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## Institutional-cultural coherence and economic development: The case of the Spanish regions

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## ABSTRACT

We explore how cultural traits coherent with liberal institutions affect economic performance. The matching between cultural traits and institutions is what we refer to as *cultural-institutional coherence*. We study how *cultural-institutional coherence* influenced the paths followed by Spanish regions after Spain's liberal reforms in the 19th century. We argue that these liberal reforms brought important changes to Spain's institutions and contributed to inducing a major rearrangement in the distribution of economic development across the country's regions. This process favored regions with cultural traits that were more coherent with liberal institutions. We address endogeneity issues using the disparate political paths that the regions followed in their distant pasts. We characterize political paths in terms of *Municipal autonomy in the Middle Ages*, as well as *Constraints on the executive* in the early modern period which, we argue, are good instruments for these cultural traits.

*“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, p. 36)

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## 1. Introduction

Certain cultural traits have been associated with better economic, social, and political outcomes. These traits are thought to foster the outcomes of liberal institutions by encouraging cooperation and participation (e.g., individual independence, self-efficacy beliefs, and generalized ethics). However, other cultural traits prevent the healthy harnessing of liberal environments (e.g., amoral familism, sectarianism, excessive verticality in human relations). We refer to this consistency between cultural traits and formal institutions as *cultural-institutional coherence*. We use this term to explain the differential 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. Today, the regions that have a larger presence of cultural traits coherent with liberal institutions are also wealthier. Prior to the liberal reforms in 19th century Spain, this was not the case. We argue that these liberal reforms triggered a significant realignment in the regional economic distribution, favoring those regions with a 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 challenges; in particular, reverse causality.<sup>1</sup> To address these challenges, we use an instrumental variable approach, relying on Spanish history to find variables that are linked to cultural traits but not directly linked to current economic performance and resort to two-stage least square (2SLS) estimation. Several empirical works have stressed the role of historical political experiences as key shapers of these cultural traits that are coherent with liberal institutions (Guiso et al., 2016, 2006; Putnam et al., 1993; Tabellini, 2010). Following these works, we show that before Spain became unified, Spanish regions followed different political paths, along at least two measurable dimensions. First, certain regions experienced more *Municipal autonomy in the Middle Ages*, allowing them to self-govern and develop legislation based on their own customs. Second, in the early modern period, *Constraints on the executive* also varied across regions. Moreover, our measures of *Municipal autonomy in the Middle Ages* and *Constraints on the executive* in the early modern period show a strong and positive correlation with current cultural traits. Therefore, our empirical analysis uses these historical political experiences as instrumental variables (IVs) for current culture traits.

The chain of events suggested here is that different regional political experiences occurring prior to the unification of modern-day Spain helped to shape different traits in local cultures. However, these cultural traits had no distinguishable effect on economic performance during the *Ancient Regime*. They only began to decisively encourage economic performance after Spain deepened the reforms towards a liberal state in the 19th century. At that point, regions with more cultural traits coherent with liberal institutions (in part due to their political experiences in the distant past) were better positioned to take 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, literacy rates, as well as a battery of geographic factors, like longitude, latitude, altitude, coast density, and the ruggedness of the terrain.

To further explore how *cultural-institutional coherence* influences regional distribution of economic performance, we also conduct a convergence analysis. The analysis reveals two key forces affecting comparative growth in GDP per capita among Spanish regions. First, we observe a catch-up effect that seems to be always active by which poorer regions tend to grow faster. Second, we observe a coherence effect, by which provinces with a higher presence of cultural traits coherent with liberal institutions grow faster during liberal periods. Prior to the 19th century liberal reforms and during the dictatorships, this coherence effect was annulled or attenuated. Thus, the convergence analysis also supports the hypothesis that *cultural-institutional coherence* plays an important role in explaining the differential effects of liberal reforms on economic performance.

To confirm our results, we perform a series of additional estimations and robustness checks. First, we test the robustness of our results using different ways of defining *Municipal autonomy in the Middle Ages*. In all cases, the results persist.

Second, many scholars have proposed different mechanisms linking 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. The regions with more balanced distributions of power were better positioned to take advantage of the new technological opportunities (i.e., industrial revolution) available during the second half of the 19th century. We show 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*. While this does not invalidate the channel stressed by Oto-Peralías and Romero-Ávila (2016), it does suggest that *cultural-institutional coherence* also plays a role.

Third, we analyze the relevance of certain regional institutional singularities that were still present after the unification. We control for: (i) the special status of the Basque Country and Navarre, which have a substantial tax autonomy; and (ii) the regionally distinctive private law components that subsisted in Galicia and the northeastern regions. In all cases, the results persist.

Fourth, using genetic information as a proxy for colonizer identity in the Christian Reconquest, we control for the effect of pre-existing cultural patterns and governance institutions spread by the colonizers. We find a substantial and significant effect of our instrument on the current distribution of income, even in presence of the colonizer identity proxy.

<sup>1</sup> While some empirical works suggest a causal link from culture to economic development (see, for example, Putnam et al. 1993, Knack and Keefer 1997, Tabellini 2010, and Guiso et al. 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).

Finally, we rebuild our cultural indicator. Once again, the results do not change.

