Heterogeneous Effects of Liberal Institutions on Economic Development: The Role of Cultural Coherence with Formal Institutions[1]

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Abstract

This article explores the heterogeneous effects of liberal institutions on economic performance depending on the existence of coherent cultural traits. The matching between cultural traits and institutions is what we refer to as *cultural-institutional coherence*. We study the role played by cultural-institutional coherence on the paths followed by Spanish regions after the country's liberal reforms in the 19th century. Specifically, we show that liberal reforms induced major changes in Spanish institutions and triggered a significant rearrangement in the distribution of economic development across regions, favoring those regions with cultural traits more coherent with liberal institutions. Endogeneity issues are solved resorting to the different political paths that the regions experienced in their distant past. Political paths are assessed in terms of municipal autonomy in the Middle Ages and constraints on the executive in the early modern age which, we argue, are good instruments for culture.

Keywords: Economic development, institutions, culture

JEL classification: Z13, D70, P16, O10.

"That the informal constraints are important in themselves (and not simply as appendages to formal rules) can be observed from the evidence that the same formal rules and/or constitutions imposed on different societies produce different outcomes"

(North 1990, 36)

1. Introduction

Some cultural traits have been associated with better economic, social, and political outcomes. They are supposed to foster the outcomes of liberal institutions, encouraging cooperation and participation (e.g., individual independence, self-efficacy beliefs, and generalized ethics). Other cultural traits, however, may prevent the healthy harnessing of liberal environments (e.g., amoral familism, sectarianism, excessive verticality in human relations). We coin the term *cultural-institutional coherence* to refer to this matching between cultural traits and formal institutions and use it to explain the heterogeneous effects of liberal reforms on regional economic development. In particular, we consider the case of the Spanish regions, which have shared the same formal political institutions during the last centuries but show a distinctive presence of cultural traits. Nowadays, Spanish regions that have a larger presence of cultural traits coherent with liberal institutions are also wealthier. However, this was not the case before Spain undertook a series of liberal reforms in the 19th century. We argue that these reforms triggered a significant rearrangement in the regional economic distribution, favoring those regions with higher presence of cultural traits that are coherent with liberal institutions.

Identifying a causal link from cultural traits to differential economic performance raises several empirical issues; in particular, reverse causality.[4] To address these issues, we use an instrumental variable approach, relying on Spanish history to find variables that are related to cultural traits but not directly to economic performance today and resort to two-stage least square (2SLS) estimation. Several empirical works have stressed the role of historical political experiences as key shapers of cultural traits coherent with liberal institutions (Guiso, Sapienza, and Zingales 2006, 2016; Putnam, Leonardi, and Nanetti 1993; Tabellini 2010). Following these works, we show that, prior to the country's unification, Spanish regions went through different political paths in, at least, two measurable dimensions. First, some regions experienced more municipal autonomy in the Middle Ages, which allowed them to self-govern and develop their own custom based legislation. Second, constraints on the executive in early modern age also varied across regions. Moreover, our measures of municipal autonomy in the Middle Ages and constraints on the executive in the early modern age show a high and positive correlation with current cultural traits that are coherent with liberal institutions. Thus, our empirical analysis uses these historical factors as instrumental variables for current culture traits.

The chain of events suggested here is that different regional political experiences before the unification in current Spain helped to shape different traits in local cultures. However, these cultural traits had no distinguishable effect on economic performance during the Ancient

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[4] While some empirical works suggest a causal link from culture to economic development (see, for example, Putnam, Leonardi, and Nanetti 1993; Knack and Keefer 1997; Tabellini 2010, and Guiso, Sapienza, and Zingales 2006, 2016), others stress the opposite direction, i.e., from economic development to cultural traits (see, for example, Bowles 1998; Inglehart and Baker 2000; Inglehart and Welzel 2005).

Regime. Only when Spain deepened the reforms towards a liberal state in the 19th century, these cultural traits made a difference in encouraging economic performance. Regions better endowed with cultural traits coherent with liberal institutions (in part due to their political experiences in the distant past) took greater advantage of the new economic opportunities offered by the liberal reforms.

The 2SLS estimation reveals a positive and statistically significant effect of cultural traits coherent with liberal institutions on current economic performance, measured by regional GDP per capita in 2015. The estimated coefficient is robust and stable across several alternative specifications, including controlling for historical measures of GDP per capita and literacy rates and a battery of geographic factors such as longitude, latitude, altitude, coast density and the ruggedness of the terrain.

To further explore how cultural-institutional coherence influences the regional distribution of economic performance, we also conduct a convergence analysis. The analysis reveals two key forces that drive comparative growth in GDP per capita among Spanish regions. First, there is a catch-up effect that seems to be almost always active (possibly, except in the first part of Francoist Dictatorship) by which poorer regions tend to grow faster. Second, there is a cultural effect, by which provinces with a higher presence of cultural traits coherent with liberal institutions grow faster. Before the 19th century liberal reforms and during the Francoist dictatorship, this cultural effect was annulled or attenuated. Thus, the convergence analysis also supports the hypothesis that cultural-institutional coherence is an important factor explaining the heterogenous effects of liberal reforms on economic performance.

To confirm our results, we perform a series of additional estimations and robustness checks. Many scholars have proposed different mechanisms that link the distant past with current economic and political outcomes. For the case of Spain, Oto-Peralías and Romero-Ávila (2016) show a connection between the Christian Reconquest of the Iberian Peninsula and the current distribution of economic development across Spanish regions. They suggest that the Christian Reconquest left different local systems in terms of economic and political balance of power. Those regions with more balanced distribution of power were more able to take advantage of the new technological (i.e., industrial revolution) and institutional (i.e., liberal reforms in Spain) opportunities available during the second half of the 19th century. We show, however, the existence of a cultural channel with a significant effect on economic performance even in the presence of an historical indicator for economic inequality — *Landless workers in 1797*. This, of course, does not invalidate the channel stressed by Oto-Peralías and Romero-Ávila (2016), but it suggests that cultural-institutional coherence matters, too.

Finally, we perform three additional robustness checks. First, using genetic information as proxy for colonizers' identity in the Christian Reconquest, we control for the effect of preexisting cultural patterns and governance institutions spread by the colonizers. Second, we control for the special status of the Basque Country and Navarre, which have a substantial tax autonomy. Third, we test the robustness of our results using different ways of defining municipal autonomy in the Middle Ages. In all cases, the results persist.

The rest of the paper is organized as follows. Section 2 reviews literature from institutional economics, social capital, and cultural economics to support the hypothesis that liberal

institutions have heterogeneous effects on economic performance depending on the existence of coherent cultural traits. Section 3 presents the data, including measures to trace the evolution of economic development in the Spanish regions (subsection 3.1), measures to proxy cultural variation across Spanish regions (subsection 3.2.) and the historical instruments for culture (subsection 3.3.). Section 4 discusses our identification strategy and presents the main results from the 2SLS estimation. Section 5 develops the convergence analysis. Section 6 further explores the role of cultural traits as the missing link between the distant past and current economic outcome. Section 7 performs several robustness checks. Finally, section 8 presents our concluding remarks.

2. Institutions, Cultural Coherence and Economic Performance

This section develops a simple framework to connect institutions, cultural traits, and economic performance. First, we briefly review literature from institutional economics, social capital, and cultural economics to argue that liberal institutions should produce heterogeneous effects on economic performance depending on the existence of coherent cultural traits. Second, we present simple cross-country empirical evidence aligned with this implication. Finally, we review literature from institutional economics to support the hypothesis that cultural traits have their roots in the distant past and are highly persistent.

2.1 Liberal Institutions, Cultural Traits and Economic Performance

Though liberal democracies are quite heterogeneous in many aspects, broadly speaking, all share a common corpus of liberal institutions. They are all representative democracies with open and competitive elections and mixed economies based on market mechanisms with a variable degree of public sector involvement. They allow the participation of broad sectors of the citizenry in the economic life and political decision-making. Citizens can organize themselves in companies, political parties, and other civil associations to participate in the economic, political and social realms. There is official recognition of universal and equal individual liberties and rights such as the freedom of association, the freedom of expression, universal suffrage, and the right to private property. Finally, governments are structured to encourage impersonality, rule of law, equality before the law, and transparency in their procedures.

There is no consensus on the extent to or the mechanisms through which liberal institutions affect economic performance. A common line of argument is that liberal institutions encourage economic competition, which favors the development of the most competitive products, companies and industries, as well as political competition, which favors the selection of competent policy makers and the adoption of sensible public policies for the vast majority of the population (see, for example, Acemoglu and Robinson 2012). Regardless of the exact mechanisms that connects liberal institutions with economic performance, it is clear that some cultural traits could multiply and/or ameliorate the effects of liberal institutions on economic outcomes.

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Indeed, there is an extensive literature on social capital that has explored how different cultural traits can improve or hinder the functioning of markets, private organizations, the public administration and, even liberal institutions as a whole.[5] In particular, the literature on social capital has emphasized two sets of cultural traits associated with better economic and political outcomes. First, there are cultural traits that foster active participation (e.g., tolerance towards individual autonomy, self-efficacy sense, interest in public affairs, active participation in political and social initiatives). Second, there are cultural traits that facilitate cooperation by promoting trust and the ease to solve collective action dilemmas (e.g., civism, generalized ethics, tendency to engage in voluntary associations).

These traits, however, cannot make a great difference if there is no space for participation and cooperation. In other words, an institutional framework that does not grant a space of liberties and protect individual rights (such as for instance authoritarian regimes), will not benefit much from the spread of these cultural traits.[6] Thus, liberal institutions will induce better outcomes when they are paired with coherent culture traits; which implies that liberal reforms (i.e., the adoption of more liberal institutions) will have heterogeneous effects on

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[5] For example, substantial research have documented that social capital, measured either as tendency to associate or as generalized interpersonal trust, is related to, among other things, overall economic growth (Beugelsdijk and Van Schaik 2005; Guiso, Sapienza, and Zingales 2006; Helliwell and Putnam 1995; Knack and Keefer 1997), the ease to cooperate in large organizations (La Porta et al. 1997), impersonal trade and economic specialization (Platteau 1994a, 1994b, 2000), productivity (Bjørnskov 2015), the rate of investment (Zak and Knack 2001) or the development of financial markets (Guiso, Sapienza, and Zingales 2004). Other studies have also found that social capital is associated with better performance of democratic institutions through political accountability, governmental effectiveness, legislative innovation, lower levels of corruption, greater rule of law or the overcoming of collective-action problems (Bjørnskov 2010; Boix and Posner 1998; Brown and Ashman 1996; Knack 2002; Licht, Goldschmidt, and Schwartz 2007; Nannicini et al. 2013; Putnam, Leonardi, and Nanetti 1988, 1993; Uslaner 2004).

[6] Putnam et al. (1993) argue that a greater endowment of social capital does not necessarily imply a high and sustained economic growth, but rather it makes the difference when it comes to taking advantage of the circumstances.

economic development depending on the existence of a coherent cultural system. In the following section we will show cross-country correlations aligned with this hypothesis.

2.2 Correlations between Cultural Traits and Economic Performance

It is complicated to find good empirical measurements of cultural traits for different countries. Following the empirical literature on social capital and cultural economics, we use four variables (average values for each country) from the World Values Survey (WVS):

1. *Association*[7]: Active participation in some voluntary—non-religious—organization.

2. *Trust*[8]: Generalized interpersonal trust.

3. *Interest in politics*[9]: How interested the individual is in politics.

4. *Action*[10]: Participation in alternative political actions.

The idea is that high values of these variables capture a cultural environment that favors individual independence and autonomy while individuals are still oriented to collective affairs. They are for instance more interested in political matters (***interest in politics***, ***action***),

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[7] From the question "Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization?" These variable measures the percentage of people by country who declared to be an active member of at least one non-religious organization.

[8] From the question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?", this variable expresses the proportion of people who declares that "most people can be trusted".

[9] From the question "How interested would you say you are in politics? Are you (1) very interested, (2) somewhat interested, (3) not very interested or (4) not at all interested?", this variable presents the aggregated response by country. It is inverted so that high levels imply higher interest in politics.

[10] From the question "… I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done any of these things, whether you might do it or would never under any circumstances do it". It offers: "signing a petition", "joining in boycotts", "attending peaceful demonstrations", "joining strikes" and "any other act of protest". This measure computes the percentage of people who declares to have participated at least in one of them.

are more capable to organize themselves coping with the dilemmas of collective action (***association***, ***action***) and exhibit generalized interpersonal trust within the community (***trust***).

Table 1 shows the correlation of GDP per capita with these four cultural variables for a sample of 60 countries between 2010 and 2014. The table reports these correlations for the countries grouped in different ranges of Polity2 (Marshall, Gurr, and Jaggers 2019), used here as a proxy for the depth that liberal institutions reach in each country. Polity2 is a summary index that includes measures such as the existence of open competitive elections and the level of constraints to the executive's power. It takes values between 10 and -10, with 10 being full democracy and -10 being autocracy. As we can observe, these cultural variables have a higher correlation with GDP per capita and the relation is more significant as they coexist with more liberal institutions. Additionally, Table 1 repeats the same exercise employing the V-Dem's liberal democracy index (Coppedge et al. 2019); obtaining analogous results.

A tentative interpretation of the correlations in Table 1 would be that liberal institutions are more able to seize communities' social capital to induce greater economic development, while in authoritarian regimes the relationship between social capital and economic development is nonexistent or ambiguous. One obvious problem with this interpretation is reverse causation. Liberal institutions may improve economic development and economic development may affect culture and favor the accumulation of social capital. To circumvent this problem, we will resort to a single-country case in which we will be able to assess with more clarity the chain of events: the case of the Spanish regions. For that, it will be necessary

to find an exogenous source of variation and it will be found in the regionally distinctive historical experiences that gave rise to cultural disparities across the Spanish regions.

Table 1. Correlation of GDP per capita with cultural variables across different levels of liberalization

	Correlation of per capita GDP (PPP) 2016 with			
Level of institutionalized liberal democracy	Interest in politics	Trust	Association	Action
Polity IV Project: Polity2 below 0	0.1924	0.0739	0.1136	0.0546
	(13)	(13)	(13)	(9)
Polity IV Project: Polity2 between 0 and 8	0.1162	0.4585**	0.0942	0.4800**
	(21)	(21)	(21)	(21)
Polity IV Project: Polity2 above 8	0.6839***	0.7113***	0.3056**	0.6028***
	(19)	(19)	(19)	(19)
V-Dem: Liberal democracy below 0.25	0.350	0.0068	-0.0872	-0.2927
	(18)	(18)	(18)	(15)
V-Dem: Liberal democracy between 0.25 and 0.60	-0.1300	0.5767**	-0.0341	0.2412
	(17)	(17)	(17)	(16)
V-Dem: Liberal democracy above 0.60	0.8343***	0.7541***	0.5595***	0.6523***
	(20)	(20)	(20)	(20)

Notes: *Significant at 10%; **Significant at 5%; ***Significant at 1%. Number of observations in parentheses. GDP per capita is obtained from the World Bank database. The World Bank does not provide per capita GDP data for the countries Azerbaijan, Kuwait, Libya, Palestine and Taiwan. Besides, in some countries (Qatar, Belarus, Uzbekistan and Singapore), the question regarding participation in unconventional political actions is not asked since the right to protest is not fully recognized. Two indicators are used to compare different levels of liberal institutions: Polity2 from Polity IV Project and Liberal Democracy Index from V-Dem (sources in the main text).

