consequences of Legal Origins, *Journal of Economic Literature*, 46, 285332.
- [51] Mauro, L. and Pigliaru, F. (2011). Capitale sociale, crescita e shock istituzionali: cosa ci insegna il caso del Mezzogiorno, in *Il Capitale Sociale*, Sestito P. and De Blasio G, eds., Donzelli, Roma.
- [52] Melis, G. (1996), *Storia dell'amministrazione italiana (1861-1993)*, Il Mulino, Bologna.
- [53] Merlin, P. (1994), Il Piemonte sabauda: Stato e territori in et moderna, in *Storia d'Italia*, vol. VIII (G. Galasso ed.), ed. UTET, Torino.
- [54] Montanelli, I. and Gervaso, M. (2003), *Storia d'Italia*, vol. 2 and 3, RCS.
- [55] Moreira, M. (2009). Tests with correct size when instruments can be arbitrarily weak, *Journal of Econometrics*, vol. 152(2), 131-140.
- [56] Murray, M. (2006), Avoiding Invalid Instruments and Coping with Weak Instruments , *Journal of Economic Perspectives*, 20, 4, 111132.
- [57] North, D. (1990), *Institutional change and economic performance*, Cambridge University Press.
- [58] North, D. and Thomas R. (1973), *The rise of the western world*, Cambridge University Press.
- [59] Nunn, N. (2009), The Importance of History for Economic Development, *Annual Review of Economics*, vol 1, 65-92.

- [60] Pande, R. and Udry, C. (2005), Institutions and Development: A View from Below, *Yale University Economic Growth Center Discussion Paper* No. 928.
- [61] Putnam, R. (1993), Making Democracy Work: Civic Tradition in Modern Italy, *Princeton University Press*.
- [62] Rodrik, D., Subramanian, A. and Trebbi, F. (2004), Institutions rule, the primacy of institutions over geography and integration in economic development, *Journal of Economic Growth*, 9, 131-165.
- [63] Roland, G., Verdier, T. (2003), Law Enforcement and Transition, *European Economic Review*, vol. 47, No. 4, 669-685.
- [64] Rubin, J. (2011), Institutions, the rise of commerce and the persistence of laws: interest restrictions in Islam and Christianity, *Economic Journal*, vol. 121, 1310-1339.
- [65] Sella D. and Capra, C. (1984), Il Ducato di Milano dal 1535 al 1796, UTET.
- [66] Staiger, D. and Stock, J.H. (1997), Instrumental variables regression with weak instruments, *Econometrica*, 65(3), 557-586.
- [67] Stock, J.H. and Yogo, M. (2005), Testing for weak instruments in linear IV regression, in Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg, *Cambridge University Press*, 80-108.
- [68] Stock, J.H., Wright, J. and Yogo M. (2002), A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments, *Journal of Business and Economic Statistics*, vol. 20(4), 518-29.
- [69] Tabellini, G. (2010), Culture and institutions: economic development in the regions of Europe, *Journal of the European Economic Association*, 8, 677-716.
- [70] Tabellini, G. (2008), Presidential address: Institutions and Culture, *Journal of the European Economic Association Papers and Proceedings*, 6, 255-294.
- [71] Various Authors (1997), I percorsi della storia Atlante, De Agostini.

- [72] Voigtlander and Voth (2012). Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany, *The Quarterly Journal of Economics*, 127(3), 1339-1392.

A Data sources

DEPENDENT VARIABLES

- Total value added per worker: average 2002-2005, in euros. From Istat (2006).
- Value added per worker in the agricultural sector: average 2002-2005, in euros. From Istat (2006).
- Value added per worker, in the industrial sector: average 2002-2005, in euros. From Istat (2006).
- Value added per worker in the service sector: average 2002-2005, in euros. From Istat (2006).

CONTROLS Our our main PA performance indicator, is calculated as the first principal component of the following specific indices:

1. Environment:

- functioning purification plant every 100 plants,
- purification plants under construction every 100 existing plants,
- tons of wastes for separate refuse collection for 100 tons of urban wastes,
- plants of urban waste disposals every 1,000,000 citizens,
- yearly average capacity of incineration plants for 100 tons of urban wastes
- dumps for special wastes every 10,000 square kilometers.

2. Energy:

- gross production of electric energy from renewable sources for 1,000 square kilometers.

3. Health:

- utilization rate of beds in the public health institutes
- number of workers in the residential socio-assistential health point every 1,000 citizens.

4. Education:

- public elementary schools provided with meals every 100 schools,
- public elementary schools equipped with school-bus every 100 schools
- special classrooms of the public secondary schools every 100 classrooms.

All these indicators are elaborations from ISTAT (2008) data.

Additional controls

5. Education (average years): it is measured as the average years of schooling of the labor force, that is:

$$\text{Average years of schooling} = \sum_j YR_j * HK_j \quad (\text{A.1})$$

where j is the schooling level, YR_j is the number of years of schooling represented by level j , and HK_j is the fraction of the labour force for which the j th level of education represents the highest level attained. Within the Italian system, primary school lasts eight years, the secondary level is usually attained after five years, and university courses take four to six years.

6. Social capital: it is a broad measure of social capital at regional NUTS3 level that merges data on 1) blood donations, 2) sport participation, 3) dissemination of newspaper and 4) voter turnout. From Cartocci (2007).
7. South: dummy variable equal to one if the province is located in the following NUTS(2) regions, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia e Sardegna.

B Historical (stylized) facts

B.1 Bureaucracies in pre-unitary states and the post-unification process

The Italian unification process took place in 1861, approximately two hundred years later than most large European Western States and under the aegis of an absolutist state, the Kingdom of Sardinia.⁵⁹ In order to classify the bureaucracies in the different regimes, we focus on three main characteristics: meritocratic recruitment, predictable career ladders and compensation practices. In fact, these are considered as crucial element in order to identify the presence of a professional bureaucracy in a state, while the latter is usually correlated with a higher efficiency in public goods provision and, therefore, with economic performance.⁶⁰ We begin our analysis with the kingdom of Sardinia, the state which unified the whole peninsula, segue la descrizione degli altri stati.

- **Kingdom of Sardinia.** In this State the nobility loyal to the Crown had the leadership of the public apparatus creating a sort of *bureaucratic aristocracy*. Thus, the relationship of fidelity to the king was prominent, but elements of new bureaucratic professionalism and the presence of a career ladder in the modern sense can be also identified.
- **Habsburg in Lombardy and Venetia.** Unlike most pre-unitary Italian states, the social origins of the Austrian bureaucracy were not from the noble but from the middle-class. In general, the Habsburg bureaucracy is known as well functioning.⁶¹ The Austrian regime introduced new procedures for the employment in the public sector based on meritocratic rules with the enhancement of educational requirement for access to the place, the apprenticeship, the mobility between offices and positions. The latter rule was implemented in order to broke the link of the official with the territory of origin, and oppose the "nobilato" (or *bureaucratic aristocracy*) offices. Thus, renewed Austrian rule in the Italian territory had given space to

⁵⁹The two belated nations in Western Europe are Italy and Germany, whose unification took place after 1815. For most remaining states, the process of state formation started See Flora *et al.*(1999)

⁶⁰Weber has been probably the first to stress the idea that the presence of a professional bureaucracy, also called *weberian* bureaucracy, in a state leads to more efficiency in public goods provision and it is therefore good for its development. For more on this see Evans and Rauch (1999) and, more recently, Chong *et al.* (2012)

⁶¹"The Habsburg Empire is historically known as a multi-ethnic state with a relatively well functioning, respected bureaucracy". See Becker et al. (2011) p. 2. They investigate if the Habsburg Empire, with its localized and well-respected administration, increased citizens trust in local public services.

the needs of the new bourgeois groups among bureaucrats and gave raise to the most efficient and professional bureaucratic apparatus of the peninsula.

- **Regno di Napoli (e delle 2 Sicilie poi).** The public sector organization has been described as mostly inconsistent and contradictory. Along with some of the characteristics of a bureaucratic professionalisation (mobility in the office, residence requirement, service mentality to the state) we also observe old and inefficient administrative practices that survived any innovations attempt. This was observed especially in the peripheral areas where bureaucrats were still selected for the most part among noble families, and behaved more like the old Spanish bureaucracy than the more modern Bourbon.
- **Stati del papa.** Until the eve of the unification of Italy, this was the pre-unitary state with the most corrupt and primitive bureaucratic apparatus. Senior officials were all of noble extraction and up to half of the 1800 general rules of recruitment and promotion did not existed: "...offices had poured in a state of widespread abandonment, the *raccomandazione* was the key input for a career in public administration, the pay gap between ecclesiastical and civil employees (for the benefit of the first) was significant, the prevailing corruption and dishonesty, failure to comply with office hours and duties of the employee, the held disastrous archives were the most visible signs of primitivism of the administrative model".⁶²
- **Minor States.** In the minor states we observe the influence of two different external models. Both the Duchy of Parma and Piacenza and the Grand Duchy of Tuscany introduced the Austrian model as in the Lombardy and Venetia, while the Duchy of Modena and Reggio Emilia and that of Lucca created their bureaucratic apparatus influenced by the King of Sardinia model.