The remainder 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 differential 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 ([Section 3.1](#)), measures to proxy cultural variation across Spanish regions ([Section 3.2](#)), and the historical instruments for culture ([Section 3.3](#)). [Section 4](#) discusses our identification strategy and presents the main results from the 2SLS estimation. [Section 5](#) performs a convergence analysis. [Section 6](#) performs several robustness checks. Finally, [Section 7](#) 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 differential 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 are highly persistent and rooted in the distant past.

### 2.1. Liberal institutions, cultural traits and economic performance

Liberal democracies are quite heterogeneous in many aspects. However, all share a common corpus of liberal institutions. They are representative democracies with open and competitive elections. They have mixed economies based on market mechanisms with a variable degree of public sector involvement. They allow broad sectors of the citizenry to participate in 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. They officially recognize universal and equal individual liberties and rights, e.g., freedom of association, freedom of expression, universal suffrage, and the right to private property. Additionally, states are structured to encourage impersonality, rule of law, equality before the law, and transparency in their procedures.

Liberal institutions (in comparison to the previous Ancient Regimen) can foster economic development in multiple ways. For instance, protecting private property rights allows investors to reap the fruits of their investments, encouraging investment in new technologies, physical capital, and human capital. This boosts creative destruction, productivity, competitiveness, and capacity accumulation ([Acemoglu et al., 2001](#); [Hall and Jones, 1999](#); [Knack and Keefer, 1995](#); [North, 1990, 1981](#); [North and Thomas, 1973](#)). Economic open access permits competition, favoring the development and expansion of more competitive products, technologies, companies, and industries ([Aghion et al., 2015](#); [Aghion and Howitt, 2006](#); [North et al., 2009](#)). Other basic rights, such as freedom of association, allow citizens to organize themselves in companies, unions, political parties and other civil associations. As a result, they can participate in the economic, political and social spheres, creating an environment ripe for the flourishing of a vibrant meso-structure of organizations that cooperate and compete to pursue individual or collective goals ([Acemoglu and Robinson, 2011](#); [North et al., 2009](#)). The division of power restricts the arbitrariness of public elites; makes economic confiscation more difficult; improves rule of law; boosts national and international government credibility; and promotes peace and political stability ([Acemoglu and Johnson, 2005](#); [Cox and Weingast, 2017](#); [North et al., 2009](#); [North and Weingast, 1989](#)). Political openness and electoral competition improve representation and accountability, preventing political capture by elites and ensuring better governance and institutions ([Acemoglu et al., 2019](#); [Acemoglu and Robinson, 2011](#); [North et al., 2009](#)). However, these institutions will not produce the same economic results across different cultural contexts. Some cultural contexts will be more coherent with liberal institutions.

Indeed, an extensive literature (especially that on social capital) explores how different cultural traits can improve or hinder functioning of markets, private organizations, public administration, and even the entire system of liberal institutions. The literature on social capital has emphasized two sets of cultural traits associated with better economic and political outcomes. First, certain cultural traits foster active participation (e.g., tolerance for individual autonomy, sense of self-efficacy, etc.). Second, other cultural traits facilitate cooperation by promoting trust and the ability to solve collective action dilemmas (e.g., civism, generalized ethics, tendency to engage in voluntary associations, interest in public affairs, etc.). For example, several empirical studies have documented that social capital (measured either as the tendency to associate or as generalized interpersonal trust) relates, *inter alia*, to overall economic growth ([Beugelsdijk and Van Schaik, 2005](#); [Guiso et al., 2006](#); [Helliwell and Putnam, 1995](#); [Knack and Keefer, 1997](#)), ease of cooperation in large organizations ([La Porta et al., 1997](#)), rate of investment ([Zak and Knack, 2001](#)), and development of financial markets ([Guiso et al., 2004](#)). Likewise, studies have found that social capital is associated with better performance of democratic institutions, through political accountability, governmental effectiveness, legislative innovation, lower levels of corruption, stronger rule of law, and the ability to overcome collective-action problems ([Bjørnskov, 2010](#); [Boix and Posner, 1998](#); [Knack, 2002](#); [Licht et al., 2007](#); [Nannicini et al., 2013](#); [Putnam et al., 1993, 1988](#); [Uslaner, 2004](#)). On the other hand, values and beliefs revolving around individual autonomy and empowerment have been also shown to relate to economic development: for instance, tolerance towards individual freedom, self-esteem, and the sense of capacity and right to participate in diverse realms of social life (academic, political, economic, artistic, etc.). Such traits can help to stimulate innovation and entrepreneurship ([Gorodnichenko and Roland, 2011](#); [Guiso et al., 2016](#); [Tabellini, 2010](#)), promote better political governance, encourage a stricter rule of law, increase accountability, and prevent corruption ([Kyriacou, 2016](#); [Licht et al., 2007](#)).

Nevertheless, for these cultural traits to make a decisive impact in aggregate terms, there must be space for participation and cooperation. In other words, an institutional framework that fails to provide for individual and associative rights and liberties (e.g., an

authoritarian regime) will benefit less from the spread of these cultural traits. Hence, our point is twofold: (i) liberal institutions function better and elicit better economic performance when these cultural traits are present; and (ii) these cultural traits can better (or only) operate to improve economic development when they are embedded in an open-access institutional system (like the liberal one). Thus, liberal institutions will induce better outcomes when they are paired with coherent cultural traits (or *vice versa*). While, in this paper, we can observe both arguments, we focus particularly on the institutional side of the institutional-cultural coherence concept, which argues that liberal institutions will have differential effects on economic development depending on the existence of a coherent cultural system. The following section presents cross-country correlations aligned with this hypothesis.