2.3. Historical Roots and Persistence of Cultural Traits

If cultural traits quickly adapted to current institutions, there would be no point in considering an independent role of cultural traits on economic performance. In recent decades, however, several empirical studies have shown that cultural traits are highly persistent and may find their roots in a distant past. For example, Nunn and Wantchekon (2011) found evidence that contemporary trust in African regions is associated to past slave trade. Voigtländer and Voth (2012) showed that regional patterns of anti-Semitism in early

20th century Germany can be predicted by anti-Semitism back in the Middle Ages. Alesina et al. (2013) found that past agricultural practices, especially related to the use of the traditional plough, affected the historical gender division of roles and the evolution of gender roles and norms in Africa. Peisakhin (2015) described how current Ukraine's political attitudes and behavior are geographically divided by the ancient border between the Austrian and the Russian empires. Grosfeld and Zhuravskaya (2015) explored the persistent effects of the historical Poland partitions, finding solid cultural consequences. Bukowski (2019) showed how the effect of the educational system in 19th century Austrian Partition in Poland persisted through social norms, thereby affecting current academic performance.

Of particular interest for this paper are the empirical studies that explore the connections between political experiences in the distant past and current cultural traits. Tabellini (2010) shows how more inclusive historical state-level institutions, proxied by constraints on the executive, allowed the development of cultural traits that positively influence current economic performance. Giuliano and Nunn (2013) find evidence that historical democratic experiences at the local level are associated with the contemporary development of a democratic system at the national level, positive attitudes towards democracy and better economic and political performance. Becker et al. (2016) investigate the long-term legacy of the "well-respected" administration of the Habsburg empire in contemporary quality of public administration and citizens' trust in local public entities. Regarding the role of historical local political institutions in shaping cultural traits, the case of Italy has been paradigmatic. Putnam et al. (1993) and Guiso et al. (2016) demonstrated that self-governed city-state medieval experiences in northern Italy promoted the development of the civic

community, showing higher levels of civism, generalized trust and cooperation. Beyond ethics and cooperative traits, Guiso et al. (2016) emphasized the role of self-government experiences in fostering self-efficacy beliefs, "the belief in one's ability to complete tasks and reach goals", which are positively associated with cooperative spirit.

Summing up, two important ideas emerge from the current empirical literature on the historical development of cultural traits. First, cultural traits can be highly persistent over long periods of time. Second, in many cases it is possible to trace back the origin of current differentials in cultural traits to diverse historical experiences in the distant past.

3. Data

This section presents our data and shows basic descriptive statistics. Our main variables are the series of GDP per capita for the Spanish regions, a cultural index for the Spanish regions and two historical variables that will be used to instrument culture: municipal autonomy in the Middle Ages and constraints on the executive in 1600-1800.

3.1. Distribution of Economic Performance in the Spanish Regions

Figure 1 depicts indexed GDP per capita for the Spanish provinces for four selected years: 1800 in Figure1.a, 1860 in Figure1.b, 1935 in Figure1.c, and 2015 in Figure1.d. Note that in 2015, the highest levels of per capita GDP are geographically concentrated in the northeastern quarter of Spain. This geographical distribution of rich and poor regions has

been persistent from the beginning of the 20th century. For example, the correlation between provincial GDP per capita in 1935 and 2015 is 0.79. Between these two years, remarkable historical events happened: the end of the Second Republic, three years of civil war, forty years of Franco's dictatorship, the transition to democracy, more than 40 years of decentralization into autonomous communities, Spain joining the European Single Market, and the adoption of the common European currency Euro. None of these events, however, seem to have significantly affected the regional distribution of GDP per capita among Spanish provinces. The nineteenth century, however, started with a very different distribution (Figure 1.a). For example, Extremadura and Andalusia were among the richest regions and Basque Country, La Rioja and Aragon were below the average[11] (Carreras, Prados de la Escosura, and Rosés 2005). In the early twentieth century, these positions had been inverted and remained until nowadays.

These regional reversal of fortunes[12] in the nineteenth century and the subsequent stability in the regional distribution of GDP per capita from the 1930s can be better appreciated in Figure 2, which depicts the evolution of GDP per capita of the autonomous communities from 1800 to 2000. Figure 2.a depicts autonomous communities whose GDP per capita was above the Spanish GDP per capita (indexed to 100) in the 1930s, while Figure 2.b depicts the evolution of those autonomous communities whose GDP per capita was below 100 in the 1930s. Only two small autonomous communities (Cantabria and Asturias) crossed the Spanish line from 1930 (not shown in the graphs). We can observe a rearrangement in the

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[11] Appendix 1 shows two maps with the names of the Spanish autonomous communities and provinces.
[12] We call it *reversal of fortunes* because the previous economic regional distribution was stable during centuries before the transformations of the nineteenth century (see Appendix 3).

regional economic distribution during the nineteenth century that conclude in the 1930s, and,

thereafter, the distribution remains fairly stable.
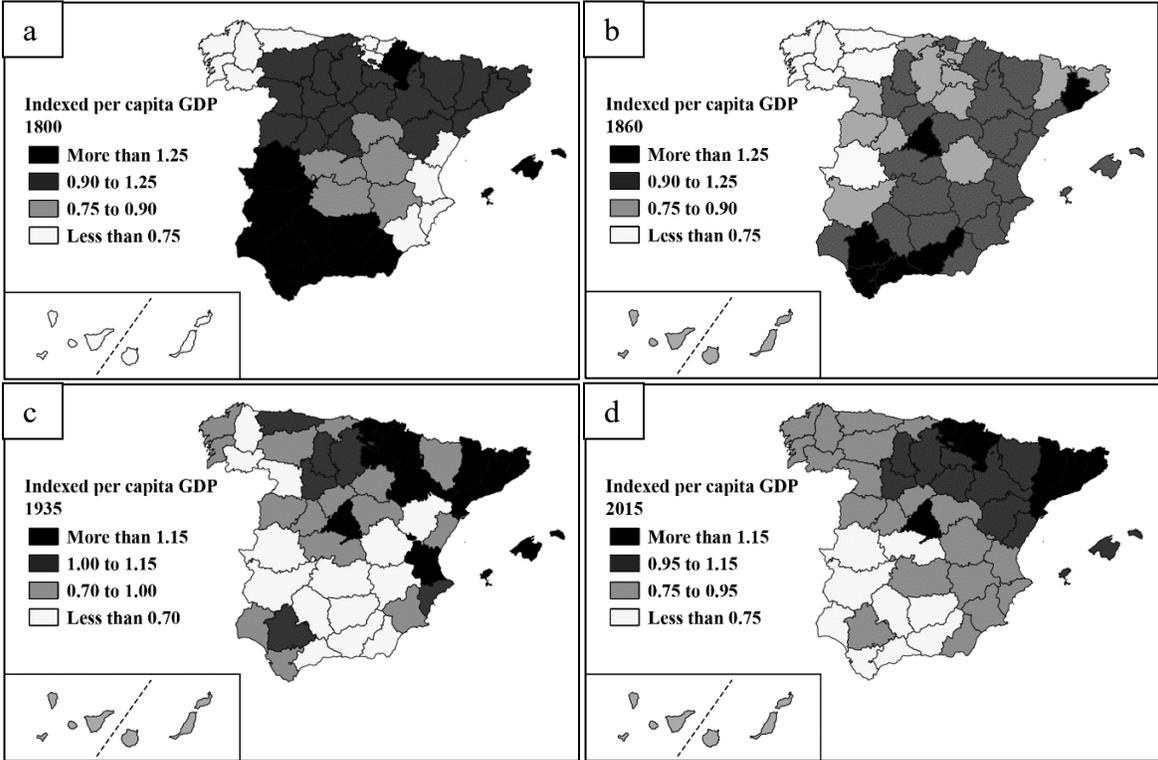
Figure 1. Indexed GDP per capita Spanish autonomous communities (selected years)
Notes: Own elaboration with data from Carreras et al. (2005), for 1800, and Díez-Minguela et al. (2018), for the rest. Data are indexed (Spain=1) and aggregated at autonomous community level.
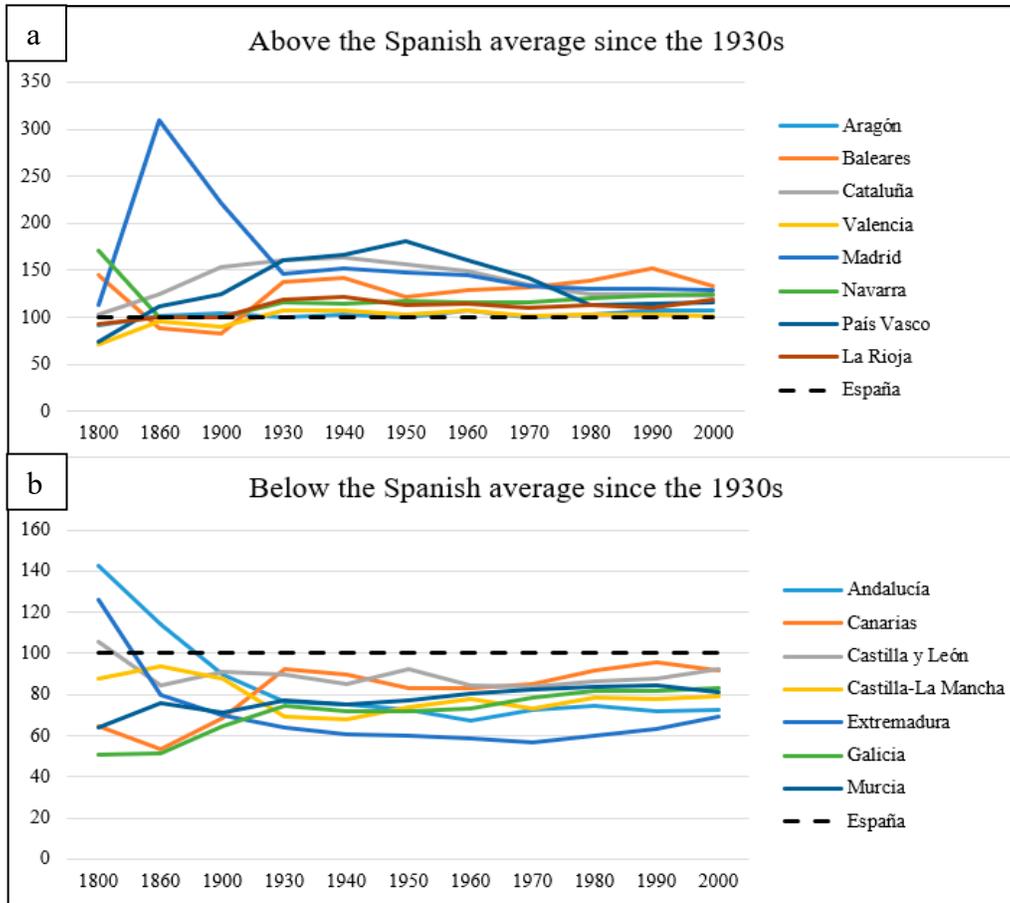
Figure 2. Indexed GDP per capita in Spanish autonomous communities 1800-2000 (Spain=100)
Notes: Own elaboration from data contained in Carreras et al. (2005). Data are indexed (Spain=100)

3.2. Distribution of Cultural Traits in the Spanish Regions

Between 2015 and 2019 the Spanish Center of Sociological Research (CIS) conducted several individual surveys across Spain, which include several cultural-related questions, similar to those employed in cross-countries studies (see Section 2.2). From these surveys, we use four variables: interest in politics[13], level of generalized interpersonal trust[14],

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[13] From CIS (2015, 2016c, 2019a, 2019b). The four surveys ask the same question: "Generally speaking, would you say that you are interested in politics a lot, considerably, a little or nothing at all?" To build this indicator, the options are valued in a range from 1 to 4, with 1 being "nothing at all" and 4 "a lot". We take the provincial average of the individuals' answers. The indicator corresponds to the mean of those four waves.

[14] From CIS (2016a, 2016b). We use the typical question "Generally speaking, would you say that most people can be trusted or that you can never be too careful in dealing with people?". It offers 10 options from 1 to 10,

tendency to participate in voluntary civil organizations [15], and habit of engaging in unconventional political actions[16]. The idea is that higher values of these variables capture a greater presence of cultural traits coherent with liberal institutions. From the first principal component of these four variables, we build a summary index denoted *Culture*. This index is meant to be a proxy for the provincial variation of the presence of cultural traits coherent with liberal institutions. However, the sample design of some of these surveys only allows us to obtain subnational aggregations at the autonomous community level and not at the provincial level[17], which is our spatial unit of analysis. Specifically, while interest in politics can be aggregated at provincial level, the other three variables must be aggregated at autonomous community level[18]. This construction (i.e., mixing aggregates at provincial and

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with 1 being "You can never be too careful" and 10 "Most people can be trusted". This indicator shows the average score in the autonomous communities. The sample of this survey is small and is not designed to get provincial aggregates, so this indicator shows the average score in the autonomous communities, and then it is imputed to their provinces. In fact, when pooling both surveys. small autonomous communities like La Rioja or Navarra get only 86 and 185 observations respectively, but this is the best we can do.

[15] From CIS' (2016a, 2016b, 2019c) question: "… can you tell me about each of these organizations, whether you belong, whether you have ever belonged or whether you never belonged to...?" And it offers a list of organizations. The indicator reflects the percentage of people in the autonomous community that at least belong to one organization. As in the previous case, the value of each autonomous community is imputed to their provinces.

[16] From CIS (2016a, 2016b, 2019c). The three surveys ask the same question: "I would like you to tell me whether you have carried out on many occasions, sometime or never the following actions that people may pursue in order to make known their opinion about an issue". However, because surveys do not present the same options, we take into account only those actions that appear in the three surveys: "participating in a demonstration," "buying or refusing to buy a product for ethical reasons or to protect the environment," "participating in a strike", "occupying buildings, participating in a lock-down or blocking the traffic" and "participating in a political forum or discussion group on the internet". The question scores as 2 "many occasions", as 1 "sometime" and as 0 "never". A single variable is created by obtaining the principal component of the scores for these five alternative political actions and the final indicator shows the mean of the three surveys for the autonomous communities. Finally, the values are imputed to the provinces.

[17] Autonomous communities are administrative and political entities of a higher hierarchical level. Most autonomous communities comprise more than one province (see Appendix 1).

[18] The value obtained for the autonomous community had been imputed to its province(s).

autonomous community levels) works under the assumption that the variables share some consubstantiality and provincial variability within the autonomous communities is similar.

Figure 3 depicts the geographical distribution of the variable ***Culture*** in the Spanish territory. Note that the highest levels are concentrated in the northeastern part of the country.
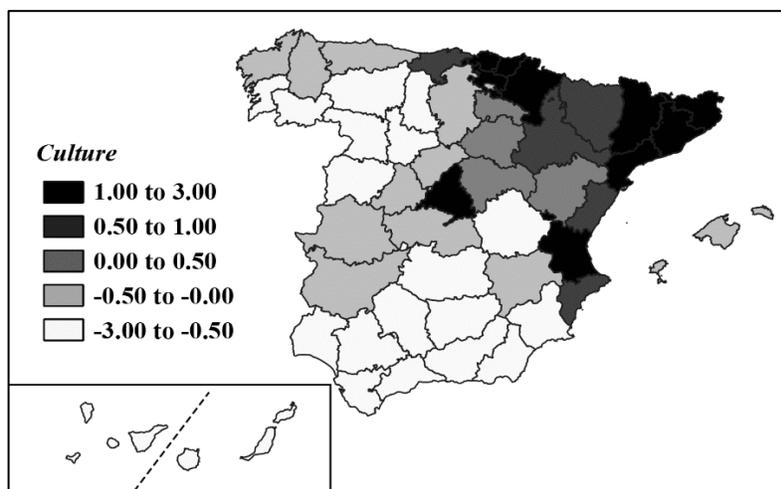
Figure 3. Geographical distribution of the variable Culture
Notes: Own elaboration from CIS data.

3.3. The Long Shadow of History: Political Experiences in Spanish Regions

We employ several sources (mainly Barrero and Alonso 1989, Martínez Díez 1983, and Tabellini 2010) to build two historical variables that will be used to instrument culture: municipal autonomy in the Middle Ages and constraints on the executive in 1600-1800. The intuition is that provinces with more municipal autonomy to self-govern and with more constraints on the executive developed cultural traits comparatively more coherent with liberal institutions and in a substantial extent these differences persisted over centuries. Thus,

the current regional variation of these cultural traits has a component originated in the different political experiences of the regions in their historical trajectories.