This was the situation inherited in 1861 by the Kingdom of Sardinia. In terms of number, compared to other European countries, the pre-unitary Italian public sector did not appear oversized. More precisely, in 1859, two years before the unity, the number of employees in the public sector in pre-unitary states reached a total of 42,586.⁶³ The largest number (17 123) was in the **Kingdom**

⁶²Melis (1998) p. 17.

⁶³This does not include magistrates and teachers. Melis (1998)

of the **Two Sicilies**, 7409 in **Lombardy-Venetia**, 7240 in the **Kingdom of Sardinia**, 5273 in the **Papal States**, 3149 in **Tuscany**, 1398 in the Duchy of Modena and, finally, 995 in the Duchy of Parma.

The design of the new Italian state and its bureaucracy organization was inherited from that of the Kingdom and it was based on the French model, that is, that of a highly centralized state that left a low level of autonomy to peripheral areas.⁶⁴ Indeed, the implementation of a federal state rather than a centralized one was seen by Piedmont as a dangerous strategy given the territorial differences of the country and, in particular, of the southern areas.

Therefore, why even so many years later, in vast areas of the country we still apparently observe the persistency of old institutions?⁶⁵ It is possible to trace the roots of this phenomenon on the choices done by the Savoy Crown immediately after the unification process. First, the Public sector employees prior to unification were kept in place and became the bureaucrats of the newborn state but, in most cases, they were hostile to changes. Second, monitoring and enforcing activities were reduced rather than increased by the central Government. This resulted in significant differences in administrative practices and procedures (*prassi amministrative*) within the country, with even the same Prefects, the State's representatives in the provinces, acting differently ...depending on the latitude where they were called to work.⁶⁶ Finally, unlike its French model, the new Italian state has not created the equivalent of the *grands corps* or the *oxbridge* school, that in France and UK were used to select and for the initial training of senior officials in the PA ranks. Conversely, since the beginning of the unitary experience, in Italy the selection and training of bureaucrats has been governed by the administration itself, with serious consequences of social isolation of the bureaucracy, with the career ladder mainly determined by seniority rather than merit (Melis, 1998, p. 43).

In sum, since its infancy, the Italian Government has suffered from lack of rules enforcement from the centre to the periphery and this is often named by historians as an example of *weak*

⁶⁴(Flora et al. (1999). See also La Porta et al. (1999) for a description of the French origins of the Italian legal system.

⁶⁵Transplanted appear when "...changes in the law on the books...(have)...relatively little impact on the effectiveness of (legal) institutions." Berkowitz et al. (2003). On this, see also Roland and Verdier (2003).

⁶⁶"... as happened in Palermo where the prefect Torelli perpetuated the Bourbon practice to hold public hearing on fixed days, and he did it, as the Bourbon viceroy had done for decades, ritually seated in the throne room." Melis 1998, p. 84.

centralism (Melis, 1998). A good example of how difficult has been the enforcement of the new rules is represented by compulsory schooling laws. We use this example because the newly born Italian Government and its Ministry of Education were highly committed in fighting illiteracy, a problem that plagued vast areas in the country, and many data and documents are available.

The first law after the unification occurred in 1877 and established three years of compulsory schooling and, for the first time, with penalties for non-compliant.⁶⁷ Before that 1877 reform, the obligation was therefore only *pro-forma*. In 1904 it was required to bring compulsory schooling to fifth grade (and 12 years of age). In 1923 the limit has been further extended to 14 years olds and in 1948 it also became a constitutional law.⁶⁸ All these policies remained largely unattended for a long time as the different laws have been only very weakly enforced. Illiteracy remained a widespread and persistent phenomenon that survived the IIWW and, still in 1960, only three out of ten Italians have attended the full eight years of compulsory schooling.⁶⁹ In fact, almost 70 years had to pass in order to observe full enforcement of the compulsory schooling law in Italy: the cohort born in 1976, that is, those who obtained the compulsory school license of 8 years of schooling in 1990 has finally fully attended 8 years of compulsory schooling as required by the 1923 law.⁷⁰

⁶⁷The origin of the Italian public school system is identified in 1859, that is, just before the birth of the Italian State in 1861. It was the Piedmont parliament that in 1959 approved/passed the law stating that primary education was free for all pupils but only for the first two years (in rural areas and small towns) or 4 years in larger urban areas.

⁶⁸Primary education, given for at least eight years, is compulsory and free of tuition. Italian Constitution, Article 34, 1948.

⁶⁹Only during the 1960s things have improved even if not quickly. In 1963, the year of implementation of a new reform of the schooling system, among those born of 1949 45% completed compulsory schooling. For the cohort born in 1952, the first to benefit from this reform, the percentage of students completing compulsory schooling was only 61.82%.

⁷⁰See Vittorio and Malanima?

B.2 The construction of the second set of instruments

In order to clarify how our second set of instruments have been constructed, we briefly describe some historical facts that occurred in the Italian provinces between the 10th and the 17th century. Moreover, this information would also help us in defining the influence that the different historical institutions may have had in each territory.

During this long period the Italian peninsula has been characterized by a series of continuous administrative and border changes. Therefore, we need to make some simplifying assumptions in order to construct the matrix. First of all, problems arise since, in many cases, the borders of modern provinces do not perfectly correspond to those of the ancient states. We solve this issue by assigning the province to the domination that administrated the majority of its territory.⁷¹

A second difficulty concerns the real power and influence exerted by the political dominator. In particular, historians suggest that many formally independent state/areas were, in fact, strongly influenced by foreign domination. Nevertheless, since the degree of foreign influence varies significantly (across periods and provinces) in this study we consider as independent also the provinces that were influenced by foreign powers. We believe this choice is the one least affected by a lack of objective criteria. To construct our matrix⁷² we finally identify ten main political dominations of the Italian provinces: Republic of Venice, Hapsburg-Austrian, Savoy, Papal state, the Normans, the Swabian, the Anjou, Aragonese, Bourbons, Independents. In the following we describe the different dominations starting with that located in the Northern, Centre and Southern part of Italy.

We open our brief historical appendix with the Republic of Venice. The Serenissima, as it was also known, has represented a great exception in the Italian political scenario. In fact, it has been the only state to preserve a full independence (not only *de iure* but also *de facto*) until 1797 when, with the Campoformio Treaty, it became part of the Austrian Empire. The Republic had an original form of government: it was oligarchic and the chief was the Doge. Even if this system was not democratic, it guaranteed a strong political stability that helped Venice to remain

⁷¹We prefer this choice to the alternative used by De Blasio and Nuzzo (2009), that attributes to the entire province the characteristic (regime) that was in place in the provincial capital (in the middle ages).

⁷²We have to thank Pierpaolo Merlin and Giangiacomo Ortu that helped us to find historical sources and discussed with us the most plausible simplifications we had to make in order to construct our matrix. Needless to say, all errors or omissions are our full responsibility.

independent against the different foreign powers during these centuries. Trade (with east and Far East) represented the major source of its economic prosperity and the Republic had also different colonies in the Mediterranean Sea. Only from 1453, when Turkish conquered Constantinople, Venice began to lose its commercial power in the sea and to become more important in the Veneto and in Lombardy. If the Republic managed to preserve its territories for centuries, it was thanks to its highly efficient administration⁷³. For these reasons, their policy should have had a positive impact on the institutional organization and we expect a positive effect.

The 16th century, instead, has been characterized, in part of the North-East, by the Hapsburg dynasty. They were in fact the foreign power that dominated Italy since 1713 after the Utrecht Treaty. With this agreement the Hapsburg conquered the Duchy of Milan, Sardinia (until 1720), the Kingdom of Naples (until 1734) and, since 1720, Sicily (until 1734 as well). In addition, their influence was also strong on Tuscany and on the Duchy of Parma and Piacenza. The Trentino, the Alto Adige and almost the whole Venezia Giulia were part of the Austrian Empire. This situation remained stable for the whole century; during this period the Empire was ruled by two important monarchs (Mary Theresa of Austria and Joseph II) and the chancellor Kaunitz, that managed to give their Empire a good administrative and bureaucratic organization in their territories including Italy. In addition, they implemented a strong and efficient judiciary system and they even attempted several economic reforms in favor of industry. In addition, it is also considered a period of religious tolerance during which Joseph II abolished the death penalty and the feudal privileges⁷⁴. In sum, the Austrian policies should have had a positive effect on local institutions. On this, see also Becker et al. (2011).