## 2.2. Correlations between cultural traits and economic performance

Finding good empirical measurements of cultural traits for different countries is complicated. We use four variables (average values for each country) from the World Values Survey (WVS), derived from the empirical literature on social capital and cultural economics.

- 1 *Association*<sup>2</sup>: Active participation in some voluntary—non-religious—organization.
- 2 *Trust*<sup>3</sup>: Generalized interpersonal trust.
- 3 *Interest in politics*<sup>4</sup>: How interested the individual is in politics.
- 4 *Action*<sup>5</sup>: Participation in alternative political actions.

For each of these variables, high values should capture a cultural environment that favors individual independence and autonomy while individuals remain oriented to collective affairs. Such environments tend to exhibit generalized interpersonal trust within the community (*trust*); are more interested in political matters (*interest in politics*, *action*); and are more capable to organize themselves, coping with the dilemmas of collective action (*association*, *action*).

Table 1 shows the correlation between GDP per capita and 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 et al., 2019), used here as a proxy for the depth of liberal institutions in each country. Polity2 is a summary index that includes metrics such as the existence of open competitive elections and the level of *Constraints on the executive's* power. This variable takes values between 10 and -10, with 10

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

Level of institutionalized liberal democracy	Correlation of per capita GDP (PPP) 2016 with			
	<i>Interest in politics</i>	<i>Trust</i>	<i>Association</i>	<i>Action</i>
Polity IV Project: Polity2 0 or below	0.1924 (14)	0.0739 (14)	0.0579 (14)	-0.2821 (10)
Polity IV Project: Polity2 from 1 to 8	0.1199 (20)	0.4027* (20)	0.1184 (20)	0.4766** (20)
Polity IV Project: Polity2 9 or above	0.6216*** (21)	0.7356*** (21)	0.4815** (21)	0.6401*** (19)
V-Dem: Liberal democracy below 0.25	0.3050 (18)	0.0068 (18)	-0.0581 (18)	-0.2927 (15)
V-Dem: Liberal democracy between 0.25 and 0.60	-0.1123 (17)	0.5892** (17)	0.0182 (17)	0.2775 (16)
V-Dem: Liberal democracy above 0.60	0.8343*** (20)	0.7541*** (20)	0.7549*** (20)	0.6523*** (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. Moreover, in certain countries (Qatar, Belarus, Uzbekistan, and Singapore), the question regarding participation in unconventional political actions is not asked. 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).

<sup>2</sup> 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?” This variable measures the percentage of people by country who report being an active member of at least one non-religious organization.

<sup>3</sup> 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 denotes the proportion of people who declare that “most people can be trusted.”

<sup>4</sup> 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 high levels imply higher interest in politics.

<sup>5</sup> From the question “... I am going to read out some forms of political action that people can take, and I would 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 report having participated at least in one of these activities.

being full democracy and -10 being autocracy. As observed in the table, these cultural variables have a higher correlation with GDP per capita and the relationship 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) and obtaining analogous results.

A tentative interpretation of the correlations in Table 1 is that liberal institutions are more able to seize communities' social capital to induce greater economic development. By contrast, 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 and social capital may improve economic development, and economic development may affect institutions and favor the accumulation of social capital. To circumvent this problem, we use a single-country case—the case of the Spanish regions—to more accurately assess the chain of events. Here, we find the necessary exogenous source of variation: the regionally distinctive historical experiences that gave rise to cultural disparities across the Spanish regions.

### 2.3. Historical roots and persistence of cultural traits

If cultural traits quickly adapted to current institutions, there would be no need to consider the independent role of cultural traits in economic performance. However, in recent decades, several empirical studies have shown that cultural traits are highly persistent, often with roots in a distant past. For example, Nunn and Wantchekon (2011) found evidence that contemporary trust in African regions is associated with past slave trade. Voigtländer and Voth (2012) showed that regional patterns of anti-Semitism in early 20th century Germany have roots in antisemitism dating back to the Middle Ages. Alesina et al. (2013) found that past agricultural practices, particularly those relating 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 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 the 19th century Austrian Partition in Poland persisted through social norms, affecting current academic performance.

Of particular interest for this paper are the empirical studies exploring 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 for the development of cultural traits that positively influence current economic performance. Giuliano and Nunn (2013) found evidence that historical democratic experiences at the local level are associated with the contemporary development of a democratic system at the national level, as well as positive attitudes towards democracy, better economic performance, and better political performance. Becker et al. (2016) investigated the long-term legacy of the “well-respected” administration of the Habsburg empire, particularly its relationship with the quality level of the current public administration and citizens' trust in local public entities. Italy, in particular, has proven a paradigmatic case for studying the role of historical local political institutions in shaping cultural traits. 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, i.e., “the belief in one's ability to complete tasks and reach goals.” Such beliefs are positively associated with cooperative spirit. In Spain's case, Soto-Oñate (2017) argued that the disparate political pasts of the Spanish regions, and particularly inclusive experiences at the local level, promoted the development of participative and cooperative cultural traits. Using this idea, Soto-Oñate (2015) presented a very preliminary analysis showing how these different cultural traits could have affected current regional income distribution.

In sum, 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, it is often possible to trace the origin of current differentials in cultural traits to diverse historical experiences in the distant past.