Figure 4 depicts the locations with high levels of municipal autonomy in the Middle Ages (see Section 3.1.1 for details) and our variable *Municipal autonomy in the Middle Ages*, which takes the value one in the provinces in which a system of municipal autonomy was prevalent (the shaded area in the map). Note that municipal autonomy was more prevalent in the northeastern part of the Iberian Peninsula.
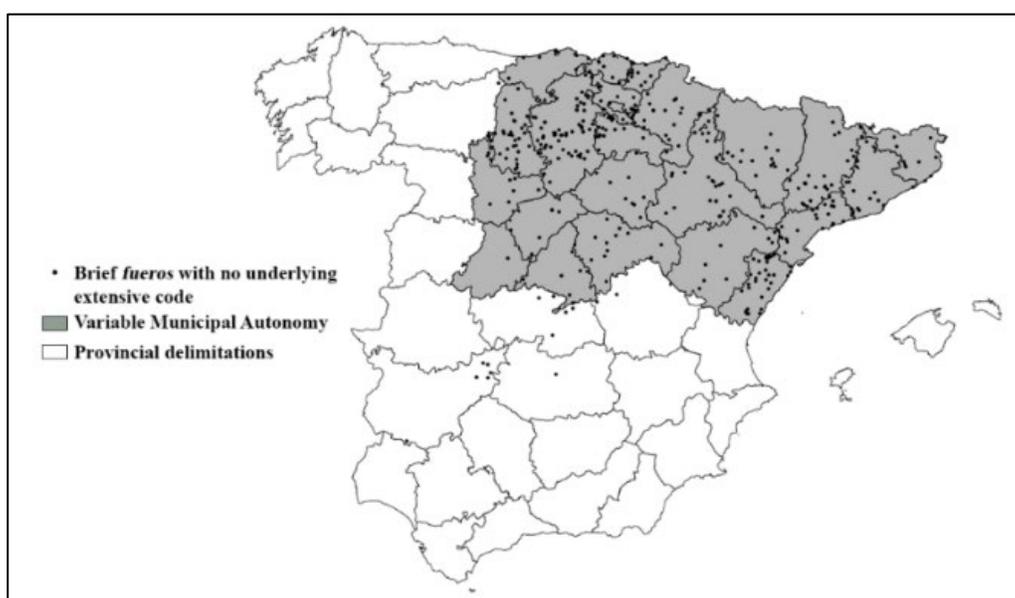
Figure 4. Geographical distribution of Municipal autonomy in the Middle Ages
Notes: The dots show the locations that were granted fueros breves in the first place before kingdom-wide extensive legal codes were enacted: *Ordenamientos de Alcalá* in the Crown of Castile (1348), *Privilegio General de Aragón* in the Kingdom of Aragon (1283), *Fuero General de Navarra* in Navarre (1238), *Furs de Valencia* (1261) in the Kingdom of Valencia, *Usatges de Barcelona* (1251) in the Principality of Catalonia and *Carta de Franquesa de Mallorca* (1230) in the Kingdom of Majorca. The brief fueros granted by military orders have been also kept aside.

Figure 5 shows the distribution of *Constraints on the executive in 1600-1800* for the Spanish provinces. The variable uses Tabellini's indicator for constraints on the executive (see Tabelini 2010), but we also introduce some modifications (see Section 3.1.2 for details).

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Note that this variable also adopts higher values for the northeastern part of the Iberian Peninsula.

3.3.1. Municipal Autonomy in the Middle Ages

The long process of the Christian Reconquest in the Iberian Peninsula (8th–15th centuries) brought about a period in which the municipality was the key political unit. The Muslin invasion disarticulated the Visigothic Regime (5th-8th centuries) and the Christian elites that took shelter in the northern regions attempted to re-extend their domains towards the south for centuries. The varying conditions in the different stages of the process in terms of power balance among actors and warfare needs gave rise to a wide range of political and legal arrangements at the local level across Medieval Spain.
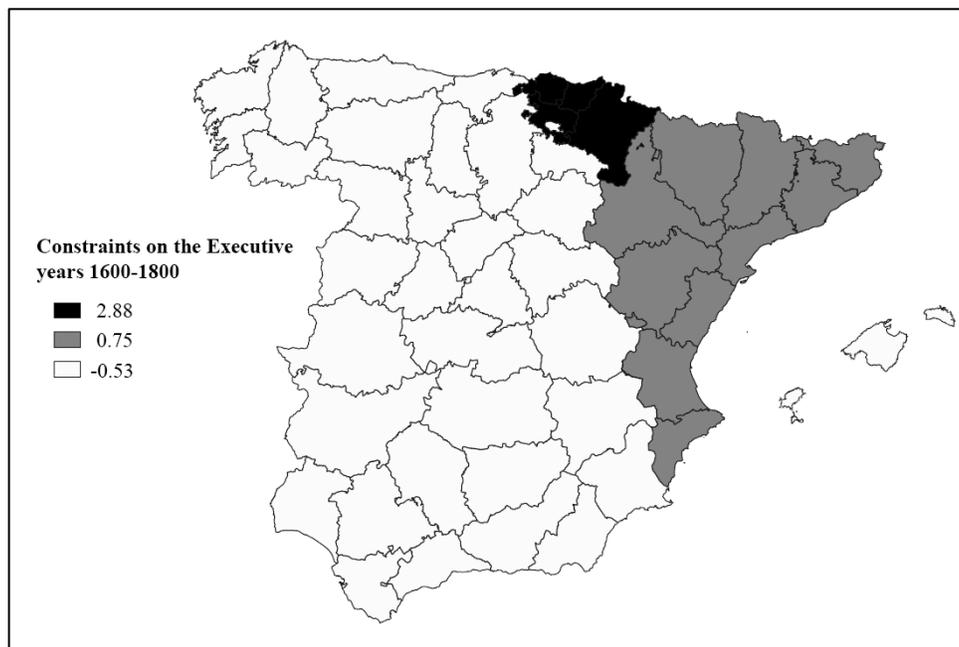

Figure 5. Geographical Distribution of Constraints on the Executive in 1600-1800
Note: Own elaboration using Tabellini (2010).

Some geographical patterns have been often pointed out regarding the degree of inclusiveness in the different municipal social orders that were emerging during the Reconquest (Orduña 2003). We know about the sharp contrast between the early, more inclusive central and northeastern municipalities and the southern local systems with highly concentrated land property and political power. However, it is a hard challenge to measure with certainty the degree of the differences among regions or even localize with precision the geographical delimitations of different local orders. We employ the history of Spanish medieval legislation as a reference to uncover these different patterns of municipal inclusiveness across regions.

Before the entry into force of kingdom-wide legislations in the 13th and 14th centuries, the Iberian Peninsula was covered by an enormous and heterogeneous amount of local legislative texts. These texts were of different kinds and had different names, but for simplicity we will use the most known designation: the *fuero*[19]. Fueros were legal texts of variable length that took the shape of local constitutions or private law codes that were granted by royal, noble, and clerical elites or developed by the local councils. They could contain privileges (e.g., tax exemptions) and private law dispositions (e.g., tort, inheritance) and establish certain social and political structure (e.g., class-based rights and duties, local elites' and officials' election procedures).

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[19]The word *'fuero'* comes from the Latin voice *forum* and originally meant "the way in which the court must act" (García-Gallo 1956). With this name we also refer here to other local medieval legal texts were *cartas pueblas*, *privilegios*, *customs*, *franquesas*, *consuetudines*, and *furs*.

The first fueros that we know of appeared in the 9th century. In the first stages of the Christian Reconquest, the towns that were founded or repopulated were endowed with small fueros, in which a set of rights and freedoms were granted to the inhabitants. They were intended to make the new reconquered areas more attractive for new settlers and consolidate positions in the Christian advance towards the south. These first fueros were very limited and are called *fueros breves* (brief fueros). Since they were insufficient to cover all the normative necessities that the daily life required, they had to be backed by another complementary legal code or be locally completed with accordance to customary norms. As the Reconquest was advancing to the south, the so-called *fueros extensos* (extensive fueros) became more and more common. Gradually, the elites of the kingdoms stablished more complete legal orders (of their convenience) and, from a certain point on, large codes were imposed with territorial scope either as complementary texts or definitively displacing the local codes.

Before the eventual imposition of these large codes of territorial scope, extensive areas of the northern Iberian Peninsula were only granted with *fueros breves* and were thus in need of completing their own local law either by the participation of an important proportion of the population, the use of political delegates or through the judicial creation of law. However, this local autonomous completion of the law mainly occurred in the northcentral and northeastern part of the Iberian Peninsula, since the elites of the western kingdoms (which we will identify as Kingdom of Leon) opted to officially complement the local orders with the ancient Visigothic law (*Liber Iudiciorum*) as an underlying legal corpus. This reveals the attitude of the Leonese royal elites toward local autonomy and could explain why the

experiences of self-governance that were prevalent in the northcentral and northeastern part of the Iberian Peninsula were not common in the northeast[20].

In order to build a variable that captures the presence of municipal autonomy in the Middle Ages for each Spanish province, we rely on the catalog of fueros elaborated by Barrero and Alonso (1989). Each dot in Figure 4 indicates a location that was granted a *fuero breve* in the first place, without any supplementary extensive fuero before the enactment of extensive kingdom-wide legal codes. This map allows us to delimit geographically the extension of this kind of local orders. We create a dummy variable called ***Municipal autonomy in the Middle Ages*** that takes the value 1 in the provinces in which these systems were prevalent (shown in the map as the shaded area)[21,22]. The intuition is that those places with municipal autonomy to develop their own custom based legislation could enjoy a more inclusive

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[20] In the literature of Spanish medieval history of law, we usually find references to these differences between northwestern systems and the rest of the northern Peninsula. For example, according to García-Gallo, "in stark contrast to the Visigothic system, centered on the validity of *Liber Iudiciorum*, we find what we could characterize as free law; that is, an always-in-progress legal order, within which the norms to be applied are freely sought for each case, and for any dispute judges judge freely according to their 'free will' " (García-Gallo 1979, 377). In these comparatively more autonomous systems, local laws were created or formalized considering the interest of the citizens and, except in rare cases, "it was never a capricious and arbitrary decision by the judge, since the people would have never accepted such a regime" (García-Gallo 1979, 369). With regard to the expansion of the judicial creation of law, "it had deep roots in Castile, Navarra and Aragon" (Gacto, Alejandre, and García 2009, 121–22). In these regions as well as in the Basque Provinces (Gacto, Alejandre, and García 2009, 204) and Catalonia (Font Rius 1983; García-Gallo 1979, 445) custom based legislation was also developed by local political actors.

[21] Still some brief fueros appear below the shaded area. There were three fueros granted by Alfonso VII; after his reign the policy of extensive fueros was going to be prevalent. The remaining were stablished by different elites from Toledo to small villages. The rest of southern Spain was replete with extensive fueros.

[22] The case of the province of *Castellón* is special. This province was rapidly reconquered and granted with many local fueros but immediately the king enacted in the whole region (Kingdom of Valencia) a kingdom-wide extensive code denoted *Furs de Valencia*. Only 25 years passed from the establishment of the first local *fuero* to the enactment of the *Furs*. Besides, it is not clear whether these specific fueros were brief or extensive (Romeu Alfaro 1972). However, these municipalities were granted to keep their special regime, based in Aragon legal tradition after the enactment of the *Furs de Valencia*. That is why we decided to include this province in the shaded area. It barely affects the results in the empirical analysis, as can be seen in the robustness check in section 7.3.

municipal order. However, although autonomy certainly was a *sine qua non* condition to maintain inclusive institutions in the period from the 9th to the 13th century, it does not mean that municipal autonomy necessarily led to political inclusiveness. The grounding about the comparative inclusiveness in these areas is provided by historians. Thus, based on the available historical evidence, we approximate the geographical demarcation of these relatively inclusive areas with municipal autonomy. As we can observe in Figure 4, the western border was the Kingdom of Leon and the southern border the so-called Communities of Town and Land (*Comunidades de Villa y Tierra*) (as defined geographically by Martínez Díez, 1983)[23].

3.3.2. Constraints on the Executive in 1600-1800

The disparities among the regional political systems that coexisted within early modern Spain are broadly known, although they remain a bone of contention and are difficult to measure. During this period, the same monarch held control over all modern Spain; however, the kingdoms were separate regimes, with different political institutions, bodies, and traditions. As in the case of municipal autonomy, it is complicated to develop a comparative measure of the level of inclusiveness of these political systems. One alternative is to rely on the levels of constitutional and parliamentary constraints on the executive.

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[23] Appendix 4.1 provides more details on the building of this measure and argues why we have not opted to use alternative indicators other than the simple presence of brief fueros in the province, such as the count of fueros per province or the density of cases per square kilometer.

Tabellini (2010) made an institutional assessment of the constraints on the executive and provided a comparative measure for the political regimes across regions in Spain and four other European countries (Belgium, France, Italy, and United Kingdom). This measure follows the Polity IV methodology, assigning values from 1 to 7, with 1 being "unlimited authority" and 7 being "accountable executive, constrained by checks and balances". We use Tabellini's indicator as the base for our variable ***Constraints on the Executive in 1600-1800***, but we also introduce some modifications to account for some absent regional specificities (see Appendix 4.2. for details).

The resulting measure is shown in Figure 5. ***Constraints on the executive in 1600-1800*** takes value of 2.88 for Basque Country and Navarre, 0.75 for Aragon, Catalonia and Valencian Community and -0.53 for the rest. The Crown of Castile, excepting Basque Country and Navarre, gets the lowest value due to the weakness of the Courts of Castile before the power of the Monarch. The kingdoms of the Crown of Aragon (excepting Kingdom of Mallorca), i.e. Kingdom of Aragon, Kingdom of Valencia and Principality of Catalonia, had more solid parliaments and constitutions-like documents that had to be sworn by the Monarch. The same happened with Navarre and Basque Country, which achieve the highest value because their *foral* regime lasted longer than Crown of Aragon's institutions. The special regime of the kingdoms of the Crown of Aragon ended with the Nueva Planta Decrees in 1707-1716, in virtue of which they were integrated under the Castilian political regime.

4. Identification Strategy and Main Empirical Results

This section explores the causal effect of cultural traits on economic performance within liberal institutions, or, similarly, the heterogeneous effects of liberal institutions on economic development depending on the existence of coherent cultural traits.

4.1. Correlations, Endogeneity, and the Identification Strategy

The chain of events suggested by sections 2 and 3 is as follows. Inclusive historical experiences in the political trajectories of some regions (described in Section 3.3) before the unification in current Spain helped to develop cultural traits more coherent with liberal institutions (described in Section 3.2) with long-lasting consequences. However, only when Spain deepened the adoption of liberal institutions this cultural traits made the difference in fostering economic development (described in section 3.1). This chain of events is indicated by the red arrows in Figure 6 and is backed by the high correlations shown in Table 2[24]. Specifically, we can see a high and significant linear correlation between *Culture* [2] and *GDP per capita in 2015* [1]. All the cultural variables considered individually [5-8] are also substantially correlated with *GDP per capita in 2015*. The historical variables, *Municipal Autonomy in the Middle Ages* and *Constraints on the Executive in 1600-1800*, are also highly correlated to both *GDP per capita in 2015* and *Culture*.