The influence played by the Savoy dynasty⁷⁵ is more ambiguous. It governed in the Aosta Valley during the whole period considered but very early, at the end of the 12th century, it gradually extended its territories to include almost the whole Piedmont. It became the only state, together with Venice, to have an autonomous policy without foreign influences. These territories have seen the formation of a modern organization, similar to those of the rest of Europe, with the gradual passage from a feudal state to a modern one. In 1720 the Duchy managed to obtain the Kingdom

⁷³Cozzi and Knapton (1986).

⁷⁴Montanelli and Gervaso (2003).

⁷⁵See also Merlin (1994).

of Sardinia with the royal title but their role in the administration of these territories is more ambiguous and it is fair to say that we can talk about a modern state (with a real eradication of feudalism form of government) only for the Northern territories. The government was characterized by a strong central power, an authoritarian bureaucracy and the fight against local nobility. Mainly during the 1700s (during the reign of Vittorio Amedeo) we witness the rise of the middle class with an increasing role of the University of Turin in creating a class of bureaucrats. Together with these reforms, mainly concentrated on a specific area close to Turin, the Savoy kingdom has also concentrated a lot of efforts in foreign policy since territorial expansion has always represented one of the main political objectives, maybe more than development policies. For all these reasons, we expect their overall impact on the institutional organization to be ambiguous.

In the Centre of Italy, a significant role over these centuries has been played by the Papal State. The territories of the Church included Lazio, Umbria, Marche and Emilia Romagna for the most part of the period examined. The Papal state is almost unanimously considered by historians as a bad administrator. In the few occasions in which it gave evidence of good administration, it was limited on the city of Rome. In all the other territories, for the whole period, there has been a perpetual diarchy between the religious and local powers. Often, this situation resulted in anarchy⁷⁶. The church and, therefore, the Government did not help improve the population educational levels the Counter-Reformation negatively influenced this area (and the Spanish dominated ones) more than other parts of the country. At the beginning of 1700, the Papal State had very few positive aspects: Negative balance of payment, wealth drain towards foreign countries, famines, lack or failure of any commercial, manufacturing and credit activities, public debt, administrative and fiscal disorganization [...] ⁷⁷. Therefore, the Papal state is expected to have had a negative influence on institutions.

In the Southern part of the country we find a more heterogeneous situation with different dominations that ruled and influenced the area during the observed period. The 12th century saw the Normans conquer the whole Mezzogiorno defeating Byzantines (in the South of Italy) and Arabians (in Sicily) under the leadership of the Altavilla family. Their purpose was to form a

⁷⁶Caravale and Caracciolo (1978).

⁷⁷Caravale and Caracciolo (1978).

state that was independent from little feudatories and administrated by high quality civil servants. Especially with William II, the Normans show their respect for population and for the national laws. Even if they were good administrators, it was a very troubled period for the Kingdom of Sicily because of the continuous internal (between sovereign and feudatories) and external fights⁷⁸. Overall, due to continuous wars of the period the net effect of this otherwise good administration is therefore ambiguous.

After Normans, we find the Hoenstaufen of Swabia that conquered the control of the South of Italy in 1194 after the weddings between Henry IV and Constance of Altavilla, last descendent of the Norman family. The Swabian kept the control of the Kingdom of Sicily (including the whole Mezzogiorno) until 1266. This is identified as a positive domination, especially for the role played by Frederick II, the emperor defined *Stupor Mundi* for his (also good administrative) qualities. His Constitution of Melfi was a new legal code for his Kingdom of Sicily and brought revolutionary changes, in particular, in reducing the influence of feudatories in his territories. His objective was to create a secular and well-ordered State and founded the University of Naples to shape a new ruling class that was able to administrate the territory and tried to stimulate the arts. In addition, he stimulated commercial links with all the Mediterranean countries. Unambiguously, we expect Swabian policies to have a positive impact on institutions.

The Mezzogiorno had to change its administration again in 1266, when the Anjou family, part of but independent from the regnant family of France, conquered the control of Southern Italy, with the help of Pope Clement IV. Their policies were based on a strong fiscal system, but also on the regular fights against local feudal nobility that sometimes resulted in continuous rebellions in Naples and in Sicily (then conquered by Spanish in 1282)⁷⁹ and, therefore, in formal anarchy. In addition, the entire territory was under a strict military control that forced population to live in a sort of perpetual state of siege with virtually no freedom. The main purpose of this policy was to abolish the modern state constructed by Swabian during the previous century. The continuous wars caused a drop in agriculture productivity and a huge amount of public expenditure allocated to military expenditure. Under the first years of Anjou domination, the Kingdom was considered

⁷⁸Montanelli and Gervaso (2003).

⁷⁹During the Vespro War. In 1442 Spanish conquered all the rest of Kingdom of Naples.

unanimously as one of the biggest Southern European and Mediterranean powers. Two centuries after, it is the big and sick Kingdom placed in the middle of three seas⁸⁰. With these premises, our judgment about Anjou is negative.

The Aragonese governed the South of Italy since 1442 (Sicily since 1282, Sardinia since 1420). This political situation remained stable until 1502, when all these territories went to the Spanish Crown. Since 1526 on, the Duchy of Milan too was conquered by Spain but, administrated by a governor, Milan had a wide autonomy at the bureaucratic level. The Aragonese period was relatively stable and positive period. Galasso (2005) emphasizes two policies adopted by Iberian monarchs: they built the basis for a modern absolutist state and considered their southern Italy territories as part of the Kingdom and not just a colony to exploit, while inefficiencies were probably due to the low quality of civil servants⁸¹. During the Spanish period the bureaucratic reforms continued with the same logic. The purpose was to strengthen the presence of the State in the different provinces and to guarantee the education of civil servants with the adequate administrative skills.⁸² However, since the second half of 16th century we observe a change: the viceroys began to strongly repress opponents and heretics, while feudal policies negatively affected the agricultural sector. Indeed, a well-organized bureaucracy loyal to the crown was needed and created but mainly to extract revenues through taxes and finance the expensive Spanish military campaigns. Philip II long war and money necessity are a well-documented example of this change in policies. The most cited example of an inefficient institution harmful for growth is the Mesta, a privilege conceded by the king to the shepherds not enforcing property rights.⁸³ Thus, the role played by the Spanish and Aragonese is overall negative.

The successors of the Spanish domination were the Bourbon family that in 1734 started to rule over the Mezzogiorno. Artisans and merchants, the only categories that could give energy to the economic system, were absent. They inherited badly administrated territories and a critical economic situation worsened with the expulsion of the Jews, ordered by Carlo of Bourbon because

⁸⁰Our translation from Galasso G. (2005).

⁸¹From Galasso (2005): The efforts made by the Aragonese dynasty were noticeable and rich of results.

⁸²Galasso G. (1994).

⁸³The King of Spain derived a significant part of his revenue from the Mesta, the national association of migratory shepherds, have often been blamed for the stagnant Spanish agricultural productivity. See North and Thomas (1973) p. 4 and Drelichman (2009). The negative effects of these new rules of the Spanish domination have particularly affected Sardinia, where a previous administration during the period of Giudicati had brought positive results.

of his great devotion to the Pope, that were able to guarantee a minimum of industrial activity. The Bourbon administrators tried to improve, with ambiguous results, the conditions of the City of Naples but put no or low efforts in the rest of the territories. In addition, they did not improve the educational system that Carlo Bourbon did not consider important. In sum, we do not expect a positive effect in the South of Italy of the Bourbon administration.