## 3. Data

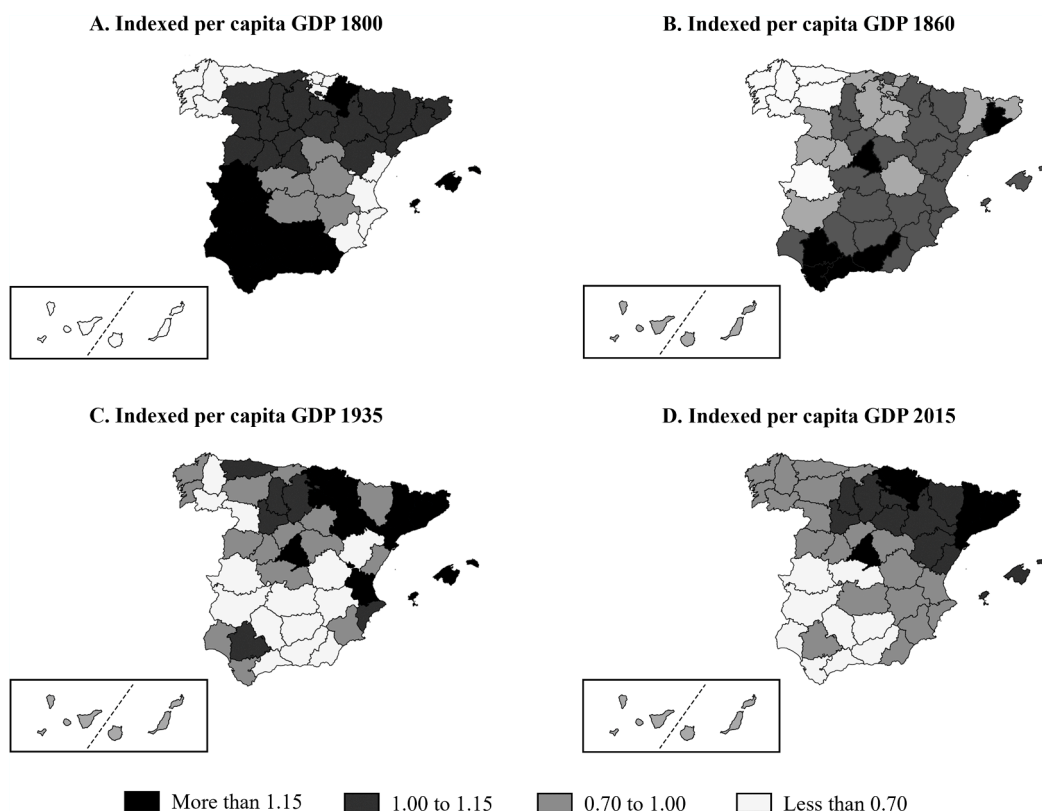
This section presents our data and provides basic descriptive statistics. Our main variables are the series of GDP per capita for the Spanish regions, a cultural index for the Spanish regions, and two historical variables that we use to instrument culture: *Municipal autonomy in the Middle Ages* and *Constraints on the executive* in 1600–1800<sup>6</sup>.

### 3.1. Distribution of economic performance across the Spanish regions

Fig. 1 depicts indexed GDP per capita for the Spanish provinces over four selected years: 1800 in Fig. 1.A, 1860 in Fig. 1.B, 1935 in Fig. 1.C, and 2015 in Fig. 1.D. Note that in 2015, the highest levels of per capita GDP were geographically concentrated in the northeastern quarter of Spain. This geographical distribution of rich and poor regions has persisted since the beginning of the 20th

<sup>6</sup> The descriptive statistics for the variables mentioned in this and the following sections can be found in Appendix A.





**Fig. 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).

century. For example, the correlation between provincial GDP per capita in 1935 and 2015 is 0.79. The period between these two years saw remarkable historical events: 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, the Euro. These events do not seem to have significantly affected the regional distribution of GDP per capita among Spanish provinces. However, the nineteenth century started with a very different distribution (Fig. 1.A). For example, Extremadura and Andalusia were among the richest regions and Basque Country, and La Rioja and Aragon were below the average<sup>7</sup> (Carreras et al., 2005). In the early twentieth century, these positions inverted, and they have remained that way.

These regional reversals of fortune<sup>8</sup> in the nineteenth century and the subsequent stability in the regional distribution of GDP per capita from the 1930s can be better appreciated in Fig. 2, which depicts the evolution of GDP per capita of the autonomous communities from 1800 to 2000. Fig. 2.A depicts autonomous communities with GDP per capita above the Spanish GDP per capita (indexed to 100) in the 1930s, while Fig. 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 regional economic distribution during the nineteenth century that concluded in the 1930s. Thereafter, the distribution remains fairly stable.