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[24] The variables used in this Section 4 are described in Appendix 2.
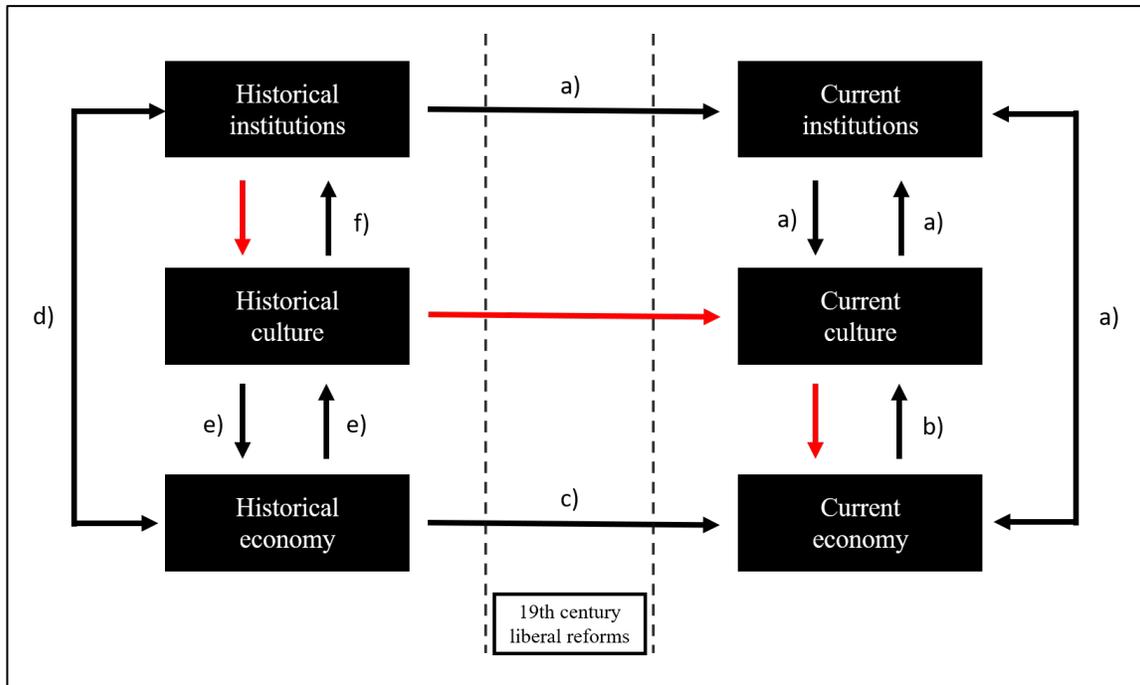
Figure 6. Causal chart

However, as shown in in Figure 6, there may exist a triple feedback relationship among institutions, culture, and economic performance. Thus, , we need to ensure that our results are not the outcome of the effects arising from any of the black arrows shown in Figure 6. Next, we address all of them.

In Figure 6, the difference between historical and current factors is marked by the 19th century liberal reforms. These liberal reforms are a key event because they opened the door for cultural traits coherent with liberal institutions to produce a differential effect on economic performance. The process by which Spain adopted liberal institutions had advances and setbacks. The main institutional reforms from the Ancient Regime occurred during the end of the 18th century and first half of the 19th century. They involved, among other things, the abolishment of the seigneurial jurisdictions, the confiscation of land

(*desamortización*) from the "mortmains"[25], and the removal of internal restrictions on trade

and the promotion of market integration. According to Carreras and Tafunell (2003), in the

economic sphere, it is reasonable to consider that *Liberal Spain* was born between 1833 and

1839.

Table 2. Correlation matrix among GDP per capita, historical institutions and the cultural variables

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[1]	*GDP per capita in 2015*	1							
[2]	*Culture*	0.776**	1						
[3]	*Mun. autonomy in Mid. Ages*	0.759**	0.676**	1					
[4]	*Constr. on the Ex. 1600-1800*	0.722**	0.708**	0.499**	1				
[5]	*Interest in politics*	0.527**	0.734**	0.559**	0.323*	1			
[6]	*Alternative political actions*	0.765**	0.877**	0.550**	0.692**	0.588**	1		
[7]	*Trust*	0.488**	0.718**	0.461**	0.581**	0.283*	0.544**	1	
[8]	*Participation in associations*	0.611**	0.777**	0.537**	0.590**	0.423**	0.553**	0.437**	1

Notes: *Significant at 5%; **Significant at 1%.

Nowadays all the Spanish regions share the same liberal institutional environment. The

regions, however, had different political trajectories until their unification in current Spain.

Thus, the unification of Spain is key because it marks the end of regionally differentiated

formal political institutions or, at the very least, it implies a significant reduction in its

dispersion[26]. All the arrows marked with a) in Figure 6 are channels that are ruled out due to

this fact.

The main concern with reverse causation is the feedback between current culture and current

economic development. This is meant to be solved by using historical institutions as

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[25] The Spanish confiscation involved the seizure of land from the hands of the Catholic Church and the municipalities and its subsequent sale on the market or in public auctions.
[26] The unification of Spain was a complex historical process with several stages that lasted centuries. The final stage began with the *Nueva Planta* Decrees (1707-16) by which the eastern kingdoms become integrated into the institutions of Castile and ended with the abolishment of Basque and Navarre fueros around mid-1800s.

instrumental variables. In this way, we are using the component of culture that is due to historical experiences and is exogenous to contemporary economic prosperity. Exploiting this exogenous variation, we can assess the impact of regional cultures in economic performance. This is how we address arrow b).

Table 3. Correlation matrix adding historical GDP per capita and historical culture

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
[1]	*GDP per capita in 2015*	1						
[2]	*Culture*	0.776**	1					
[3]	*Mun. autonomy in Mid. Ages*	0.759**	0.676**	1				
[4]	*Constr. on the Ex. in 1600-1800*	0.722**	0.708**	0.499**	1			
[5]	*GDP per capita in 1800*	-0.175	-0.016	-0.010	-0.108	1		
[6]	*GDP per capita in 1860*	0.038	0.171	0.112	0.033	0.513**	1	
[7]	*Culture_hat*	0.853**	0.800**	0.845**	0.885**	-0.072	0.080	1

Notes: *Significant at 5%; **Significant at 1%.

Another concern would be that the current regional economic distribution mirrors the preexisting historical economic distribution. However, as we discussed in section 3.1 and we can also observe in Table 3, there is no correlation between 2015 and 1800 (column 1, row 6) nor 1860 (column 1, row 7) regional economic distributions. Therefore, channel c) is also ruled out. The historical economic distribution is also uncorrelated with our two instrumental variables (column 2 and 3 with rows 5 and 6 in Table 3), so channel d) is unlikely[27].

Culture_hat is the prediction of *Culture* from an OLS regression on the instrumental variables. It represents the historical component of the regional variation in cultural traits.

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[27] This has also been tested with Bairoch's (1988) regional urbanization rate and these institutions are mostly uncorrelated with all the available distributions from the year 800 to 1850. And when they are significantly correlated the relationship is negative.

The correlation between **_Culture_hat_** and historical economic development (columns 5 and 6 with row 7 in Table 3) is insignificant. Therefore, channel e) is also neglectable.

Regarding the feedback between historical institutions and historical culture (arrow f), its existence is widely recognized in the institutional literature (see, for example, North 1990, 2005; Roland 2004). However, this is not an empirical concern because our aim is not assessing the impact of institutions on culture; thus, we simply need an exogenous source of variation to use as an instrumental variable for culture. Nevertheless, as we will see in section 7.1, it is reasonable to state the institutional origin of the regional variation in cultural traits. Specifically, the Christian Reconquest stablished the original institutions regardless of the culture of the colonizers and set the seed for the differential political trajectories.

Finally, for the regressions in the next subsection, we perform the overidentification test to assess if there is any other omitted channel.

4.2. Two-Stage Least Square (2SLS) Estimation

We estimate the following regression model:

$$Y_i = \alpha + \beta C_i + \delta X_i + \varepsilon_i \tag{1}$$
$$C_i = \tau + \pi IV1_i + \psi IV2_i + \varphi X_i + \omega_i \tag{2}$$

where Y_i is the GDP per capita of province i in 2015; C_i is the Culture of province i; X_i are control variables; and $IV1_i$ and $IV2_i$ are the historical variables **_Municipal Autonomy in the Middle Ages_** and **_Constraints on the Executive in 1600-1800_**.

Table 4 shows the results of 2SLS estimations. For each column, panel A shows the second stage of the 2SLS estimation, while panel B shows the corresponding first stage estimation. Column (1) presents the result of regressing *GDP per capita in 2015* only on *Culture*, with the latter being instrumented by *Municipal autonomy in the Middle Ages* and *Constraints on the executive in 1600-1800*. The first stage (column 1, panel B) confirms that *Municipal autonomy in the Middle Ages* and *Constraints on the executive in 1600-1800* have a statistically significant impact on *Culture*. The second stage (column 1, panel A) confirms the positive effect of *Culture* on *GDP per capita in 2015* once only the exogenous component of *Culture* is considered.

Columns (2)-(5) control for alternative determinants of both *Culture* and *GDP per capita in 2015*. Column (2) controls for *GDP per capita in 1800* (data from Carreras et al 2005, with Spain being 100). *GDP per capita in 1800* has a negative association with weak significance in the second stage and no effect on *Culture* in the first stage. Since *GDP per capita in 1800* is only available at the autonomous community level, in Column (3) we repeat the same exercise but using *GDP per capita in 1860* (data from Díez-Minguela et al. 2018, with Spain being 100) which is later, but it is available at the province level. The coefficient of *GDP per capita in 1860* results insignificant in both stages. Column (4) introduces *Literacy rates in 1860*, which is the proportion of people that could read and write in the province in 1860 (data from DGIGE 1863). From the first stage regression, we can observe that *Literacy rates in 1860* has no effect on *Culture*, while the second stage reveals a weakly significant positive effect of *Literacy rates in 1860* on *GDP per capita in 2015*. Finally, column (5) controls for a battery of geographic factors: *Longitude*, *Latitude*, *Altitude*, *Coast Density* (length of the

coast divided by the province's area) and the ***Ruggedness*** of the terrain. Only in the second stage ***Altitude*** and ***Coast density*** show a significant positive effect on ***GDP per capita in 2015***.

It is worth emphasizing that in every specification in columns (2)-(5), ***Culture***'s coefficient remains positive, highly significant and with no substantial alterations in size across specification. Similarly, the instruments remain positive and significant, and only ***Constraints on Executive*** changed considerably in size in specification (5). This means that the effect hypothesized in the baseline specification is substantially robust.

Three types of tests are applied to evaluate the weakness of the instruments, the endogeneity of the dependent variable and the validity of the identification. To rule out the possibility that the instruments are weak, a commonly used rule of thumb is to obtain an *F-statistics* close to or greater than 10 in the first stage regression (Staiger and Stock 1997)—even if each coefficient has a p-value lower than 0.01. This requirement is met for all the regressions in Table 4. The endogeneity test reveals for all the specifications that it is convenient to treat ***Culture*** as an endogenous variable. The overidentification test, whose null hypothesis is that all the instruments are uncorrelated with the error term and, thus, are valid, is not rejected in any specification. Hence, the test could not capture any alternative omitted channel by which historical regional institutions affected current economic performance.

Table 4. Two-stage least square estimations

	(1)	(2)	(3)	(4)	(5)
Panel A: Second stage	*Dependent: GDP per capita in 2015 (indexed)*				
Culture	0.218***	0.215***	0.220***	0.200***	0.239***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)
GDP per capita in 1800 (indexed)		-0.108*			
		(0.00)			
GDP per capita in 1860 (indexed)			-0.096		
			(0.07)		
Literacy rate in 1860				0.475*	
				(0.24)	
Latitude					0.009
					(0.01)
Longitude					-0.009
					(0.01)
Altitude					0.142**
					(0.07)
Coast density					0.890**
					(0.41)
Ruggedness index					-0.001
					(0.00)
_cons	0.942***	1.050***	1.035***	0.844***	0.494
	(0.02)	(0.07)	(0.07)	(0.05)	(0.34)
Panel B: First stage	*Endogenous: Culture*				
Municipal autonomy in the Middle Ages	0.857***	0.852***	0.829***	0.856***	0.894***
	(0.20)	(0.20)	(0.20)	(0.25)	(0.24)
Constraints on the Executive 1600-1800	0.493***	0.500***	0.497***	0.494***	0.364***
	(0.10)	(0.10)	(0.10)	(0.11)	(0.12)
GDP per capita in 1800 (indexed)		0.141			
		(0.00)			
GDP per capita in 1860 (indexed)			0.348		
			(0.28)		
Literacy rate in 1860				-0.010	
				(1.32)	
Latitude					0.014
					(0.04)
Longitude					0.036
					(0.03)
Altitude					-0.48
					(0.32)
Coast density					0.139
					(1.85)
Ruggedness index					0.002
					(0.01)
_cons	-0.377***	-0.516	-0.701**	-0.379	-0.757
	(0.12)	(0.32)	(0.29)	(0.24)	(1.49)
N	50	50	50	50	50
F-statistics	41.82	27.49	28.70	27.28	12.91
Endogeneity tests (p-value)	0.00 / 0.00	0.00 / 0.00	0.00 / 0.00	0.00 / 0.00	0.00 / 0.00
Overidentification test	0.47/ 0.48	0.36/ 0.38	0.39 / 0.41	0.81/0.82	0.81/ 0.83

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: ***Municipal autonomy in the Middle Ages*** and ***Constraints on the Executive 1600-1800***. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid. GDP per capita 2015, 1860 and 1800 are indexed, with Spain being 1.

5. Convergence Analysis: Catch-up versus Cultural Coherence

In this section, we conduct a convergence analysis to further explore the heterogeneous effects of liberal institutions on regional economic distribution depending on cultural coherence. Intuitively, if cultural coherence with liberal institutions was an important factor influencing the regional distribution of economic development, we should be able to appreciate that in the long-term evolution of growth in the regions.

5.1. Basic Convergence Analysis

Table 5 shows the results of estimating a 2SLS regression of the growth rate between 1860 and 2015 (***Growth GDP per capita in 1860-2015***) on ***Culture*** and the initial level of development (***GDP per capita in 1860***). ***Culture*** has a positive and significant effect on growth, while ***GDP per capita in 1860*** has a significant, but negative effect on growth. Thus, we appreciate two forces affecting the growth rate: a catch-up effect, by which poorer provinces tend to grow faster and a cultural effect, by which provinces with a higher presence of cultural traits coherent with liberal institutions grow faster[28].

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[28] This phenomenon was also detected in Italy by Helliwell and Putnam (1995).

Table 5. The role of Culture in growth between 1860 and 2015

	(1)
Panel A: Second stage	*Dependent: Growth GDP per capita 1860-2015*
Culture	1.615**
	(0.63)
GDP per capita in 1860 (thousands)	-6.154***
	(0.00)
_cons	28.82***
	(4.72)
Panel B: First stage	*Endogenous: Culture*
Municipal autonomy in the Middle Ages	0.829***
	(0.23)
Constraints on the Executive in 1600-1800	0.497***
	(0.12)
GDP per capita in 1860	0.125
	(0.15)
_cons	-0.701*
	(0.41)
N	50
F-statistics	41.82
Endogeneity tests (p-value)	0.00 / 0.00
Overidentification test	0.47/ 0.48

Notes: Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: **Municipal autonomy in the Middle Ages** and **Constraints on the Executive in 1600-1800**. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid.