C Figures and Tables

C.1 Figures

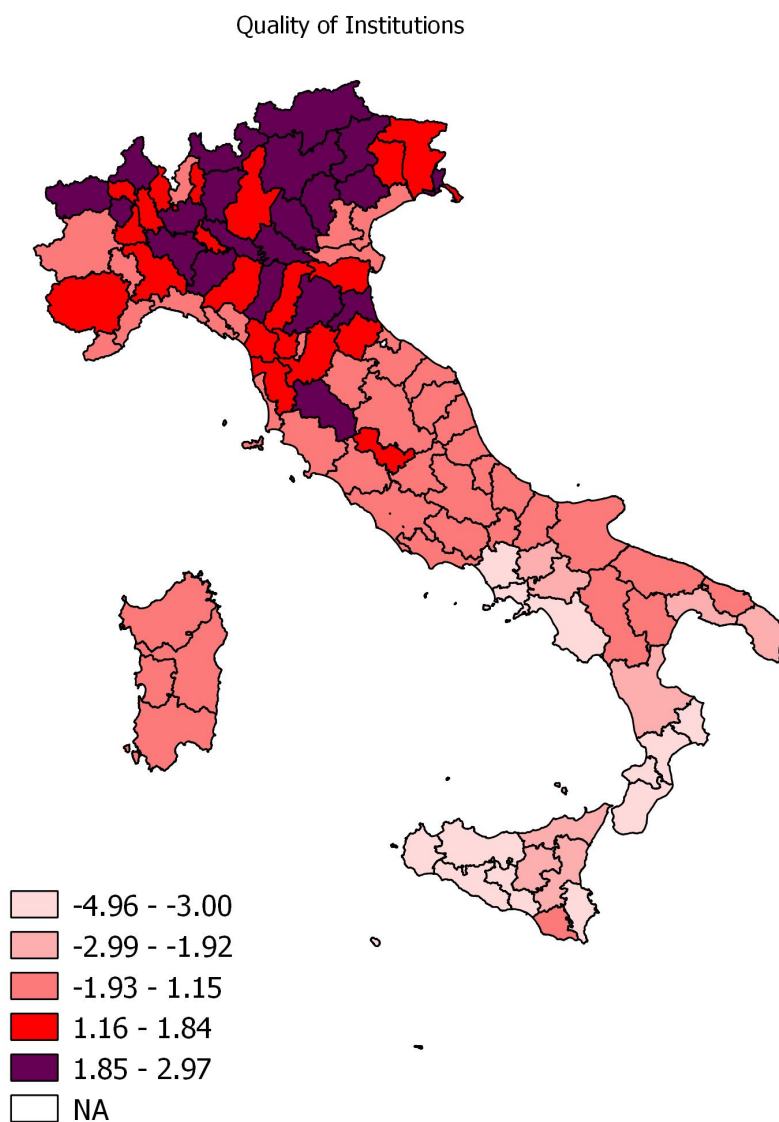


Figura 1: Institutional quality: territorial distribution

Notes: Figure 1 represents the territorial distribution across the 103 Italian provinces of our synthetic quality of institutions indicator calculated as the sum of four indicators on environment, energy, health and education. See ISTAT (2008).

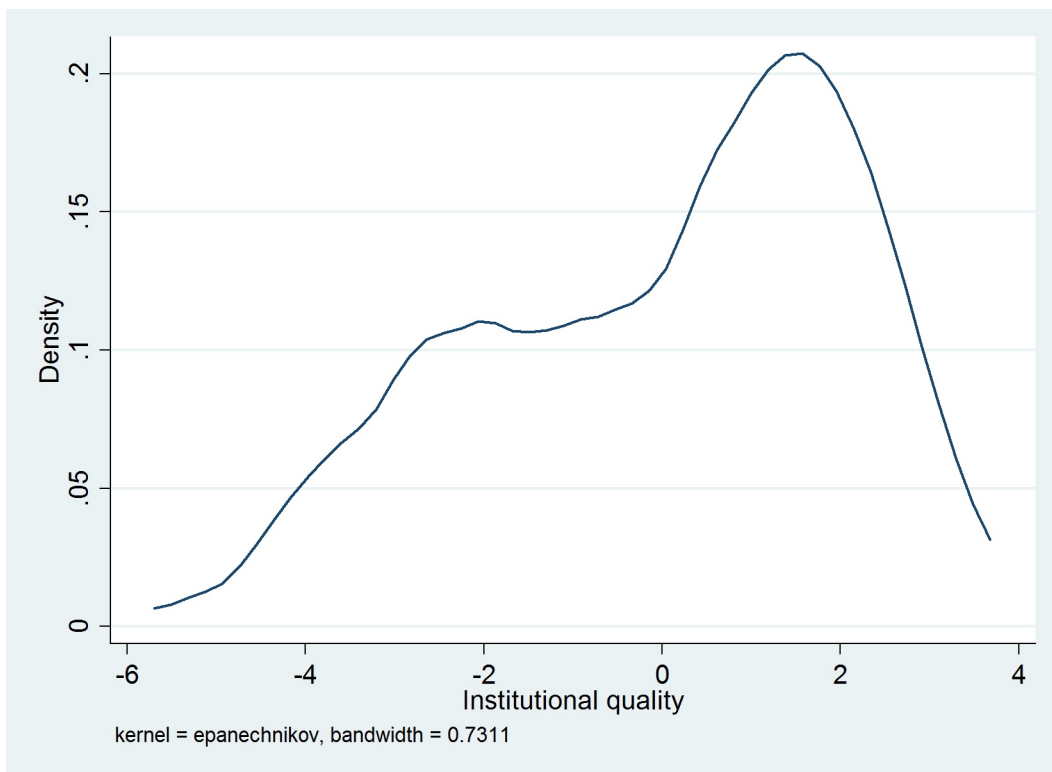


Figura 2: Institutional quality: kernel density distribution

Notes: Figure 2 represents the Kernel distribution across the 103 Italian provinces of our synthetic quality of institutions indicator calculated as the sum of four indicators on environment, energy, health and education. See ISTAT (2008).

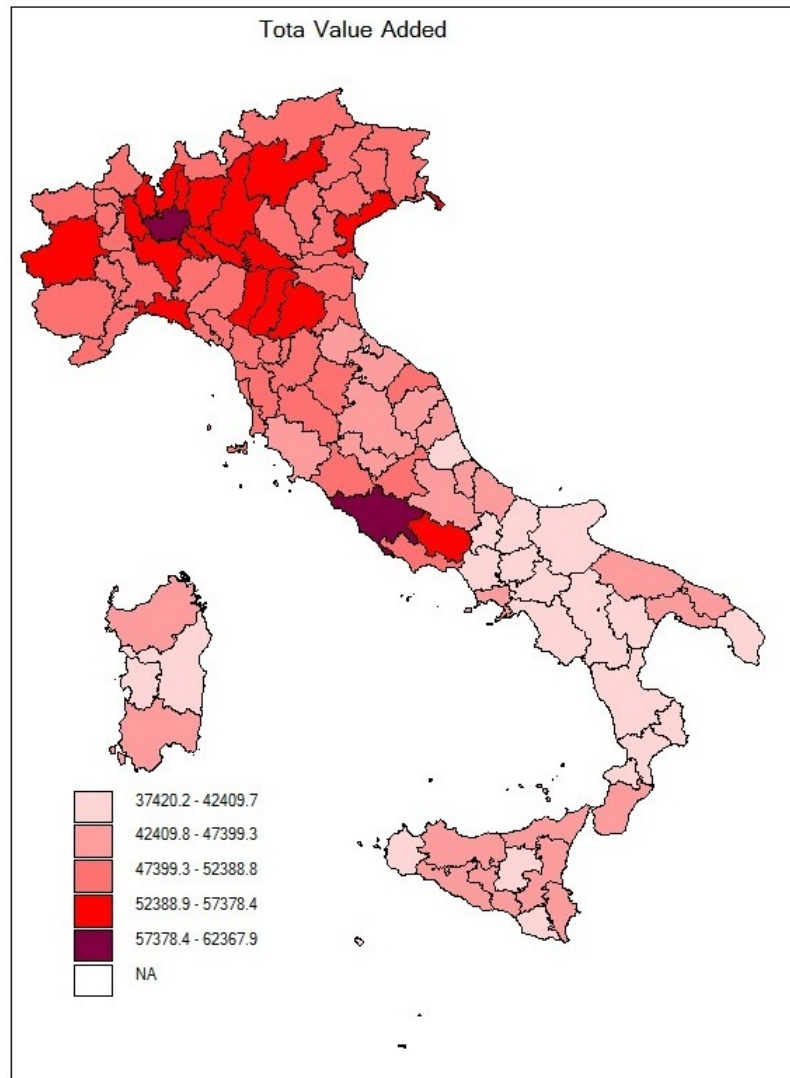


Figura 3: Total value added: territorial distribution

Notes: Figure 3 represents the Total VA territorial distribution across the 103 Italian provinces, where the latter is the value added per worker (in euros) measured as average 2002-2005. See ISTAT (2006).