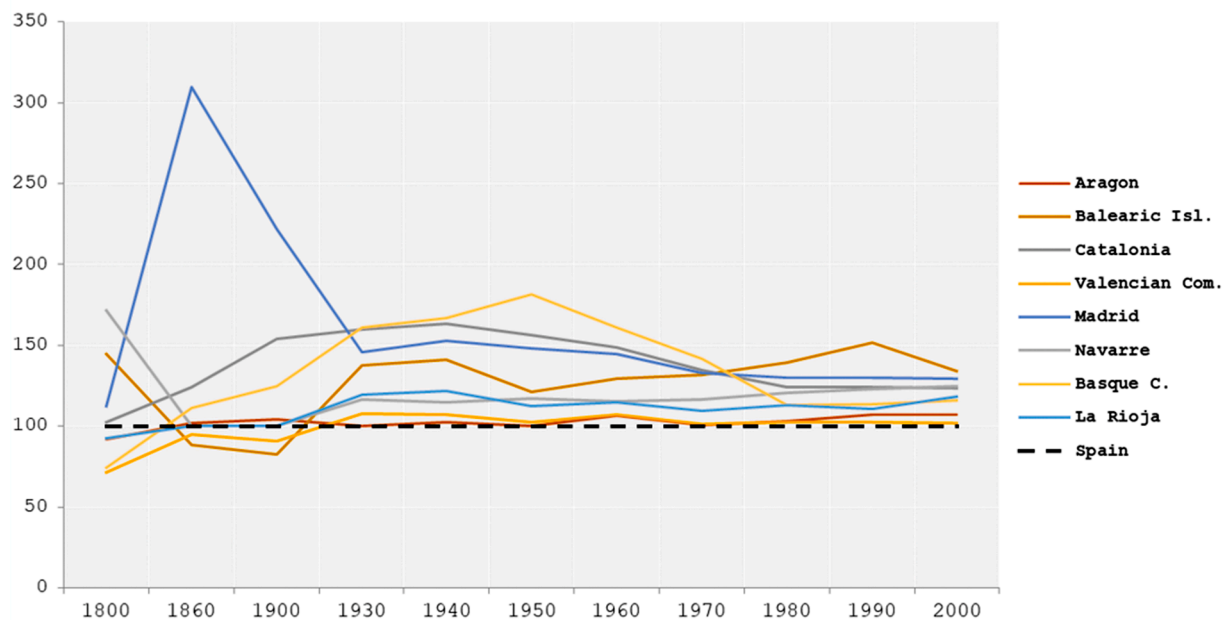
### 3.2. Distribution of cultural traits across the Spanish regions

Between 2015 and 2019, the Spanish Center of Sociological Research (CIS) conducted several individual surveys across Spain. The

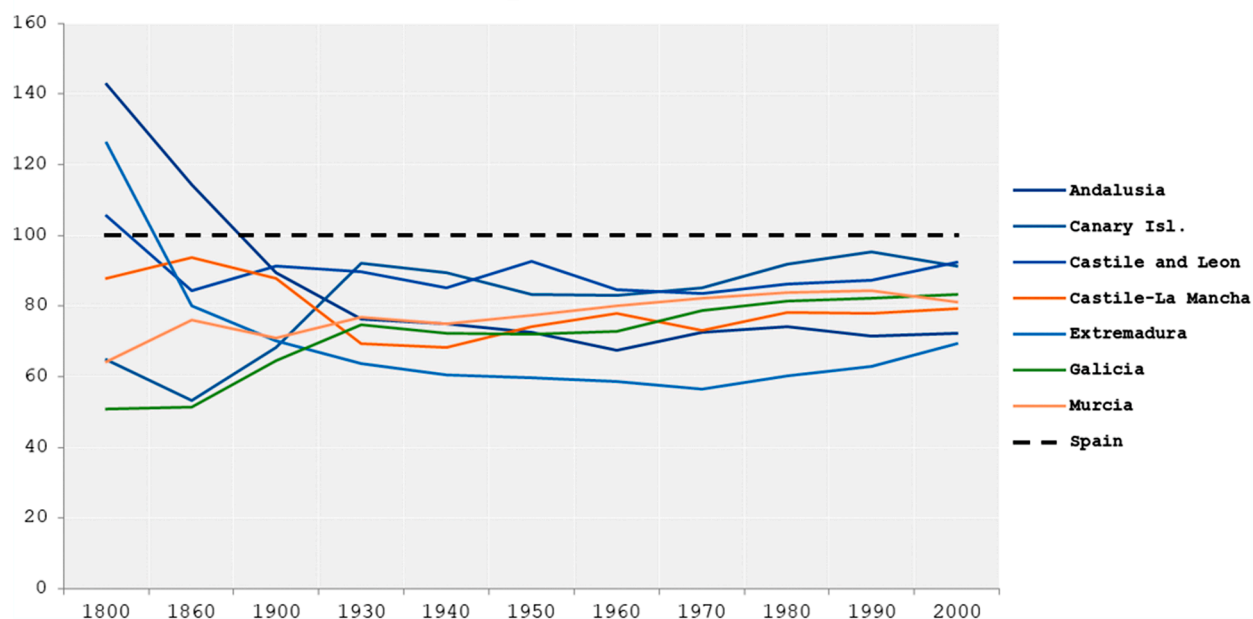
<sup>7</sup> Appendix B shows two maps with the names of the Spanish autonomous communities and provinces.

<sup>8</sup> We call it *reversal of fortune* because the previous economic regional distribution was stable for centuries before the transformations of the nineteenth century (see Appendix C).

### A. Above the Spanish average since the 1930s



### B. Below the Spanish average since the 1930s



**Fig. 2.** Evolution of indexed GDP per capita in Spanish autonomous communities 1800–2000 (Spain = 100).

Notes: Own elaboration from data contained in Carreras et al. (2005).