These two forces help explaining the trajectory of regional economic convergence in the last two centuries. Figure 7 shows the evolution of σ-convergence (standard deviation of the indexed GDP per capita) from 1860 to 2015. During the rearrangement of the regional economic distribution before 1930s, the evolution of σ-convergence was a bit messy: both components (catch-up and cultural effects) were operating to bring about the new distribution. With the retreat of liberal institutions during Franco's dictatorship the cultural component was annulled or attenuated, allowing for a cleaner catch-up effect, which improved the regional convergence until the transition to democracy at the end of the 1970s. Thereafter, with the return to a more liberal environment, the cultural component

strengthened its effect again and the convergence process stagnated. Moreover, it is worth

mentioning that in the early 1980s Spain established a system of interterritorial transferences

(*Fondos de Compensación Territorial*) to encourage the catch-up of less developed regions,

which, from 1986, was reinforced by the European structural and cohesion funds. Even in

the presence of this system of interregional transferences, the catch-up process could not

outweigh the cultural effect.
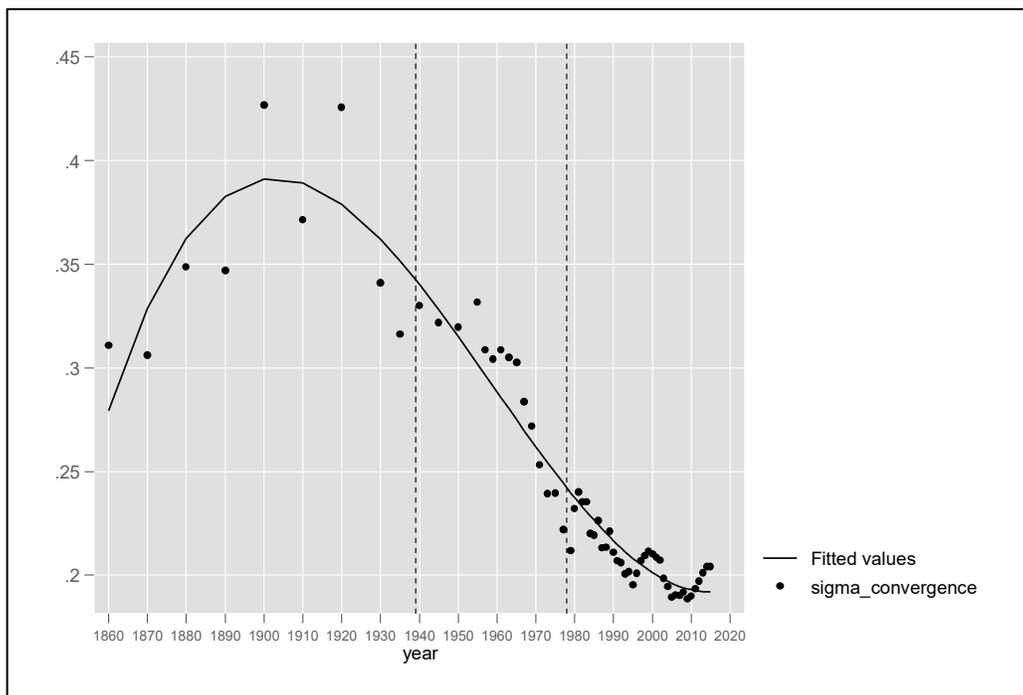
**Figure 7. Evolution of σ-convergence of Spanish regions (Standard deviation of the provincial distribution of GDP per capita in the period 1860-2015)**
Notes: The dots correspond to the standard deviation of the regional distribution of GDP per capita in the year and the line fits the data to a polynomial model. The vertical dashed lines encompass Franco's dictatorship.

5.2. Dynamic Panel Data Estimation

To obtain a more accurate picture of how the distribution of growth across regions is driven by the catch-up and cultural coherence effects, we estimate the following random effects model[29]:

$$G_{it} = \alpha + \beta C_{it} + \delta Y_{it-1} + \varepsilon_{it} \qquad (3)$$
$$C_{it} = \tau + \varphi C_{i0} + \theta Y_{it-1} + \omega_{it} \qquad (4)$$
$$C_{i0} = \rho + \pi IV1_i + \psi IV2_i + \upsilon_i \qquad (5)$$

where G_{it} is the growth of GDP per capita of province i from period $t-1$ to period t; C_{it} is the **Culture** of province i in period t and; Y_{it-1} is the GDP per capita of province i in period $t-1$; C_{i0} is the persistent component of **Culture**, which was shaped by the different political experiences in the regions as explained by equation (5); $IV1_i$ and $IV2_i$ are the historical variables **Municipal Autonomy in the Middle Ages** and **Constraints on the Executive in 1600-1800**. Thus, equation (3) simply states that growth (G_{it}) is affected by Culture in the same period (C_{it}, whose coefficient will be interpreted as the *coherent effect*) and by past levels of GDP per capita (Y_{it-1}, whose coefficient will be interpreted as the *catch-up effect*). Equation (4) postulates that **Culture** has two components: a persistent component and another one that is due to the prosperity levels (for example, as modernization theory would suggest). Equation (5) uses the historical instrumental variables that helped shaping the

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[29] Here we only claim to explain regional comparative growth among regions, not growth itself. The major component of growth is likely to be driven by institutional transformations, technological progress and trade opportunities.

persistent component of **Culture**. Unfortunately, C_{i0} is unobservable and, hence, it will be replaced by $IV1_i$ and $IV2_i$.[30]

Table 6 shows the results of estimating equations (3)-(5), dividing the dataset in 4 subsamples, each covering an interval of time for which GDP per capita data are available with homogeneous periodicity in Díez-Minguela et al. (2018) (every 10 years for 1860-1930, every 5 years for 1930-1955, every 2 years for 1955-1979 and every year for 1979-2015)[31]. In all cases, we show 2SLS estimations with **Municipal autonomy in the Middle Ages** and **Constraints on the Executive in 1600-1800** as instrumental variables. Since both **Culture** and the **lagged GDP per capita** (Y_{it-1}) are standardized variables, the sizes of the estimated coefficients are comparable, which allows us to assess the importance of the catch-up and coherence effects on the convergence process.

For all sample periods, the effect of Y_{it-1} is negative and statistically significant (β-convergence). Thus, in every period there was a catch-up effect influencing the distribution of growth across Spanish regions. On the other hand, **Culture** exhibits a positive effect on growth in all periods except in 1955-1979 (column 3) which encompasses the second half of Franco's Dictatorship. During this period, the dictatorship embarked in a series of economic reforms, including trade opening, and preparing the country to receive substantial flows of

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[30] In contrast with what we did in section 4.2., with this exercise, we are not testing the exogenous effect of **Culture** on economic development. Here contemporary economic prosperity is also helping to transform culture over time (in the first stage). Therefore, **Culture** C_{it} in the second stage shows variation over time, and this variation is due to a coevolution along with economic prosperity. In this exercise, we aim to reveal the role of cultural-institutional coherence in growth trajectories.

[31] To construct the variable **Growth of GDP per capita**, we computed GDP per capita in the provinces in absolute terms. For that, we multiplied Díez-Minguela et al.'s (2019) indexed provincial GDP per capita (Spain=1) by the Spanish real GDP per capita elaborated in the Maddison Project Database (Bolt et al. 2018).

foreign direct investments. This seems to have favored a catch-up effect, which was not offset by any significant coherence effect, producing as a result the large and long convergence process observed in Figure 7. However, with democratization and the transition to liberal institutions in the late 1970s, the coherent effect was activated again. Moreover, for the 1979-2015 period, the coherence effect outweighed the catch-up effect (the coefficient of *Culture* in column 4 is slightly larger than the one of lagged GDP per capita), halting the convergence process.

The 1930-1955 period merits a more detailed explanation. This period covers enormous institutional variation: The Second Republic (1931-1936), followed by the Spanish Civil War (1936-1939) and the first part of Franco's Dictatorship (1939-1955). Appendix 5 breaks down column (2) in three periods: 1930-1935, 1935-1940, 1940-1955. Both effects are significant during the period 1930-1935 —which encompasses most of the Second Republic— and the period 1935-1940 —which encompasses the Civil War—, but they turn insignificant during the first period of Franco's dictatorship, which was characterized by a strong autarchy and economic control.

Summing up, there are two key effects that drive comparative growth: a catch-up process that seems to be almost always active (apparently, except in the first part of Franco's dictatorship) and a coherence effect that is mainly active under liberal institutions. In the Ancient Regime and during the authoritarian Francoist dictatorship, this coherent effect was annulled or attenuated.

Table 6. Role of cultural-institutional coherence in the provincial historical patterns of growth

	(1)	(2)	(3)	(4)
	Sample 1860-1930	Sample 1930-1955	Sample 1955-1979	Sample 1979-2015
Panel A: Second stage	**Dependent: Growth of GDP per capita**			
Culture	0.065***	0.073***	-0.006	0.0141***
	(0.02)	(0.02)	(0.01)	(0.00)
Std. GDP per capita lagged 10 years	-0.068***			
	(0.02)			
Std. GDP per capita lagged 5 years		-0.066***		
		(0.02)		
Std. GDP per capita lagged 2 years			-0.016***	
			(0.01)	
Std. GDP per capita lagged 1 year				-0.0136***
				(0.00)
_cons	0.115***	0.001	0.086***	0.027***
	(0.01)	(0.01)	(0.00)	(0.00)
Panel B: First stage	**Endogenous: Culture**			
Municipal autonomy in Middle Ages	0.791***	0.681***	0.583***	0.517***
	(0.07)	(0.09)	(0.06)	(0.04)
Constraints on the Executive 1600-1800	0.442***	0.355***	0.302***	0.372***
	(0.04)	(0.05)	(0.03)	(0.02)
Std. GDP per capita lagged 10 years	0.163***			
	(0.04)			
Std. GDP per capita lagged 5 years		0.293***		
		(0.05)		
Std. GDP per capita lagged 2 years			0.038***	
			(0.01)	
Std. GDP per capita lagged 1 year				0.314***
				(0.02)
_cons	-0.348***	-0,300***	-0.256***	-0.228***
	(0.05)	(0.,05)	(0.03)	(0.02)
N	350	250	600	1800
F-statistics	224.99	179.61	470.26	1238.96
Endogeneity tests (p-value)	0.46/ 0.45	0.03/0.03	0.55/0.55	0.00 / 0.00
Overidentification test	0.11/ 0.11	0.93/0.93	0.32/0.32	0.18/ 0.18

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: **Municipal autonomy in the Middle Ages and Constraints on the Executive in 1600-1800**. GDP per capita data has different periodicity along the series: every 10 years in the period 1860-1930, every 5 years in the period 1930-1955, every 2 years in the period 1955-1979 and every year in the period 1979-2015. This is the reason we use different lags across specifications. **F-statistics** is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid.

6. In Search for the Missing Link between History and Modern Performance

Several empirical studies have documented the relation between historical experiences in the distant past and current economic and political outcomes (see, for example, the works cited in section 2.2.). The exact mechanisms that connect the distant past with current outcomes are the subject of an intense debate. For instance, Acemoglu et al. (2001) showed that the mortality rate of European colonizers affected the establishment of either inclusive or extractive political institutions in the colonies and, through that, current political and economic institutions and, therefore, current economic performance. Thus, in their view, the persistence of political institutions is the key link between past experiences and current economic outcomes (see also Acemoglu and Robinson 2012). Guiso et al. (2011), on the other hand, defended the role of culture as the missing link between past experiences and modern economic outcomes. As Guiso et al. (2016) argue, Acemoglu et al. (2001) "do not distinguish whether this impact is the direct effect of formal institutions' persistence or the indirect effect produced by institutional shocks on people's psyche and culture". In this section we explore the "missing link issue" in the context of Spanish regions.

Recently, Oto-Peralías and Romero-Ávila (2016) published a beautiful work that studies the connection between the Christian Reconquest and the current distribution of economic development across Spanish regions. Regarding the mechanisms, Oto-Peralías and Romero-Ávila (2016) suggested that the process of the Reconquest left different local systems across Spanish regions in terms of economic and political balance of power. Those areas with more balanced distribution of power were more able to take advantage of the new technological (i.e., industrial revolution) and institutional (i.e., liberal reforms in Spain) opportunities

available during the second half of the 19th century. Oto-Peralías and Romero-Ávila's explanation is similar to ours in many respects. Both works identify the Reconquest as an exogenous impact that significantly affected the local distribution of power in Spanish regions and the transformations of the 19th century as the trigger of the new regional economic distribution. The works, however, differ in the pointed mechanisms that transformed the regional economic distribution and that made it persist until the present time. Their interpretation of modern disparities of economic development is essentially focused in the local use of political power and the unequal distribution of economic resources and their explanation of the persistence of the regional economic distribution from the industrialization until today is based on agglomeration dynamics and the inheritance of a distribution of *de facto* power in the regions.[32] In contrast, we focus on the cultural legacy left by different political experiences. We argue that culture also made a difference in taking advantage of the 19th century technological opportunities (presumably equally available for all regions) and the national liberal reforms (also, presumably equally applying to all regions).

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[32] Only at the end of their conclusion, they briefly mention that cultural features could have been generated by this distribution of power.

Table 7. Missing link between history and modern performance

	(1)
Panel A: Second stage	Dependent: GDP per capita in 2015
Culture	0.148***
	(0.02)
Landless workers in 1797	-0.003**
	(0.00)
_cons	1.089***
	(0.08)

	Culture	Landless workers in 1797
Panel B: First stage		
Endogenous:		
Municipal autonomy in the Middle Ages	0.652***	0.471
	(0.22)	(5.71)
Constraints on the Executive in 1600-1800	0.788***	1.61
	(0.14)	(3.65)
Rate of Reconquest	-0.014	2.21***
	(0.02)	(0.46)
_cons	-0.114	34.43***
	(0.21)	(5.53)
N	45	
F-statistics	27.97	9.96
Endogeneity tests (p-value)	0.03 / 0.02	
Overidentification test	0.01 0.01	

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: **Municipal autonomy in the Middle Ages**, **Constraints on the Executive in 1600-1800** and **Rate of Reconquest**. *F-statistics* is F-test against the null that the instruments are irrelevant in the first-stage regression, which as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid.

In order to explore the role played by the mechanism stressed by Oto-Peralías and Romero-Ávila (2016) and ours, Table 7 repeats the regression in column (1) of Table 4, but this time including the variable used by Oto-Peralías and Romero-Ávila (2016) to proxy past material inequality (and concentration of *de facto* power) in the provinces; namely, **Landless workers in 1797**, which is the proportion of agricultural workers who did not own land. **Landless workers in 1797** is recognized as an endogenous variables and **Rate of reconquest** is included in the first stage as an additional instrumental variable. **Rate of reconquest** is the key instrumental variable employed by Oto-Peralías and Romero-Ávila (2016). It refers to the speed with which a territory was reconquered, which has presumably affected the

possibility of occurring a more complete and balance repopulation. Higher speed is associated with a higher concentration of economic and political power[33]. In the first stage, **_Rate of reconquest_** does not significantly affect **_Culture,_** but it is the only variable that significantly affects **_Landless workers in 1797_**. In the second stage, both **_Landless workers in 1797_** and **_Culture_** show a significant effect on the regional distribution of economic performance [34]. In conclusion, this exercise confirms a cultural channel that bears an important effect on economic performance even in the presence of an historical indicator for economic inequality—**_Landless workers in 1797_**[35]. It is important to stress that finding support for a cultural channel does not invalidate other possible mechanisms, including the channel emphasized by Oto-Peralías and Romero-Ávila (2016).

7. Robustness Checks and Additional Results

This section performs three robustness checks. First, we use genetic information to control for previous cultural patterns. Second, we control for tax autonomy in Basque Country and Navarre. Third, we explore different ways of defining **_Municipal autonomy in the Middle Ages_**.

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[33] The sample is restricted to those provinces that were actually reconquered, so those that remained in "the initial area of resistance" were removed (Asturias, Cantabria and the three provinces of Basque Country).

[34] To proxy concentration of political power, Oto-Peralías and Romero-Ávila used the percentage of population that lived under a seigneurial jurisdiction in 1797. However seigneurial jurisdictions were abolished in 1837.

[35] It is worth to mention that the overidentification test rejects the null that the instruments are valid (i.e., that the exclusion restrictions and the identification strategy are right). This did not happen in any model previously shown above. This does not mean that Rate of reconquest is an invalid instrument, running the basic model (only with our IVs) on this restricted sample (see footnote 32) achieves the same result in the overidentification test.