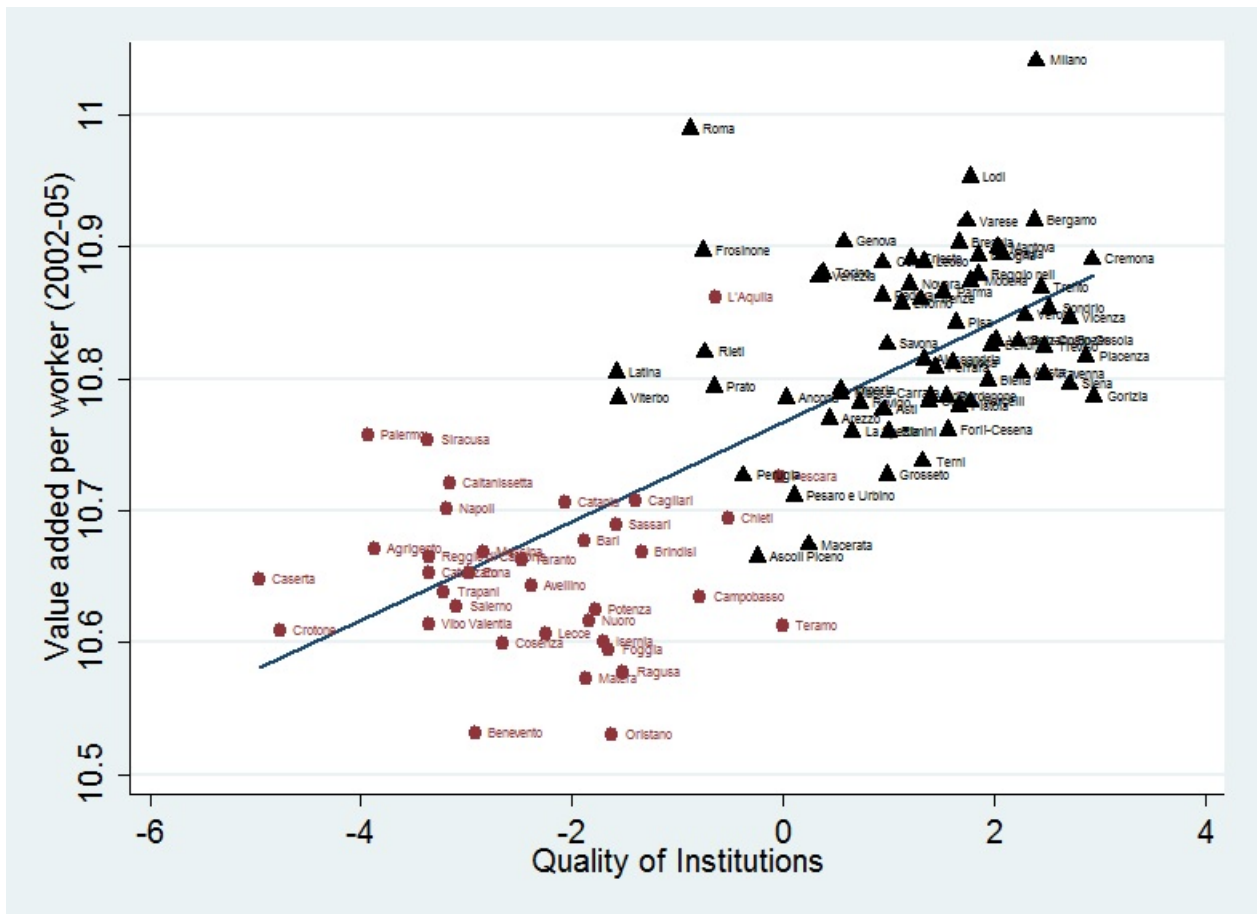


Figura 4: Productivity and quality of Institutions

Notes: Value added per worker (in euros) measured as average 2002-2005 (vertical axis) and our synthetic quality of institutions indicator (horizontal axis) calculated as the sum of four indicators on environment, energy, health and education. Red dots identify Southern provinces, black triangles identify Centre and Northern provinces. Data sources are described in Appendix A1



Figura 5: Italy during the period 1560-1659 (part A) and corresponding current provinces (part B)

Notes: Part A: Italian dominations during the period 1560-1659. Historical map from Dunan et al. (1965). In part B we identify the corresponding current Italian provinces with Spanish, Papal, Austrian, Venetian, Sabaudian domination and other Independent provinces.

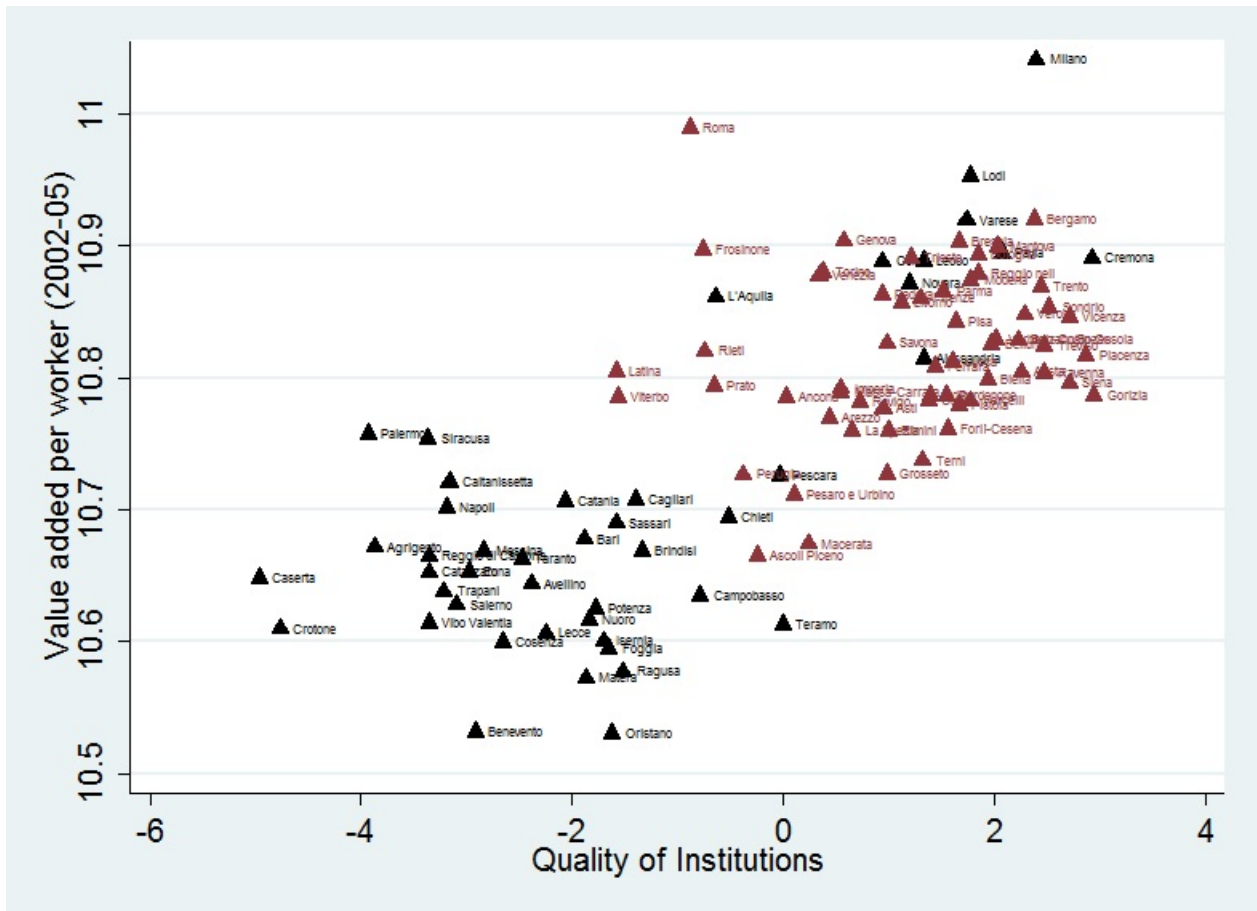


Figura 6: Former Spanish provinces

Notes: (black) dots identify Italian provinces under the Spanish control, (red) triangles identify the remaining provinces during the period 1560-1659.