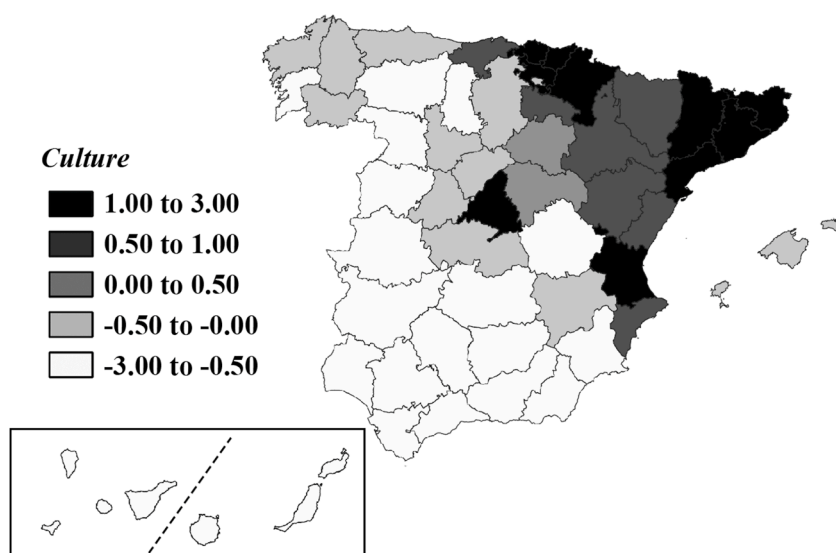


Fig. 3. Geographical distribution of the variable *Culture*.

Notes: Own elaboration from CIS data.

surveys included 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<sup>9</sup>, level of generalized interpersonal trust<sup>10</sup>, tendency to participate in voluntary civil organizations<sup>11</sup>, and habit of engaging in unconventional political actions<sup>12</sup>. The idea is that higher values of these variables indicate 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 serve as a proxy for the provincial variation of the presence of cultural traits coherent with liberal institutions. However, some of these surveys have a sample design that only allows for obtaining subnational aggregations at the autonomous community level and not at the provincial level<sup>13</sup>, which is our spatial unit of analysis. Specifically, while interest in politics can be aggregated at the provincial level, the other three variables must be aggregated at the autonomous community level<sup>14</sup>. This construction (i.e., mixing aggregates at provincial and autonomous community levels) works under the assumptions that: (i) the variables share some consubstantiality; and (ii) the true provincial variability within the autonomous communities is similar.

Fig. 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. This geographical pattern is similar to the distributions observed by other works

<sup>9</sup> From CIS (2000a, 2008a, 2011a, 2015, 2016c, 2019a, 2019b). The seven 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 being “a lot.” We take the provincial average of the individuals’ answers. The indicator corresponds to the mean of those four waves.

<sup>10</sup> From CIS (2016b, 2016c). 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?”. The options range from 1 to 10, with 1 being “You can never be too careful” and 10 being “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.

<sup>11</sup> From CIS (1998, 2000b, 2008b, 2011b, 2016b, 2016c, 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 belong to at least one organization. As in the previous case, the value of each autonomous community is imputed to their provinces.

<sup>12</sup> From CIS (2000b, 2008b, 2011b, 2016b, 2016c). The five 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 consider 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” and “participating in a strike.” The question scores as 2 for “many occasions,” as 1 for “sometime” and as 0 for “never.” A single variable is created by obtaining the principal component of the scores for these five alternative political actions. The final indicator shows the mean of the three surveys for the autonomous communities. Finally, the values are imputed to the provinces.

<sup>13</sup> Autonomous communities are administrative and political entities of a higher hierarchical level. Most autonomous communities comprise more than one province (see Appendix B).

<sup>14</sup> The value obtained for the autonomous community had been imputed to its province(s).



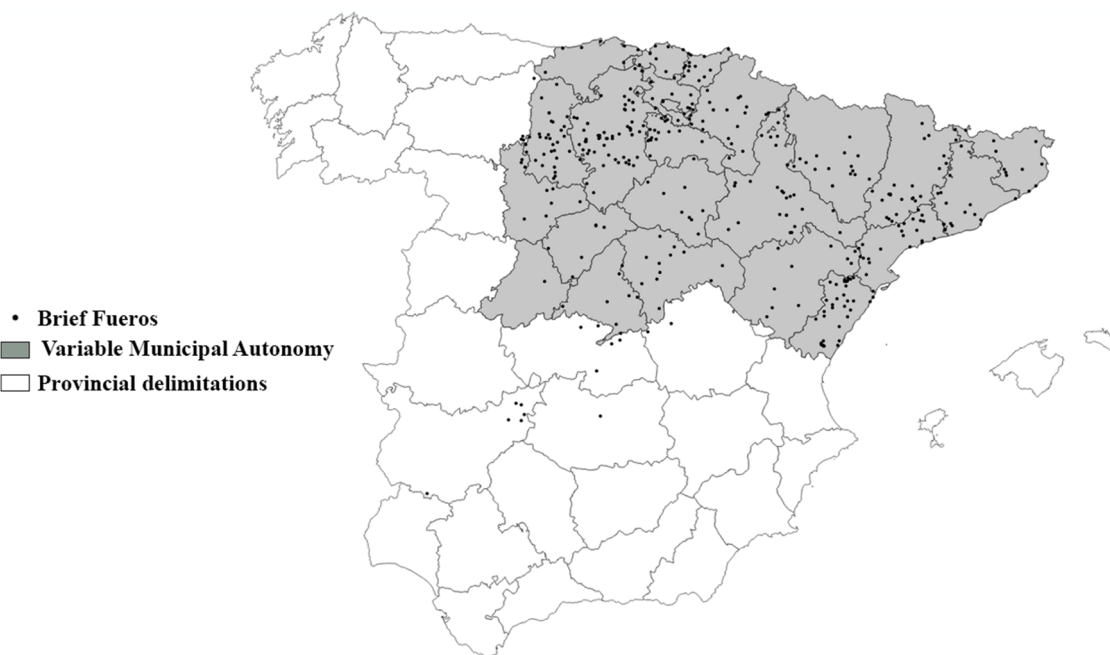
covering the Spanish regions, such as Subirats and Mota (2000) and Tabellini (2005, 2010), which also find the highest levels of related cultural traits in the northeastern quarter of Spain. [Appendix E](#) details the building of the variable *Culture* (its sources, sample sizes, sampling errors and the principal component factor analysis) and evaluates the stability of these regional cultural differences over time.