7.1. Controlling for Colonizers' Identity

The reconquest of the Iberian Peninsula by the Christian kingdoms began in their northern territories and progressed southwards. What if the identity of the colonizers was the key factor that explains interregional variation in cultural traits or some other factor that affects today's economic distribution? Different kingdoms would have brought to the reconquered territories different peoples, institutions, and cultural patterns, which persisted over time and still affect the current regional economic distribution. To rule out this possibility we employ genetic information as a proxy of colonizers' origin.
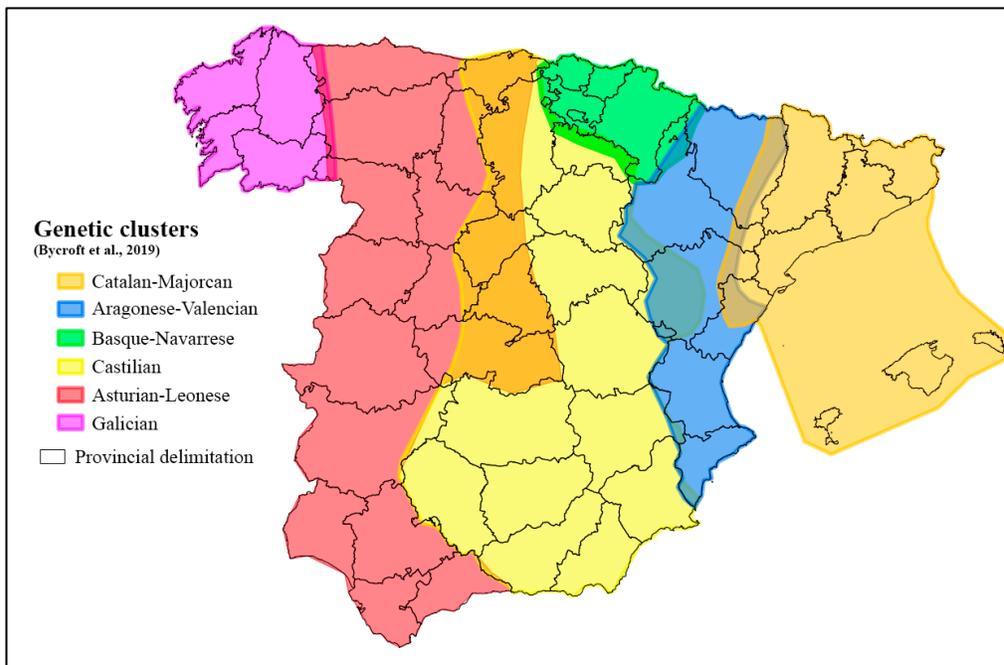

Figure 8. Genetic clusters in the Iberian Peninsula
Source: Own elaboration following Bycroft et al. (2019).

Bycroft et al (2019) identify five genetic clusters in the Iberian Peninsula today: Galician, Asturian-Leonese, Basque-Navarrese cluster, Castilian, Aragonese-Valencian, and Catalan-

Majorcan. Figure 8 depicts these clusters. In the figure, each color corresponds to the areas in which each cluster dominates; where there are more than one cluster, the layers overlap. As can be observed (and documented by Bycroft et al 2019), the geographic distribution of these clusters corresponds to the internal migration patterns occurred during the Christian Reconquest.

The identification of these genetic clusters allows us to test the impact of the origins of the colonizers. In these migratory movements occurred during the Reconquest, the colonizers would bring their cultures of origin, their institutional solutions, and their governance patterns, what would affect the way in which they would politically organize in the new settlement. Thus, by controlling for the identity of colonizers, we are controlling for cultural and institutional features of prior existence, that are contained in people's minds. Besides, we could be also controlling for relevant genetic traits that vary across clusters. If our variable *Municipal Autonomy in the Middle Ages* loses its significance to these genetic variables, it might mean that either municipal inclusiveness and the subsequent political trajectories were not the source of cultural differences or that even the cultural traits identified by us are not important. By contrast, it would mean that other factors related to these genetic clusters (e.g., prevailing institutions in the colonizers' region of origin, other prior cultural traits, or distinctive genetic features) would explain better current regional economic patterns.

To include genetic clusters in the analysis, we consider two different samples: full and restricted. The full sample contains the municipalities of all the autonomous communities

except Canary Islands, Basque Country and Navarre, and the autonomous cities of Ceuta and Melilla[36]. The restricted sample contains the municipalities of the most proximate provinces to both sides of the frontier of *Municipal Autonomy in the Middle Ages*[37]. In the full sample, the municipalities in the area that experienced autonomy in the Middle Ages have, on average, an income per capita around 6,000 euros higher in 2016, while in the restricted sample the gap is around 4,000 euros[38]. Thus, even restricting the sample to the proximity of the frontier of *Municipal autonomy in the Middle Ages*, the discontinuity is still substantial. However, it could be argued that these gaps are due to geographical factors[39].

Table 8 performs a series of regressions to test whether this income per capita difference is significant and robust to different controls, including genetic clusters and geographic variables. Column (1) regresses municipal income on *Municipal autonomy in the Middle Ages* and the geographical coordinates as a cubic polynomic function for the full sample, and column (2) for the restricted sample. In both regressions, the coefficient of *Municipal autonomy in the Middle Ages* is highly significant. The rest of the columns introduce information about the genetic clusters identified by Bycroft et al. (2019). For each genetic cluster, a dummy variable is created. Column (3) regresses municipal income on the genetic

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[36] Canary Islands, Ceuta and Melilla are absent in Bycroft et al. (2019) work and Basque Country and Navarra do not appear in our income dataset, elaborated by the Spanish Ministry of Finance, since they have their own independent public finance and income tax.

[37] The provinces included in this restricted sample are: Asturias, Cantabria, León, Palencia, Zamora, Valladolid, Salamanca, Ávila, Cáceres, Madrid, Toledo, Guadalajara, Cuenca, Teruel, Castellón and Valencia.

[38] In the full sample, the average income per capita in 2016 of municipalities in the area that experienced (did not experience) autonomy in the Middle Ages is 24,655 (18,536). In the restricted sample, the average income per capita in 2016 of municipalities in the area that experienced (did not experience) autonomy in the Middle Ages is 23,812 (19,804).

[39] For example, north-south gaps can be attributed to temperature or sunny days, and west-east gaps to proximity to continental Europe.

clusters[40]. All the clusters are significant in the absence of other controls and the order in coefficient size is the following: Galician, Castilian, Asturian-Leonese, Aragon-Valencian and Catalan-Majorcan. Column (4) introduces *Municipal Autonomy in the Middle Ages*. Note that the coefficient of *Municipal Autonomy in the Middle Ages* is very similar to its coefficient in column (1) while the genetic variables' coefficients are substantially reduced with respect to column (3).

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[40] Since these clusters (and dummies) overlap there is no reference category and all the variables are included in the regression.

Table 8. Income per capita in the municipalities explained by municipal autonomy in the Middle Ages, genetic clusters, and other controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent	*Average gross income per capita in the municipality in 2016*							
Municipal Autonomy in the Middle Ages	3473***	1920***		3530***	2764***	1380***	2216***	1978***
	(324)	(478)		(243)	(322)	(488)	(339)	(465)
Genetics: Galician cluster			3431***	2039***	722	460	1760***	1328
			(480)	(438)	(629)	(737)	(659)	(975)
Genetics: Asturian-Leonese cluster			4217***	2327***	3693***	2447***	3566***	2956***
			402	(360)	(359)	(921)	(345)	(929)
Genetics: Castilian cluster			3535***	1653***	1617***	1927***	2046***	1407**
			(396)	(357)	(334)	(712)	(312)	(633)
Genetics: Aragonese-Valencian cluster			5363***	3046***	-377	401	150	1455
			(519)	(492)	(423)	(1126)	(430)	(1026)
Genetics: Catalan-Majorcan cluster			11143***	6637***	-2333***	-9513***	-1234**	-5906***
			(524)	(539)	(606)	(1034)	(587)	(1045)
_cons	15503***	-9219774***	14634***	16085***	11874***	-1.06e+07***	2882074***	-4266747
	(93)	(2680975)	(444)	(399)	(393)	(3010631)	(47973)	(3822731)
Coordinates controls (cubic polynomials)	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Other geographic controls	No	No	No	No	No	No	Yes	Yes
Other controls: capital, coal mines and thermal plants	No	No	No	No	No	No	Yes	Yes
Sample	Complete	Restricted	Complete	Complete	Complete	Restricted	Complete	Restricted
N	2817	939	2817	2817	2817	939	2815	939
R²	0.3584	0.1679	0.2847	0.3308	0.3898	0.2131	0.4767	0.3475

Notes: Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: OLS. **Coordinates controls** is a cubic polynomial with latitude and longitude. **Other geographic controls** include the mean ruggedness of the terrain of the municipality, the altitude of its centroid, its population density and whether it has coast or not. **Other controls** add dummies that take value 1 when the municipality is the capital of the province, has a coal mine, has a thermal power plant and when it is a neighbor of a municipality with these features.

Column (5) adds to column (4) a cubic polynomial with the coordinates (latitude and longitude). *Municipal Autonomy*'s coefficient is moderately altered, Galician and Aragonese-Valencian clusters turn insignificant, the eastern Catalan-Majorcan cluster changes the sign of its effect, and Castilian and Asturian-Leonese clusters (although altered) preserve certain consistence. Thus, the introduction of geographic coordinates seems to make most genetic indicators unstable. Column (6) repeats the regression of column (5) over the restricted sample. *Municipal Autonomy*'s coefficient gets moderately altered with respect to column (2), and the genetic variables show similar general results as in column (5) for Castilian, Asturian-Leonese, Aragonese-Valencian and Galician clusters, and gets more extreme for the Catalan-Majorcan cluster that now show a coefficient of -9512. Columns (7) and (8) repeat the exercise for both samples including geographic (coast, altitude, ruggedness and population density) and other controls (indicating if the municipality or its neighboring municipality is capital of the province, has a coal mine or has a thermic power plant). In both cases, *Municipal Autonomy*'s coefficient remain highly significant and moderately altered despite the presence of genetic indicators and a large set of other controls.

7.2. Controlling for Tax Autonomy in Basque Country and Navarre

The tax autonomy of Basque Country and Navarre is a historical right recognized in their historical fueros and now regulated by the institutions of "Concierto Vasco" and "Convenio Navarro", respectively. These agreements were set after the abolishment of the Basque and Navarrese fueros and regulate the financial and tax autonomy of these regions. They entitle

their regional governments to decide, collect and manage their own taxes and establish the contributions to the Spanish public budget. The rest of autonomous communities are integrated in the Spanish system and have limited tax autonomy. To eliminate the remote possibility that our variable **Culture** is simply capturing the effect of this special arrangement, in Table 9, we repeat the basic regression in Table 4 column (1), but now controlling for tax autonomy, which is a dummy variable that takes value 1 for Navarre and the Basque provinces. Culture remains highly significant in the second stage. Moreover, in the first stage tax autonomy shows a negative significant effect on culture. Thus, our results persist once we control for the tax autonomy of the Basque Country and Navarre.

Table 9. Controlling for tax autonomy in Basque Country and Navarre

	(1)
Panel A: Second stage	*Dependent: GDP per capita in 2015*
Culture	0.178***
	(0.03)
Tax autonomy	0.133*
	-0.08
_cons	0.931***
	-0.02
Panel B: First stage	*Endogenous: Culture*
Municipal Autonomy in the Middle Ages	0.754***
	(0.20)
Constraints on the Executive in 1600-1800	0.865***
	(0.10)
Tax autonomy	-1.469**
	(0.61)
_cons	-0.214***
	(0.14)
N	50
F-statistics	32.72
Endogeneity tests (p-value)	0.00 / 0.00
Overidentification test	0.02/ 0.01

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: **Municipal Autonomy in the Middle Ages** and **Constraints on the Executive in 1600-1850**. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid.

7.3. On the Building of *Municipal Autonomy in the Middle Ages*

As explained in section 3.3.1 to construct the variable *Municipal Autonomy in the Middle Ages* we rely on historical evidence to approximate the geographical demarcation of relatively inclusive areas with municipal autonomy. There are, however, some potentially contentious cases. For this reason, Table 10 re-estimate the 2SLS specification of section 4.2, using several alternative ways of classifying these cases in the construction of *Municipal Autonomy in the Middle Ages*. Column (1) shows the baseline regression reported in section 4.2, while columns (2)-(4) show the same regressions using three alternative constructions of *Municipal Autonomy in the Middle Ages*. Results remain almost unaltered. Thus, the criteria employed to classify these potentially contentious is not critical for our results.

There are three potentially contentious cases:

1. Province of Castellon

The case of the province of Castellon is special. This province was rapidly reconquered and granted with many local fueros but immediately afterwards the king enacted a kingdom-wide extensive code denoted *Furs de Valencia*. Only 25 years passed from the establishment of the first local *fuero* to the enactment of the *Furs*. Furthermore, it is not clear whether these specific local fueros were brief or extensive (Romeu Alfaro 1972). However, after the enactment of the *Furs de Valencia*, these municipalities were granted the right to keep their special regime based in Aragon's legal tradition. This is the reason, in our baseline definition, *Municipal Autonomy in the Middle Ages* adopts the value 1 for this province. Changing this classification, however, barely affects the results, as can be observed in column (2).

Table 10. Potentially contentious cases regarding the definition of *Municipal autonomy in the Middle ages*

	(1)	(2)	(3)	(4)
Panel A: Second stage	*Dependent: GDP per capita*			
Culture	0.218***	0.221***	0.219***	0.21***
	(0.03)	(0.03)	(0.03)	(0.03)
_cons	0.942***	0.942***	0.942***	0.942***
	(0.02)	(0.02)	(0.02)	(0.02)
Panel B: First stage	*Endogenous: Culture*			
Municipal autonomy in the Middle Ages (baseline)	0.857***			
	(0.20)			
Municipal autonomy in the Middle Ages (without Castellon)		0.810***		
		(0.20)		
Municipal autonomy in the Middle Ages (with Leonese extremadura)			0.700***	
			(0.20)	
Municipal autonomy in Middle the Ages (with southern fueros breves)				0.707***
				(0.20)
Constraints on the Executive in 1600-1800	0.493***	0.518***	0.549***	0.562***
	(0.10)	(0.10)	(0.10)	(0.10)
_cons	-0.377***	-0.34***	-0.335**	-0.367**
	(0.12)	(0.12)	(0.13)	(0.14)
N	50	50	50	50
F-statistics	41.82	39.74	35.31	36.36
Endogeneity tests (p-value)	0.00 / 0.00	0.00 / 0.00	0.00 / 0.00	0.00 / 0.00
Overidentification test	0.47 / 0.48	0.32 / 0.33	0.34 / 0.35	0.89 / 0.90

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: **Municipal autonomy in the Middle Ages** and **Constraints on the Executive in 1600-1800**. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid. GDP per capita 2015, 1860 and 1800 are indexed, with Spain being 1.

2. Elaboration of extensive fueros by specific municipal councils in the Kingdom of Leon

To approximate the geographical extension of municipal autonomy in the Iberian Peninsula in the Middle Ages, we use the existence of *fueros breves* without the ruling of an underlying extensive legal code. We consider that when an underlying extensive code existed, there was

usually no need to elaborate further the legal code. In fact, if that underlying code was the *Liber Iudiciorum*, which granted the power to legislate only to the King, the city councils were not even allowed to develop legislation without royal authorization. This was the case in the Kingdom of Leon. However, in the 13th century, the attitude of the Kingdom of Leon towards municipal legislative autonomy seemed to become more flexible and it allowed some councils in the so-called *Leonese extremadura* to elaborate their municipal codes in order to adapt their norms to the life at the frontier with the Muslim dominions. These exceptional cases were the city of Zamora (Zamora), Alba de Tormes (Salamanca), Ciudad Rodrigo (Salamanca), Ledesma (Salamanca), and the city of Salamanca (Salamanca). For this reason, column (3) reclassifies Zamora and Salamanca as provinces with Municipal Autonomy in the Middle Ages. Results persist.

3. Brief fueros at the south of the "Town and Land Communities"

Some southern provinces beyond the "Town and Land Communities" had a few cases of brief fueros, but we have classified them as provinces in the area with no municipal autonomy in the Middle Ages. Three of these fueros were granted by Alfonso VII. After his reign, the policy of extensive fueros became prevalent. The remaining were granted to small towns by different elites from Toledo. The rest of southern Spain was full of extensive fueros. Reclassifying these cases, however, does not affect the results. Column (4) shows the estimations when Cuenca, Toledo, Ciudad Real and Badajoz are included in the area with Municipal Autonomy in the Middle Ages. Results are still quite robust.