C.2 Tables

Tabella 1: Value added statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Total value added per worker	103	47726	5096094	37420	62368
<i>Sectoral VA per worker:</i>					
Agriculture	103	22270	5556272	10102	40243
Industry	103	46141	6026684	33363	60763
Services	103	51689	4319835	43568	63665

Notes: Value Added measures (in euros) are average values of the 2002-2006 period. Data sources are described in Appendix A1

Tabella 2: Descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Institutional Quality (1996-2002)	103	3.93E-09	2.05254	Caserta	Gorizia
				-4.96	2.95
Extortions (1999-2002)	103	6.271384	3.679712	Treviso	Catania
				1.71	19.45
Religious weddings	103	0.801876	0.0859676	Trieste	Vibo Valentia
				0.57	0.94
Latitude (stand)	103	0.6338689	0.2716532	Ragusa	Bolzano
				0.00	1.00
Average temperature (2000-09)	103	13.46505	2.877762	Aosta	Trapani
				3.60	18.30
Average years of education (2001)	103	8.96	0.453	Caltanissetta	Rome/Trieste
				7.94	10.09
Social Capital	103	-0.0003	3.13	Vibo Valentia	Bologna
				-6.43	5.47

Notes: Average years of education (AVEDU) for each province is estimated as $AVEDU = \sum_j YR_j \cdot HK_j$, where j is the schooling level, YR_j is the number of years of schooling represented by level j , and HK_j is the fraction of the labour force for which the j th level of education represents the highest level attained. Within the Italian system, primary school lasts eight years, the secondary level is usually attained after five years, and university courses take four to six years. Social capital merges data on 1) blood donations, 2) sport participation, 3) dissemination of newspaper and 4) voter turnout. The remaining variables are the percentage values of the labor force with specific educational attainments. Data sources and methodologies are described in Appendix A1.

Tabella 3: Correlation matrix

	Institutional Quality (1996-2002)	Total Value Added per worker (2000-2009)	Average temperature (2000-2009)	Latitude	Extortions (1999-2002)	Weddings	Average years of education (2001)	Social Capital
Institutional Quality (1996-2002)	1.00							
Total Value Added per worker	0.72	1.00						
Average temperature	-0.66	-0.50	1.00					
Latitude	0.90	0.72	-0.76	1.00				
Extortions (1999-2002)	-0.58	-0.52	0.46	-0.63	1.00			
Religious weddings	-0.62	-0.59	0.37	-0.57	0.36	1.00		
Average years of education (2001)	0.76	0.81	-0.56	0.78	-0.48	-0.71	1.00	
Social Capital	0.85	0.66	-0.50	0.77	-0.54	-0.71	0.74	1.00

Tabella 4: OLS estimations

Dependent variable: value added per worker	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Institutional Quality	0.0377*** (0.004)	0.0123*** (0.005)	0.0095 (0.007)	0.0087 (0.007)	0.0142** (0.006)	0.0123*** (0.005)	0.0143** (0.006)	0.0124 (0.008)
Education (average years)		0.1514*** (0.021)	0.1466*** (0.022)	0.1481*** (0.022)	0.1542*** (0.021)	0.1518*** (0.023)	0.1529*** (0.023)	0.1506*** (0.025)
Latitude			0.0488 (0.062)	0.0213 (0.063)				0.0214 (0.064)
Temperature			0.0024 (0.003)	0.0023 (0.003)				0.0028 (0.003)
Extortions				-0.0035* (0.002)				-0.0038* (0.002)
Social Capital					-0.0019 (0.004)		-0.0021 (0.004)	-0.0037 (0.004)
Religious weddings						0.0035 (0.101)	-0.0158 (0.109)	-0.0319 (0.109)
Constant	10.7675*** (0.007)	9.4109*** (0.184)	9.3903*** (0.195)	9.4181*** (0.194)	9.3854*** (0.192)	9.4048*** (0.256)	9.4101*** (0.257)	9.4156*** (0.272)
Observations	103	103	103	103	103	103	103	103
R-squared	0.517	0.687	0.689	0.698	0.688	0.687	0.688	0.701

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. In columns (1) we show the OLS results when we introduce only our synthetic quality of institutions indicator. In columns, (3) we control for geographical features and human capital, (4) extortions, (5) social capital, (6) religious weddings, (7) social capital and religious weddings jointly and (8) all these controls jointly.

Tabella 5: IV estimations

Dependent variable: value added per worker	(1)		(2)		(3)		(4)	
	first stage	TSLS	first stage	TSLS	first stage	TSLS	first stage	TSLS
Austria	0.8021 (0.815)		0.0693 (0.640)		-0.3480 (0.501)		-0.2993 (0.509)	
Papal State	-1.2812** (0.524)		-1.0412** (0.409)		-0.4554 (0.320)		-0.4617 (0.321)	
Savoy	0.2373 (0.650)		0.5209 (0.507)		-0.1993 (0.441)		-0.1513 (0.449)	
Spain	-2.8146*** (0.390)		-1.4067*** (0.350)		-0.6919** (0.280)		-0.6827** (0.282)	
Venice	0.4613 (0.538)		0.5696 (0.418)		-0.3067 (0.336)		-0.3129 (0.337)	
Education (average years)			2.5598*** (0.319)	0.1371*** (0.033)	0.5931* (0.337)	0.1507*** (0.029)	0.6031* (0.339)	0.1537*** (0.029)
Latitude					5.5954*** (0.756)	0.0855 (0.173)	5.4273*** (0.803)	0.0686 (0.169)
Temperature					0.0227 (0.054)	0.0026 (0.003)	0.0253 (0.054)	0.0025 (0.003)
Extortions							-0.0201 (0.032)	-0.0037* (0.002)
Institutional Quality (TSLS)		0.0397*** (0.005)		0.0164* (0.009)		0.0035 (0.027)		0.0006 (0.028)
Institutional Quality (LIML) CLR (95%)		0.0398 [0.0291, 0.0509]		0.0172 [-0.0026, 0.0391]		-0.0082 (-, +-)		-0.0116 (-, +-)
Observations	103	103	103	103	103	103	103	103
R-squared	0.493	0.515	0.697	0.684	0.827	0.687	0.828	0.694
First stage F-test	18.86	7.34			1.26		1.22	
Sargan test		0.656		0.328		0.362		0.441

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Tabella 6: IV estimations - Additional controls

Dependent variable: value added per worker	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	first stage	TSLS	first stage	TSLS	first stage	TSLS	first stage	TSLS	first stage	TSLS
Austria	-0.0173 (1.176)		0.4539 (0.519)		0.0210 (0.657)		0.6158 (0.532)		-0.1399 (0.461)	
Papal State	-2.1415*** (0.757)		-0.3263 (0.344)		-0.9960** (0.430)		-0.4327 (0.353)		-0.0441 (0.294)	
Savoy	-1.4723 (0.939)		0.9513** (0.413)		0.5306 (0.510)		0.9399** (0.412)		0.0557 (0.391)	
Spain	-5.3156*** (0.563)		-0.0507 (0.339)		-1.3483*** (0.389)		-0.1701 (0.350)		0.1729 (0.293)	
Venice	-1.1089 (0.777)		0.9481*** (0.341)		0.6161 (0.441)		0.8235** (0.354)		0.1971 (0.306)	
Education (average years)			1.2399*** (0.315)	0.1366*** (0.029)	2.4858*** (0.384)	0.1364*** (0.033)	1.4079*** (0.340)	0.1395*** (0.031)	0.0100 (0.343)	0.1518*** (0.039)
Temperature										
Latitude										
Social Capital		0.0243*** (0.004)	0.3917*** (0.054)	-0.0077 (0.007)			0.4081*** (0.055)	-0.0063 (0.007)	0.2820*** (0.050)	-0.0296 (0.032)
Weddings					-0.7867 (2.251)	0.0250 (0.107)	2.3752 (1.852)	-0.0325 (0.113)	-0.6539 (1.594)	-0.0100 (0.172)
Extortions									0.0046 (0.028)	-0.0040 (0.003)
Institutional Quality (TSLS)				0.0279* (0.015)		0.0176* (0.009)		0.0237 (0.015)		0.1088 (0.116)
Institutional Quality (LIML) CLR (95%)				0.0316 [-0.0079, 0.0919]		0.0189 [-0.0030, 0.0442]		0.0276 [-0.0148, 0.0872829]		0.2014 (-, +)
Observations	103	103	103	103	103	103	103	103	103	103
R-squared	0.543	0.433	0.805	0.672	0.697	0.683	0.808	0.680	0.876	0.277
First stage F-test			3.71		6.39		3.83		0.23	
Sargan test		0.335		0.462		0.262		0.274		0.914

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Tabella 7: Descriptive statistics - Dominations

Dominator	Average length of time in power	Shortest period (years)	Longest period (years)
Normans	33	0	114
Swabians	22	0	166
Anjou	43	0	176
Spanish	125	0	411
Bourbons	20	0	66
Papal	100	0	700
Indipendent	247	0	700
Venetian	40	0	700
Austrian	34	0	437
Savoy	31	0	700

Notes: The average length of time in power refers to the average number of years, across our 103 Italian provinces, during which these dominations ruled in the Italian peninsula during 1100-1800.