### 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, to a substantial extent, these differences persisted over centuries. Thus, the current regional variation in these cultural traits has a component originated in the different political experiences of the regions during their historical trajectories.

[Fig. 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 1 in the provinces where 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.

[Fig. 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 Tabellini 2010), but we also introduce some modifications (see Section 3.1.2 for details). Note that this variable also adopts higher values for the northeastern part of the Iberian Peninsula.



**Fig. 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 Aragón (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.



Fig. 5. Geographical Distribution of Constraints on the executive in 1600–1800.

Note: Own elaboration using Tabellini (2010).

### 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 Muslim invasion disarticulated the Visigothic Regime (5th–8th centuries) and, for centuries, the Christian elites that took shelter in the northern regions attempted to re-extend their domains toward the south. 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.

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 challenge to measure with certainty the degree of differences among regions and localize with precision the geographical delimitations of different local orders. We employ the history of Spanish medieval legislation as a reference to uncover these disparate patterns of municipal inclusiveness across regions.

Before kingdom-wide legislations were enacted in the 13th and 14th centuries, the Iberian Peninsula was covered by an enormous and heterogeneous amount of local legislative texts. These texts varied in type and name; here, for simplicity we use the most well-known designation: the *fueros*<sup>15</sup>. *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 structures (e.g., class-based rights and duties, local elites' and officials' election procedures, etc.).

The first known *fueros* appeared in the 9th century. In the early 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 was granted to the inhabitants. The *fueros* were intended to make the newly 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*). These did not sufficiently cover all the normative necessities required by daily life, and thus had to be backed by another complementary legal code or be completed at the local level in accordance with customary norms. As the Reconquest advanced to the south, the so-called *fueros extensos* (extensive *fueros*) became more and more common. Gradually, the elites of the kingdoms established more complete legal orders (of their convenience). Eventually, lengthier codes began to be imposed, with territorial scope. These lengthier codes were implemented either as complementary texts or as definitively displacing the local codes. While brief *fueros* opened the possibility (and the need) for populations to autonomously develop custom-based local legal codes, the subsequent granting of extensive *fueros* and the imposition of territorial legal codes limited or closed this possibility. We focus on the existence of brief *fueros* (without the ruling of any prevailing or complementary extensive code) to geographically demarcate the areas that enjoyed enough space to autonomously develop their

<sup>15</sup> The word '*fueros*' comes from the Latin voice *forum* and originally meant "the way in which the court must act" (García-Gallo, 1956). We also use this name to refer here to other local medieval legal texts like *cartas pueblas*, *privilegios*, *customs*, *franquesas*, *consuetudines*, and *furs*.

own legal codes.

Before lengthier codes were imposed, extensive areas of the northern Iberian Peninsula were granted only *fueros breves*. These areas thus needed to formulate their own local laws, either through the participation of a significant proportion of the population, the use of political delegates, or judicial creation of law. However, this local autonomous completion of the law occurred mainly in the north-central and northeastern parts of the Iberian Peninsula, as 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 parts of the Iberian Peninsula were not common in the northwest.

In the literature on Spanish medieval history of law, we usually find references to these differences between the northeastern systems and the rest of the 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, p. 377). In these comparatively more autonomous systems, local laws were created or formalized with the interest of the citizens in mind, and “it was never a capricious and arbitrary decision by the judge, since the people would have never accepted such a regime” (García-Gallo, 1979, p. 369). With regard to the expansion of the judicial creation of law, “it had deep roots in Castile, Navarra and Aragon” (Gacto et al., 2009, pp. 121–122). In these regions, as well as in the Basque Provinces (Gacto et al., 2009, p. 204) and Catalonia (Font Rius, 1983; García-Gallo, 1979, p. 445), custom-based legislation was also developed by local political actors.

To build a variable to capture 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 Fig. 4 indicates a location that was initially granted a *fuero breve*, without any supplementary extensive *fuero*, before the enactment of extensive kingdom-wide legal codes. This map allows us to geographically delineate the extension of this kind of local order. We create a dummy variable called *Municipal autonomy in the Middle Ages* that takes a value of 1 in the provinces where these systems were prevalent (shown in the map as the shaded area)<sup>16,17</sup>. The intuition is that places with municipal autonomy to develop their own custom-based legislation could enjoy a more inclusive municipal order. However, while autonomy certainly was a *sine qua non* condition for maintaining inclusive institutions during 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 seen in Fig. 4, the western border was the Kingdom of Leon and the southern border was the so-called Communities of Town and Land (*Comunidades de Villa y Tierra*) (as defined geographically by Martínez Díez 1983)<sup>18</sup>.