8. Concluding Remarks

This article has explored the effect of cultural traits that foster active participation and facilitate cooperation on the economic performance of liberal institutions. We have coined the notion of cultural-institutional coherence to refer to the matching between cultural traits and formal institutions and apply it to the case of Spanish regions. The variable ***Culture***, with which regional variation in these cultural traits was proxied, has been found to be positively related to better economic performance, but only under liberal institutions. Moreover, this relationship is robust to other relevant geographic and socio-economic factors. Reverse causality was circumvented through a two-step least square model, using as instrumental variables two proxies of inclusiveness in different periods of the regional historical trajectories (***Municipal autonomy in the Middle Ages*** and ***Constraints on the Executive in 1600-1800***).

Three key messages emerge from this paper. First, liberal institutions have heterogeneous effects on economic performance, which depend on the existence of coherent cultural traits. Second, these cultural traits produce better economic performance within liberal institutional contexts. Third, culture is one of the missing links that connects the Christian Reconquest of the Iberian Peninsula with current regional economic distribution.

The paper also suggests several paths for future research. We will just briefly discuss four of them.

On data limitations

The variable ***Culture*** is built from a few cultural indicators in individual surveys conducted by the Spanish Center of Sociological Research. Unfortunately, these surveys do not include potential relevant indicators, such as self-efficacy beliefs (Guiso, Sapienza, and Zingales 2016) or the tendency to encourage independence in children (Tabellini 2010). It would also be important to find a way to proxy the historical geographical distribution of these cultural traits in order to confirm their existence and persistence. Finally, it would be desirable to have instrumental variables with a wider graduation. The one used here to proxy municipal autonomy in the Middle Ages only distinguishes two groups. It is a key distinction, since it triggered remarkably different political trajectories prior to unification, but we cannot observe intragroup differences.

The cultural legacy of institutions

Regarding the effect of experiencing municipal autonomy in the Middle Ages on culture, the very root of the cause remains unclear. Are the foundational origins of these new municipal social orders (more equal *de jure* and *de facto*) what brought about a feeling of self-esteem and competence and cooperative spirit? Or, rather, is the political experience, no matter how the origin was, what fosters the development of these cultural traits? Was the simple space of freedom what triggered the development of these traits or the actual empowerment of the population in the political life of the community?

Culture as the missing link

This work invites us to revisit investigations on the role of institutions on development, such as Hall and Jones (1999), Acemoglu et al. (2001) and Rodrik et al. (2004). Culture can be influencing development more than what has usually been recognized. In the case of the connection between the Christian Reconquest and current regional economic distribution, culture seems to have worked as a link between past institutions and today's performance.

The cultural legacy that inclusive and extractive institutions left in the former colonies could be affecting today's economic performance and the long institutional path-dependence. This does not invalidate other possible links, but our results suggest that culture has its own persistence channel and mechanisms to affect current economic performance.

The importance of these cultural traits

Many unknows remain regarding the relationship between liberal institutions, culture, and development. Are all the (political-economic) systems equally dependent on the local culture for its performance? Are only liberal frameworks the ones that make culture matter? In the case of Spanish regions, our results suggest that, in non-liberal regimes, these cultural traits do not make the difference in economic performance or their impact is attenuated.

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Appendix 1. Maps of Spanish Autonomous Communities and Provinces

Autonomous Communities

1. Galicia
2. Principality of Asturias
3. Cantabria
4. Basque Country
5. Navarre
6. Aragon
7. Catalonia
8. Castilla and León
9. La Rioja
10. Community of Madrid
11. Extremadura
12. Castilla-La Mancha
13. Valencian Community
14. Balearic Islands
15. Andalusia
16. Region of Murcia
17. Canary Islands
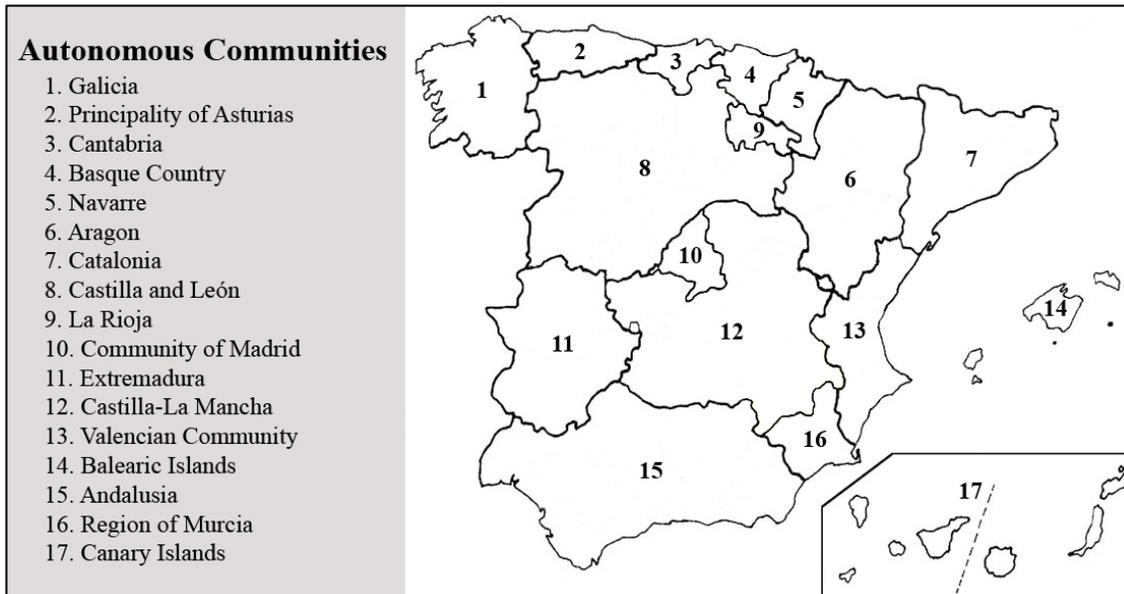
Figure A.1 Map of Spanish Autonomous Communities

Provinces

|	
1. A Coruña	26. Segovia
2. Lugo	27. La Rioja
3. Pontevedra	28. Madrid
4. Ourense	29. Cáceres
5. Asturias	30. Badajoz
6. Cantabria	31. Guadalajara
7. Biscay	32. Toledo
8. Gipuzkoa	33. Cuenca
9. Alava	34. Ciudad Real
10. Navarra	35. Albacete
11. Huesca	36. Castellón
12. Zaragoza	37. Valencia
13. Teruel	38. Alicante
14. Lleida	39. Balearic Islands
15. Girona	40. Huelva
16. Barcelona	41. Seville
17. Tarragona	42 Córdoba
18. Leon	43. Jaén
19. Palencia	44. Cádiz
20. Burgos	45. Málaga
21. Zamora	46. Granada
22. Valladolid	47. Almería
23. Soria	48. Murcia
24. Salamanca	49. Santa Cruz de Tenerife
25. Ávila	50. Las Palmas

Figure A.2. Map of Spanish Provinces

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Appendix 2. Variables' Description, Aggregation, Source and Main Descriptive Statistics

Table A.1. Variables' description, sources, and descriptive statistics

Variable	Description	Aggregation	Source	Obs	Mean/freq.	Std. Dev.	Min	Max
Dependent variables								
GDP per capita in 2015	Indexed GDP per capita in 2015 (Spain=1)	Province	Díez-Minguela et al. (2018)	50	0.94	0.2	0.67	1.54
Growth of GDP per capita	Rate of growth using the indexed GDP per capita in the provinces (Díez-Minguela et al., 2018) multiplied by Maddison Project's series of real GDP per capita for Spain	Province	Díez-Minguela et al. (2018) and Maddison Project (Bolt et al. 2018)	Depends on the analyzed period. See main text.				
Variables on culture								
interest in politics	Interest in politics	Province	CIS (2015, 2016c, 2019a, 2019b)	50	0	1	-2.15	2.72
Trust	Generalized trust	Community	CIS (2016a, 2016b)	50	0	1	-1.72	2.2
Association	Participation in twelve kinds of associations	Community	CIS (2016a, 2016b, 2019c)	50	0	1	-2.55	3.44
Action	Participation in alternative ways of political actions	Community	CIS (2016a, 2016b, 2019c)	50	0	1	-1.43	3.21
Culture	First principal component from all political culture of participation indicators	Province	Own	50	0	1	-1.96	2.57
Instrumental variables								
Municipal Autonomy in the Middle Ages	Local development of a custom-based legal order in the High Middle Ages	Province	Based on Barrero and Alonso (1989)	50	22*			
Constraints on the Executive in 1600-1800	Principal component of constraints on the Executive in the years 1600, 1700, 1750, 1800	Community	Tabellini (2010), own.	50	0	1	-0.53	2.88
Rate of reconquest	Rate of reconquest	Province	Oto-Peralías and Romero-Ávila (2016)	50	7.08	5.94	0	22.53
Control variables								
Literacy rate in 1860	Percentage of population in the province that could read and write in 1860	Province	DGIGE (1863)	50	0.21	0.08	0.09	0.41
GDP per capita in 1800	Indexed GDP per capita in 1860 imputed to the province (Spain=1)	Community	Carreras et al. (2005)	50	1	0.3	0.51	1.71
GDP per capita in 1860	Indexed GDP per capita in 1860 imputed to the province (Spain=1)	Province	Díez-Minguela et al. (2018)	50	0.97	0.31	0.21	1.8
Landless Workers in 1797	Proportion of landowners over the population employed in agrarian activities in the province in 1797	Province	Oto-Peralías and Romero-Ávila (2016)	50	47.99	21.27	3.74	85.77
Latitude	Latitude (degrees) of the capital of the province	Province	aemet.es	50	40.1	3.16	28.2	43.5
Longitude	Longitude (degrees) of the capital of the province	Province	aemet.es	50	3.84	3.73	-2.82	16.25
Altitude	Altitude in meters of the capital of the province	Province	aemet.es	50	0.37	0.368	0.01	1.13

Coast density	Province's coast length divided by province area	Province	Based on INE (2003)	50	0.03	0.06	0	0.29
Ruggedness	Terrain Ruggedness Index	Province	Goerlich and Cantarino (2010)	50	33.52	14.8	9.43	75.25
Variables for Section 7.1								
Average gross income per capita in the municipality in 2016	Average gross income per capita in the municipality in 2016 in euros	Municipality	www.agenciatributaria.es	2817	20658.57	5598.65	11166	72993
Galician cluster	Area with presence of Galician genetic cluster	Municipality	Bycroft et al. (2019)	2817	290*			
Asturian-Leonese cluster	Area with presence of Asturian-Leonese genetic cluster	Municipality	Bycroft et al. (2019)	2817	1034*			
Castilian cluster	Area with presence of Castilian genetic cluster	Municipality	Bycroft et al. (2019)	2817	925*			
Aragonese-Valencian cluster	Area with presence of Aragonese-Valencian genetic cluster	Municipality	Bycroft et al. (2019)	2817	409*			
Catalan-Majorcan cluster	Area with presence of Catalan-Majorcan genetic cluster	Municipality	Bycroft et al. (2019)	2817	552*			
Ruggedness	Terrain Ruggedness Index of the municipality	Municipality	Goerlich and Cantarino (2010)	2815	150.77	136.56	0.56	918
Population density	Number of inhabitants per hectare	Municipality	www.ign.es	2817	3.91	12.8531	0.017	215
Altitude	Altitude of the centroid of the municipality in meters	Municipality	www.ign.es	2817	410.88	310.308	1	1409
Coast	Dummy that takes value 1 if the municipality is in the coast	Municipality	www.ign.es	2817	338*			

Notes: Those variables with an autonomous community level of aggregation impute the values to their provinces. * Dummy variable: instead of the mean, the frequency of times the dummy takes value 1 is displayed.

Appendix 3. Historical Development in the Provinces before 1860

We have seen that during the 19th century and until the 1930s some sort of reorganization was occurring in the geographic economic distribution and, thereafter, it remained stable. We suggested that the institutional changes in the 19th century were responsible for triggering this reorganization. In this appendix, we confirm that the distribution before the 1930s was not unstable and that the 19th century transformations induced a reconfiguration from one stable status quo to a different one.

Our historical data on regional economic development (Diaz-Minguela et al., 2019) start in 1860, so we could not see back beyond that year. Next, we build a measure to proxy the provincial distribution of economic development before 1860.

The urbanization rate has been recurrently used as a proxy for the income level when conventional measures are not available (De Long and Schleifer, 1993; Acemoglu et al., 2002; Dittmar, 2011). This indicator refers to the percentage of people living in cities. Bairoch et al. (1988) provided a database with all the European cities of more than 5,000 inhabitants in different years: 800, 900, 1000, 1200, 1300, 1400, 1500, 1600, 1700, 1750 and 1850. To be included on this list the city must have had at least 5,000 inhabitants at some point between the years 800 and 1850. Since we can locate all these cities within current provinces, with this information we can elaborate an urbanization rate for the Spanish provinces. However, to build this urbanization rate we would need the total population of the province, which, unfortunately, to the best of our knowledge is not available. To account for some sort of density of urbanization in the provinces, Oto-Peralías and Romero-Ávila (2016) used the extension of the province as denominator. We follow their steps and build an indicator that corresponds to the number of people living in a city of more than 5,000 inhabitants divided by the extension of the province.

Table A.2 shows the correlation among the urbanization rates for all those available years. It also adds GDP per capita in 1860 and 2015. First, we must confirm that urbanization density is a decent proxy for economic development. In the cell corresponding to row 12 and column 11, we observe that the correlation between GDP per capita in 1860 and our measure of urbanization density for 1850 is 0.67 and significant at 1%.

We can observe that, before the 19th century, there was certain degree of stability in the geographical distribution of development. Indeed, urban density in 1850 is positively and significantly correlated with urban density in all periods from 1300 (row 11). However, GDP per capita in 2015 is never significantly correlated with past urban density (or GDP per capita in 1860), except for the year 1500, with which it is inversely correlated (row 13) This suggests that the current geographical distribution of economic development does not simply mirrors the historical distributions and, hence, the transformations of the 19th century were not a mere temporary disturbance.

Table A.2. Correlation matrix: economic development in the provinces across historical periods

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
		urban_800	urban_900	urban_1000	urban_1200	urban_1300	urban_1400	urban_1500	urban_1600	urban_1700	urban_1750	urban_1850	gdppc_1860	gdppc_2015
[1]	urban_800	1.0000												
[2]	urban_900	0.1876	1.0000											
[3]	urban_1000	0.9655**	0.1579	1.0000										
[4]	urban_1200	0.5035**	0.2553	0.5700**	1.0000									
[5]	urban_1300	0.3319*	0.1811	0.3552*	0.6810**	1.0000								
[6]	urban_1400	0.3049*	0.1359	0.3238*	0.6579**	0.8510**	1.0000							
[7]	urban_1500	0.2654	0.0832	0.3328*	0.5133**	0.7514**	0.6530**	1.0000						
[8]	urban_1600	0.2031	0.2995*	0.2223	0.4521**	0.5267**	0.4493**	0.6986**	1.0000					
[9]	urban_1700	0.1979	0.1148	0.1970	0.2986*	0.4198**	0.4461**	0.5757**	0.7952**	1.0000				
[10]	urban_1750	0.1438	0.0815	0.1665	0.3515*	0.3848**	0.4222**	0.5734**	0.7636**	0.9596**	1.0000			
[11]	urban_1850	-0.1122	0.0002	0.1653	0.2819	0.4079**	0.4955**	0.4677**	0.5690**	0.8077**	0.8383**	1.0000		
[12]	gdppc_1860	0.1226	0.1040	0.1239	0.3684**	0.5778**	0.6063**	0.5889**	0.5989**	0.7532**	0.7485**	0.6667**	1.0000	
[13]	gdppc_2015	-0.2535	-0.0622	-0.2431	-0.2460	-0.1436	-0.2342	-0.3550*	-0.1945	-0.0527	-0.0725	0.0736	0.0274	1.0000

Notes: *Significant at 5%, **significant at 1%.