Tabella 8: IV Estimations - Second Approach

Dependent variable: value added per worker	(1)		(2)		(3)		(4)	
	first stage	TLSLS	first stage	TLSLS	first stage	TLSLS	first stage	TLSLS
Normans	-0.0294** (0.013)		-0.0274** (0.013)		-0.0107 (0.011)		-0.0113 (0.011)	
Swabians	0.0058 (0.004)		0.0048 (0.004)		-0.0011 (0.003)		-0.0013 (0.003)	
Angi	0.0036 (0.004)		0.0033 (0.004)		-0.0055 (0.004)		-0.0055 (0.004)	
Spain	-0.0063*** (0.001)		-0.0047*** (0.001)		-0.0008 (0.001)		-0.0007 (0.001)	
Borbonic	0.0032 (0.016)		0.0083 (0.015)		0.0159 (0.013)		0.0163 (0.013)	
Papal state	-0.0032*** (0.001)		-0.0029*** (0.001)		-0.0013** (0.001)		-0.0012** (0.001)	
Venice	-0.0002 (0.001)		0.0002 (0.001)		-0.0012 (0.001)		-0.0012 (0.001)	
Austria	0.0021 (0.002)		0.0008 (0.001)		-0.0010 (0.001)		-0.0010 (0.001)	
Savoy	-0.0005 (0.001)		-0.0002 (0.001)		-0.0008 (0.001)		-0.0009 (0.001)	
Education (average years)			1.2429*** (0.334)	0.1310*** (0.026)	0.3706 (0.317)	0.1257*** (0.026)	0.3574 (0.319)	0.1295*** (0.025)
Temperature					5.0932*** (1.021)	-0.1367 (0.106)	5.2075*** (1.049)	-0.1376 (0.103)
Latitude					-0.0237 (0.053)	0.0018 (0.004)	-0.0267 (0.054)	0.0018 (0.003)
Extortions							0.0153 (0.030)	-0.0030 (0.002)
Institutional Quality (TLSLS)		0.0426*** (0.004)		0.0182*** (0.006)		0.0401** (0.015)		0.0358** (0.015)
Institutional Quality (LJML) CLR (95%)	0.0435 [0.0354, 0.0522]		0.0205 [0.0072, 0.0354]		0.0595 [0.0220, 0.1388]		0.0517 [0.0135, 0.1317]	
Observations	103	103	103	103	103	103	103	103
R-squared	0.770	0.508	0.800	0.682	0.859	0.626	0.860	0.649
First stage F-test	34.53		11.18		3.12		2.99	
Sargan test		0.132		0.0516		0.230		0.227

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Tabella 9: IV Estimations - Additional Controls

Dependent variable: value added per worker	(1)		(2)		(3)		(4)		(5)	
	first stage	TSLS	first stage	TSLS	first stage	TSLS	first stage	TSLS	first stage	TSLS
Normans	-0.0415* (0.022)		-0.0177 (0.012)		-0.0291** (0.012)		-0.0192* (0.011)		-0.0055 (0.010)	
Swabians	-0.0040 (0.007)		0.0062* (0.003)		0.0037 (0.004)		0.0049 (0.003)		-0.0001 (0.003)	
Angi	0.0007 (0.007)		0.0032 (0.003)		0.0018 (0.004)		0.0013 (0.003)		-0.0050 (0.003)	
Spain	-0.0087*** (0.002)		-0.0031** (0.001)		-0.0048*** (0.001)		-0.0031** (0.001)		0.0005 (0.001)	
Borbonic	0.0138 (0.027)		0.0030 (0.014)		0.0106 (0.015)		0.0057 (0.014)		0.0116 (0.012)	
Papal state	-0.0039*** (0.001)		-0.0021*** (0.001)		-0.0032*** (0.001)		-0.0023*** (0.001)		-0.0007 (0.001)	
Venice	-0.0030* (0.002)		0.0008 (0.001)		-0.0001 (0.001)		0.0005 (0.001)		-0.0005 (0.001)	
Austria	0.0030 (0.003)		0.0005 (0.001)		0.0016 (0.002)		0.0016 (0.001)		-0.0008 (0.001)	
Savoy	-0.0022 (0.002)		0.0002 (0.001)		-0.0000 (0.001)		0.0005 (0.001)		-0.0006 (0.001)	
Education (average years)			0.7954** (0.321)	0.1373*** (0.025)	1.5101*** (0.360)	0.1298*** (0.027)	1.1078*** (0.332)	0.1305*** (0.027)	0.1161 (0.332)	0.1514*** (0.032)
Temperature									0.0048 (0.048)	0.0048 (0.004)
Latitude									4.5212*** (0.978)	-0.2393* (0.139)
Social capital		0.0287*** (0.003)	0.2507*** (0.056)	-0.0075 (0.006)			0.2685*** (0.055)	-0.0091 (0.006)	0.2402*** (0.048)	-0.0205** (0.009)
Religious weddings					3.6486* (1.967)	0.0341 (0.104)	4.6977*** (1.772)	-0.0438 (0.113)	1.3925 (1.648)	-0.0177 (0.138)
Extortions									0.0247 (0.027)	-0.0039 (0.003)
Institutional Quality (TSLS)				0.0274** (0.011)		0.0198*** (0.006)		0.0301*** (0.011)		0.0751** (0.029)
Institutional Quality (LIML) CLR (95%)				0.123 [0.0466, 0.8060]		0.023 [0.0094, 0.0386]		0.0414 [0.0154, 0.0796]		0.1086 [0.0392, 0.5547]
Constant	2.6746*** (0.352)	10.7675*** (0.008)	-6.3799** (2.928)	9.5371*** (0.226)	-15.0650*** (4.152)	9.5769*** (0.279)	-12.8503*** (3.741)	9.6331*** (0.294)	-4.3180 (3.655)	9.5370*** (0.347)
Observations	103	103	103	103	103	103	103	103	103	103
R-squared	0.728	0.405	0.835	0.673	0.807	0.678	0.847	0.667	0.891	0.522
First stage F-test			1.32		11.1		5.14		1.46	
Sargan test		0.197		0.0494		0.0398		0.0536		0.687

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Tabella 10: Robustness checks

	Dep. variable: AGRICULTURE <i>Value added</i>			Dep. variable: INDUSTRY <i>Value added</i>			Dep. variable: SERVICES <i>Value added</i>		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Education (average years)		0.1218 (0.099)	0.1422 (0.091)		0.1238*** (0.040)	0.1249*** (0.039)		0.0454* (0.024)	0.0460** (0.022)
Latitude			-0.4143 (0.371)			-0.2630* (0.157)			0.0286 (0.090)
Temperature			0.0385*** (0.012)			0.0004 (0.005)			0.0028 (0.003)
Extortions			-0.0117 (0.008)			-0.0024 (0.003)			-0.0018 (0.002)
Social capital									
Religious weddings									
Institutional Quality (TSL)	0.0436*** (0.013)	0.0212 (0.025)	0.0985* (0.054)	0.0444*** (0.006)	0.0216** (0.010)	0.0548** (0.023)	0.0324*** (0.003)	0.0237*** (0.006)	0.0206 (0.013)
Institutional Quality (LIML) CLR (95%)	0.0459 [0.0201, 0.0729]	0.0294 [-0.0231, 0.0866]	0.1206 [-0.0123, 0.3418]	0.0448 [0.0335, 0.0565]	0.0222 [0.0010, 0.0442]	0.063 [0.0035, 0.1542]	0.033 [0.0265, 0.0400]	0.0251 [0.0128, 0.0390]	0.0283 [-0.0076, 0.0855]
Constant	9.9803*** (0.024)	8.8890*** (0.891)	8.5237*** (0.889)	10.7308*** (0.010)	9.6213*** (0.357)	9.7878*** (0.376)	10.8496*** (0.006)	10.4429*** (0.215)	10.3922*** (0.216)
Observations	103	103	103	103	103	103	103	103	103
R-squared	0.074	0.116	0.165	0.405	0.494	0.465	0.474	0.533	0.552
First stage F-test	0.0379	0.0276	0.678	0.427	0.284	0.708	0.296	0.360	0.368

Notes: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

D Instruments sets

D.1 Dummy approach

Tabella 11: Dominations by province

Province	Domination	Province	Domination	Province	Domination
Agrigento	SPA	Genova	IND	Potenza	SPA
Alessandria	SPA	Gorizia	AUS	Prato	IND
Ancona	PON	Grosseto	IND	Ragusa	SPA
Aosta	SAV	Imperia	IND	Ravenna	IND
Arezzo	IND	Isernia	SPA	Reggio di Calabria	SPA
Ascoli Piceno	PON	La Spezia	IND	Reggio nell'Emilia	IND
Asti	SAV	L'Aquila	SPA	Rieti	PON
Avellino	SPA	Latina	PON	Rimini	IND
Bari	SPA	Lecce	SPA	Roma	PON
Belluno	AUS	Lecco	SPA	Rovigo	VEN
Benevento	SPA	Livorno	IND	Salerno	SPA
Bergamo	VEN	Lodi	SPA	Sassari	SPA
Biella	SAV	Lucca	IND	Savona	IND
Bologna	PON	Macerata	PON	Siena	PON
Bolzano/Bozen	AUS	Mantova	VEN	Siracusa	SPA
Brescia	VEN	Massa-Carrara	IND	Sondrio	VEN
Brindisi	SPA	Matera	SPA	Taranto	SPA
Cagliari	SPA	Messina	SPA	Teramo	SPA
Caltanissetta	SPA	Milano	SPA	Terni	PON
Campobasso	SPA	Modena	IND	Torino	SAV
Caserta	SPA	Napoli	SPA	Trapani	SPA
Catania	SPA	Novara	SPA	Trento	IND
Catanzaro	SPA	Nuoro	SPA	Treviso	VEN
Chieti	SPA	Oristano	SPA	Trieste	AUS
Como	SPA	Padova	VEN	Udine	VEN
Cosenza	SPA	Palermo	SPA	Varese	SPA
Cremona	SPA	Parma	IND	Venezia	VEN
Crotone	SPA	Pavia	SPA	Verbano-Cusio-Ossola	SAV
Cuneo	SAV	Perugia	PON	Vercelli	SAV
Enna	SPA	Pesaro e Urbino	PON	Verona	VEN
Ferrara	IND	Pescara	SPA	Vibo Valentia	SPA
Firenze	IND	Piacenza	IND	Vicenza	VEN
Foggia	SPA	Pisa	IND	Viterbo	PON
Forl-Cesena	IND	Pistoia	IND		
Frosinone	PON	Pordenone	VEN		

Notes: AUS=Austria; IND=Independent; Papal state=PON; SAV=Savoy; SPA=Spain; VEN=Venetian

D.2 Matrix approach

Tabella 12: Matrix of dominations

Province	NOR	SWA	ANG	SPA	BOR	PON	VEN	AUS	SAV
Agrigento	94	72	36	411	66	0	0	14	7
Alessandria	0	0	0	171	0	0	0	0	94
Ancona	0	0	0	0	0	600	0	0	0
Aosta	0	0	0	0	0	0	0	0	700
Arezzo	0	0	0	0	0	0	0	0	0
Ascoli Piceno	0	0	0	0	0	443	0	0	0
Asti	0	0	0	0	0	0	0	0	226
Avellino	114	52	176	271	66	0	0	21	0
Bari	114	52	176	271	66	0	0	21	0
Belluno	0	0	0	0	0	0	300	0	0
Benevento	114	52	176	271	66	0	0	21	0
Bergamo	0	0	0	0	0	0	372	0	0
Biella	0	0	0	0	0	0	0	0	423
Bologna	0	0	0	0	0	294	0	0	0
Bolzano/Bozen	0	0	0	0	0	0	0	437	0
Brescia	0	0	0	0	0	0	374	0	0
Brindisi	114	52	176	271	66	0	0	21	0
Cagliari	0	0	0	389	0	0	0	7	80
Caltanissetta	94	72	36	411	66	0	0	14	7
Campobasso	114	52	176	271	66	0	0	21	0
Caserta	114	52	176	271	66	0	0	21	0
Catania	94	72	36	411	66	0	0	14	7
Catanzaro	114	52	176	271	66	0	0	21	0
Chieti	114	52	176	271	66	0	0	21	0
Como	0	150	0	173	0	0	0	87	0
Cosenza	114	52	176	271	66	0	0	21	0
Cremona	0	0	0	173	0	0	10	87	0
Crotone	114	52	176	271	66	0	0	21	0
Cuneo	0	0	114	0	0	0	0	0	418
Enna	94	72	36	411	66	0	0	14	7
Ferrara	0	0	0	0	0	202	0	0	0
Firenze	0	0	0	0	0	0	0	0	0
Foggia	114	52	176	271	66	0	0	21	0
Forl-Cesena	0	0	0	0	0	294	0	0	0
Frosinone	0	0	0	0	0	700	0	0	0
Genova	0	0	0	0	0	0	0	0	0
Gorizia	0	0	0	0	0	0	0	300	0
Grosseto	0	0	0	150	63	0	0	30	0
Imperia	0	0	0	0	0	0	0	0	0
Isernia	114	52	176	271	66	0	0	21	0

Continued on Next Page

Tabella 12 – Continued

Province	NOR	SWE	ANG	SPA	BOR	PON	VEN	AUS	SAV
La Spezia	114	52	176	271	66	0	0	21	0
L'Aquila	0	0	0	0	0	0	0	0	0
Latina	0	0	0	0	0	700	0	0	0
Lecce	114	52	176	271	66	0	0	21	0
Lecco	0	0	0	173	0	0	0	87	0
Livorno	0	0	0	0	0	0	0	0	0
Lodi	0	0	0	173	0	0	0	87	0
Lucca	0	0	0	0	0	0	0	0	0
Macerata	0	0	0	0	0	443	0	0	0
Mantova	0	0	0	0	0	0	0	93	0
Massa-Carrara	0	0	0	0	0	0	0	0	0
Matera	114	52	176	271	66	0	0	21	0
Messina	94	72	36	411	66	0	0	14	7
Milano	0	0	0	173	0	0	0	87	0
Modena	0	0	0	0	0	0	0	0	0
Napoli	114	52	176	271	66	0	0	21	0
Novara	0	0	0	173	0	0	0	25	62
Nuoro	0	0	0	389	0	0	0	7	80
Oristano	0	0	0	293	0	0	0	7	80
Padova	0	0	0	0	0	0	300	0	0
Palermo	94	72	36	411	66	0	0	14	7
Parma	0	0	0	0	5	0	0	64	0
Pavia	0	166	0	173	0	0	0	87	0
Perugia	0	0	0	0	0	430	0	0	0
Pesaro e Urbino	0	0	0	0	0	169	0	0	0
Pescara	114	52	176	271	66	0	0	21	0
Piacenza	0	0	0	0	5	0	0	64	0
Pisa	0	0	0	0	0	0	0	0	0
Pistoia	0	0	0	0	0	0	0	0	0
Pordenone	0	0	0	0	0	0	292	226	0
Potenza	114	52	176	271	66	0	0	21	0
Prato	0	0	0	0	0	0	0	0	0
Ragusa	94	72	36	411	66	0	0	14	7
Ravenna	0	0	0	0	0	291	68	0	0
Reggio di Calabria	114	52	176	271	66	0	0	21	0
Reggio nell'Emilia	0	0	0	0	0	0	0	0	0
Rieti	0	0	0	0	0	700	0	0	0
Rimini	0	0	0	0	0	294	0	0	0
Roma	0	0	0	0	0	700	0	0	0
Rovigo	0	0	0	0	0	0	300	0	0
Salerno	114	52	176	271	66	0	0	21	0
Sassari	0	0	0	389	0	0	0	7	80

Continued on Next Page

Tabella 12 – Continued

Province	NOR	SWE	ANG	SPA	BOR	PON	VEN	AUS	SAV
Savona	0	0	0	0	0	0	0	0	0
Siena	0	0	0	0	0	0	0	0	0
Siracusa	94	72	36	411	66	0	0	14	7
Sondrio	0	0	0	0	0	0	0	0	0
Taranto	114	52	176	271	66	0	0	21	0
Teramo	114	52	176	271	66	0	0	21	0
Terni	0	0	0	0	0	602	0	0	0
Torino	0	0	0	0	0	0	0	0	549
Trapani	94	72	36	411	66	0	0	14	7
Trento	0	0	0	0	0	0	0	0	0
Treviso	0	0	0	0	0	0	461	0	0
Trieste	0	0	0	0	0	0	0	418	0
Udine	0	0	0	0	0	0	380	0	0
Varese	0	0	0	173	0	0	0	87	0
Venezia	0	0	0	0	0	0	700	0	0
Verbano-Cusio-Ossola	0	166	0	173	0	0	0	87	0
Vercelli	0	0	0	0	0	0	0	0	373
Verona	0	0	0	0	0	0	300	0	0
Vibo Valentia	114	52	176	271	66	0	0	21	0
Vicenza	0	0	0	0	0	0	300	0	0
Viterbo	0	0	0	0	0	700	0	0	0

Notes: NOR=Normans; SWA=Swabians; ANG=Angi; SPA=Spain;
BOR=Borboni; PON=Papal State; VEN=Venice; AUS=Austria; SAV=Savoy