Appendix 4. Construction of *Municipal Autonomy in the Middle Ages* and *Constraints on the Executive in 1600-1800*

This appendix summarizes the methodologies employed to construct the two variables for instrumenting **Culture**, namely, ***Municipal autonomy in the Middles Ages*** and ***Constraints on the executive in 1600-1800***.

Appendix 4.1. Municipal Autonomy in the Middle Ages

Appendix 4.1.1. Building an Indicator of Local Autonomy in the Middle Ages from Local Legal Codes

The starting point to build *Municipal Autonomy in the Middle Ages* is the kind of fuero that was granted to the local entity in the first place. Often, local entities were granted different fueros in various moments of time either confirming, complementing, or replacing former fueros. The first map in Figure A.3 (top left) shows all the places with local fueros contained in the compilation of fueros elaborated by Barrero and Alonso (1989). We can observe that they were spread across all the Iberian Peninsula. The second map (top right) removes all those places whose first fueros were extensive; thus, retaining places with only brief fueros. In this map, almost all the places in the southern half of Spain disappeared. The third map (bottom left) removes from the second map all those places that, in the moment of receiving their first local brief fuero, had a territorial extensive legal code in force (from the beginning in the Kingdom of Leon[41], from 1348 in the Kingdom of Castile, from 1238 in the Kingdom of Navarre, from 1283 in the Kingdom of Aragon, from 1251 in Catalonia, from 1261 in the Kingdom of Valencia and from 1230 in the Kingdom of Majorca). The fueros granted by religious military orders have been also removed from this third map; since they are not representative of the

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[41] Here the eastern frontier of the Kingdom of Leon (with the Kingdom of Castile) is assumed to be the one established in 1157 by the will of Alfonso VII and definitely confirmed and detailed in the 1183 Fresno-Lavandera Treaty (González 1982). This border thus geographically delimited the application of the *Liber Iudiciorum* as a suppletory large legal code and consequently the constriction of municipal autonomy.

phenomenon under study and their concession did not follow the general trend in the Iberian Peninsula. For instance, the southernmost places that were granted a brief legal code by a king were in northern Cuenca and Toledo, (close to the frontier with Madrid), in the 12th century. Military orders continued conceding short legal codes of their convenience.
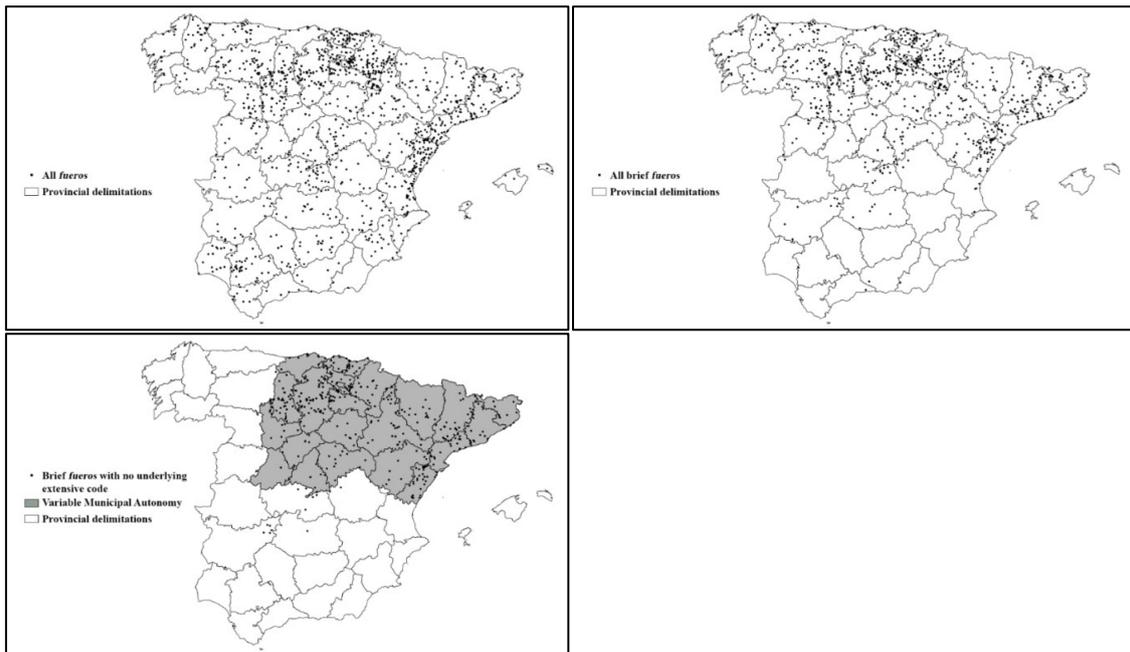

Figure A.3. Maps with the geographical distribution of municipal *fueros* in the Middle Ages
Notes: Top left map shows all the fueros contained in Barrero and Alonso (1989). Top right map represents the locations that received only *fueros breves* in the first place. Bottom left map restricts the sample to those fueros breves that had no underlying extensive legal codes and show (in dark) the provinces that get value 1 in the dummy called Municipal Autonomy in the Middle Ages.

With this information we proceed to geographically delimit those more inclusive local regimes. The grey area in the third map (bottom left) indicates the provinces that are believed to have enjoyed significant levels of municipal autonomy before the prevalence of large local fueros and the enactment of large territorial legal codes. Still we can see a few dots outside the grey area. Three of these fueros were granted by Alfonso VII. After his reign, the policy of extensive fueros became prevalent. The remaining were granted to small villages by different elites from Toledo. The rest of southern Spain was replete with extensive fueros.

The case of the province of Castellon is special. This province was rapidly reconquered and granted with many local fueros but immediately afterwards the king enacted a kingdom-wide extensive code denoted *Furs de Valencia*. Only 25 years passed from the establishment of the first local *fuero* to the enactment of the *Furs*. Furthermore, it is not clear whether these specific local fueros were brief or extensive (Romeu Alfaro 1972). However, after the enactment of the *Furs de Valencia*, these municipalities were granted the right to keep their special regime based in Aragon's legal tradition. This is the reason we decided to include this province in the grey shaded area. Changing this classification, however, barely affects the results, as we have confirmed in section 7.3.

Appendix 4.1.2. On Alternative Indicators to Account for the Generalized Presence and Incidence of Municipal Autonomy

Other *a priori* more sophisticated indicators for municipal autonomy in the Middle Ages could be built. Next, we present two of them. Our aim is to geographically delimit the presence of more inclusive local orders and we use a dummy variable to capture the existence or nonexistence of them in the provinces. This variable relies on the prevalence of experiences of municipal autonomy, known by the presence of towns with only a brief legal code that had to be further developed locally. Two alternative ways to define the presence and incidence of municipal autonomy are: (i) to count the number of towns that experienced municipal autonomy in each province; and (ii) to compute the density of these cases per square kilometer of surface in the province[42]. Table A.3 shows the correlation of the three indicators with the variable **Culture** (column 1). Our variable, i.e., **Municipal autonomy in the Middle Ages** based on the simple presence of these towns in the provinces (raw 2), is the most correlated with **Culture**.

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[42] In this sense, it would be optimal to use the proportion of people in the province living in these more autonomous towns, but this information is not available.

Table A.3. Correlation matrix between *Culture* and different indicators for municipal autonomy made from data on the ruling of brief fueros with no underlying extensive code

	[1] Culture	[2] Presence of b.f.	[3] Count of b.f.	[4] Density of b.f.
[1] *Culture*	1			
[2] *Presence of brief fueros*	0.6761	1		
[3] *Count of brief fueros*	0.5025	0.6906	1	
[4] *Density of brief fueros*	0.5670	0.6540	0.7191	1

One problem with these alternative measures is that jurisdictions were of different size in surface and population, hence using them as a proxy of incidence can be misleading. A higher density or number of jurisdictions in the province does not necessarily reveal a greater depth of self-governance nor the involvement of a higher proportion of the population. For instance, the medieval jurisdiction of the municipality of Ávila practically affected the entire (current) province of Avila and the Community of Town and Land of Segovia even included a huge proportion of the current province of Madrid. Thus, with only one case most province could have been affected.

Appendix 4.2. Constraints on the Executive in 1600-1800

Tabellini (2010) makes an assessment of past constraints on the executive in the years 1600, 1700, 1750, 1800 and 1850, following Polity IV methodology (see Tabellini's 2005 working paper). This methodology assigns a value between 1 and 7, with 1 being "unlimited authority" and 7 being "accountable executive, constrained by checks and balances". Between both extremes other situations are defined: 3 means that the executive has to face real but limited constraints (e.g., a legislative body with more than consultative functions) and 5 means that the executive power is subject to substantial constraints (e.g., a legislature that frequently modifies or defeats executive proposals for action or rejects funds to the executive). Even values correspond to transitions between these situations.

Tabellini's assessment for the past institutions of the Spanish autonomous communities are presented in the first group of columns in Table A.4. Note that he assigns a higher value to current autonomous communities of Aragon, Catalonia and Valencian Community in the years 1600 and 1700 due to the presence of stronger legislative Courts (the *Cortes*), as opposed to those in the Crown of Castile and the equivalent body in the Kingdom of Majorca. However, the traditional perspective that considers the early modern Castilian Crown as absolutist, unconstrained and highly centralized has been strongly contested (Fernández-Albaladejo 1984; Fortea 1991; Grafe 2012; Jago 1981; Thompson 1982). These historians argued that, although Castilian *Cortes* were certainly weakened over time, the monarch was still constrained by the power of the elites of the big cities. Taxing matters were eventually negotiated directly between cities' elites separately and the monarch had no need to summon the *Cortes*. Yet, something can be said about the institutional differences across kingdoms at that time. Although the Crown of Castile should not be considered such a strong absolutist and centralized state, during the early modern age "the centralization and the tendency to absolutism are much greater than in the Crown of Aragon" (Le Flem et al. 1989, p. 185). The Castilian Crown certainly had to face important constraints in taxing policy; however, in eastern kingdoms, the *Cortes* had a much broader role. For instance, as Gil (1993) argues, "the Cortes of Aragon preserved their status as the highest legislative organ. The Cortes of Castile, in contrast, had early lost this power to the king and his Royal Council. Exclusive royal lawmaking was practically non-existent in Aragon, and if the viceroy had powers to issue pragmatics, these had to be subordinated to the higher principles established in the fueros[43]. […] the Cortes not only dealt with taxing matters […], but also with legislative issues and, by extension, political questions in general".

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[43] He is referring here to the *Fueros de Aragón*, do not confuse with municipal fueros.

Following Tabellini's methodology and starting from his assessment, we have modified the values for the levels of constraints in order to incorporate the most extended view among historians. The Crown of Castile could not be considered that centralized, unconstrained and absolutist, but the modified assessment must still capture a regional difference in terms of constraints between the Crown of Castile and the Crown of Aragon before the *Nueva Planta* Decrees. As a consequence, our assessment for the Crown of Castile is elevated from 1 to 2 in 1600 and 1700, and that of the Crown of Aragon is maintained in 3 in 1700 to express that distance argued by Gil (1993).

Table A.4. Constraints on the Executive in the Spanish Autonomous Communities, 1600-1850

Autonomous Community	Tabellini (2010)					Modified					Constraints on the exec.
	1600	1700	1750	1800	1850	1600	1700	1750	1800	1850	1600-1800
Andalusia	1	1	1	2	4	2	2	1	2	4	-0.53
Balearic Islands	1	1	1	2	4	2	2	1	2	4	-0.53
Asturias	1	1	1	2	4	2	2	1	2	4	-0.53
Cantabria	1	1	1	2	4	2	2	1	2	4	-0.53
Castile and Leon	1	1	1	2	4	2	2	1	2	4	-0.53
Castile-La Mancha	1	1	1	2	4	2	2	1	2	4	-0.53
Extremadura	1	1	1	2	4	2	2	1	2	4	-0.53
Galicia	1	1	1	2	4	2	2	1	2	4	-0.53
Canarias	1	1	1	2	4	2	2	1	2	4	-0.53
Madrid	1	1	1	2	4	2	2	1	2	4	-0.53
Murcia	1	1	1	2	4	2	2	1	2	4	-0.53
La Rioja	1	1	1	2	4	2	2	1	2	4	-0.53
Aragon	3	2	1	2	4	3	3	1	2	4	0.75
Catalonia	3	2	1	2	4	3	3	1	2	4	0.75
Valencian Comm.	3	2	1	2	4	3	3	1	2	4	0.75
Basque Country	1	1	1	2	4	3	3	3	3	4	2.88
Navarre	1	1	1	2	4	3	3	3	3	4	2.88

Additionally, Tabellini's perspective does not account for the special political situation of the Basque provinces and Navarre, which had a particular relationship with the Spanish central power. *Fuero General de Navarra*, *Fuero de Vizcaya*, *Fuero de Guipúzcoa*, and *Fueros de Álava* had to be sworn by the Monarch—just as *Fueros de Aragón*, *Furs de Valencia*, and *Constitucions de Catalunya*—and *Cortes de Navarra*, *Juntas Generales de*

Vizcaya, *Juntas Generales de Guipúzcoa*, and *Juntas Generales de Álava*, respectively, were in charge of their administration and protection. In our modified assessment, Navarre and Basque provinces have the same values as the Aragon Kingdoms in 1600 and 1700, but, since they were not affected by the Nueva Planta Decree, their situation officially remained until 1841 in Navarre and 1876 in the Basque Country. However, de-facto, central power's aspirations had been gradually eroding their autonomy from time before. For this reason, we assign to the Basque provinces and Navarre the same value as the rest of the regions in 1850.

Our variable ***Constraints on the Executive in 1600-1800*** corresponds to the principal component of these values for constraints on the executive in the years 1600, 1700, 1750, and 1800—there is no variation in 1850. The resulting variable is shown as a map in Figure 5.

Appendix 5. Convergence Analysis for 1930-1955

Table A.5 breaks down the estimation in Table 5 column 2 in three periods: 1930-1935, 1935-1940, 1940-1955.

Table A.5. Breaking down growth between 1930 and 1955

	(1)	(2)	(3)
Panel A: Second stage. Dependent:	*Growth 1930-1940*	*Growth 1935-1940*	*Growth 1940-1955*
Culture	0.177***	0.113***	0.027
	(0.05)	(0.04)	(0.02)
Std. GDP per capita lagged 5 years	-0.197***	-0.113***	-0.019
	(0.04)	(0.03)	(0.02)
_cons	0.039	-0.086***	-0.009***
	(0.03)	(0.02)	(0.01)
Panel B: First stage	*Endogenous: Culture*		
Local inclusiveness in the Middle Ages	0.728***	0.697***	0.674***
	(0.18)	(0.13)	(0.10)
Constraints on the Executive in 1600-1800	0.343***	0.349***	0.359***
	(0.10)	(0.07)	(0.05)
Std. GDP per capita lagged 5 years	0.346***	0.315***	0.278***
	(0.09)	(0.07)	(0.06)
_cons	-0.321***	-0.31***	-0.297***
	(0.11)	(0.08)	(0.06)
N	50	50	150
F-statistics	40.12	74.92	137.85
Endogeneity tests (p-value)	0.01/0.01	0.04/0.04	0.65/0.65
Overidentification test	0.56/ 0.57	0.70/0.70	0.73/0.74

Notes: Standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. Estimation method: 2SLS. Instrumental variables: ***Municipal autonomy in the Middle Ages*** and ***Constraints on the Executive in 1600-1850***. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb should be above ten (Staiger and Stock 1997). *Endogeneity tests* report the Wu-Hausman and Durbin-Wu-Hausman tests' p-value against the null that the instrumental variable is exogenous. *Overidentification tests* report Sargan and Basmann tests' p-values with the null being that instruments are valid.