### 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 difficult 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*.

Tabellini (2010) presented 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 representing “unlimited authority” and 7 representing “accountable executive, constrained by checks and balances.” We use Tabellini’s indicator as the basis for our variable *Constraints on the executive in 1600–1800*; however, we introduce some modifications to account for some absent regional specificities (see Appendix F.2 for details).

The resulting measure is shown in Fig. 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, receives 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 constitution-like documents that had to be sworn by the Monarch. The same happened with Navarre and Basque Country, which achieve the highest values because their *foral* regime lasted longer than the Crown of Aragon’s institutions.

<sup>16</sup> 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* became prevalent. The remaining *fueros* were established by different elites from Toledo to small villages. The rest of southern Spain was replete with extensive *fueros*.

<sup>17</sup> The case of the province of *Castellón* is special. This province was rapidly reconquered and endowed with many local *fueros*; however, the king immediately 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*. It is not clear whether these specific *fueros* were brief or extensive (Romeu Alfaro, 1972). However, these municipalities were allowed to keep their special regimes, based on 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 performed in Appendix J.

<sup>18</sup> Appendix F.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.

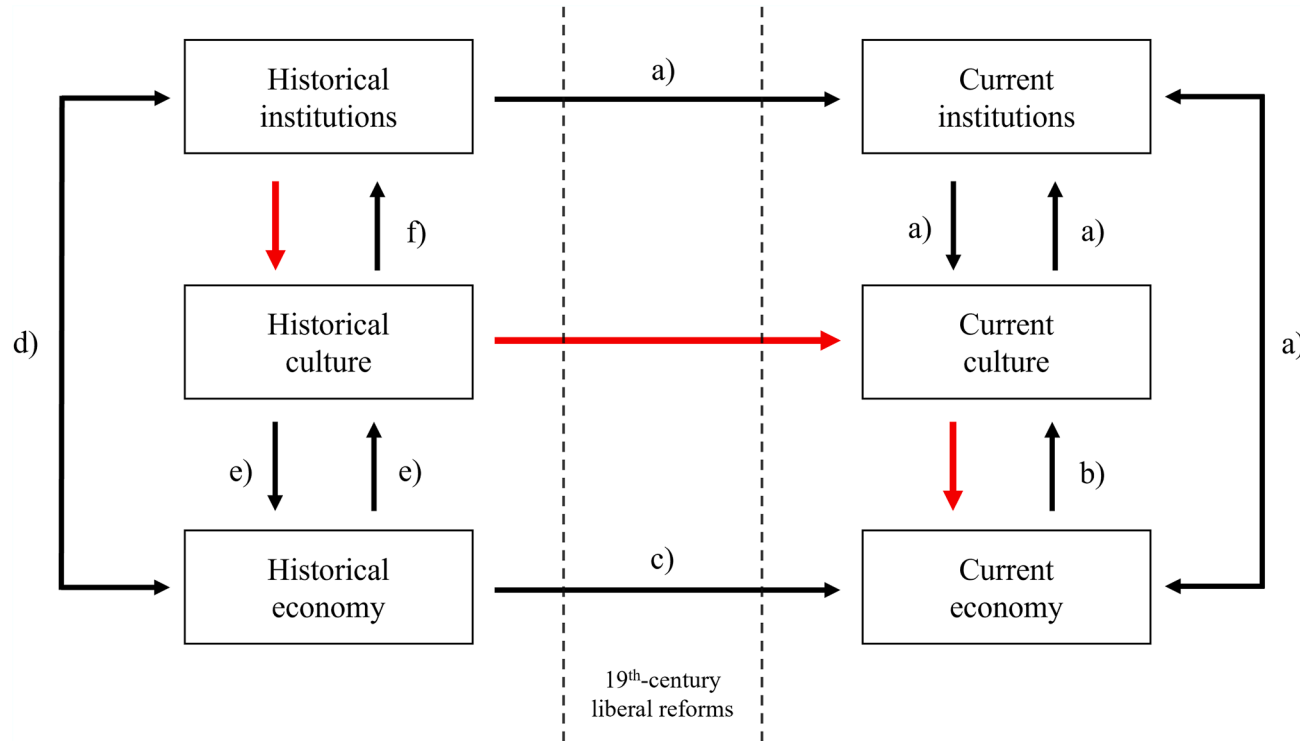


Fig. 6. Causal chart.  
Note: Adapted and simplified from Soto-Oñate (2015).

The special regime of the kingdoms of the Crown of Aragon ended with the Nueva Planta Decrees in 1707–1716, by 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 coherent with liberal institutions on the economic performance of the Spanish regions.

##### 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) prior to the unification in present-day Spain helped to develop cultural traits more coherent with liberal institutions (described in Section 3.2) which had long-lasting consequences. However, only when Spain undertook key liberal reforms (see Appendix D) did these cultural traits have a decisive impact on economic development (the evolution of the regional economic distribution is described in Section 3.1). This chain of events is indicated by the red arrows in Fig. 6 and supported by the strong correlations shown in Table 2<sup>19</sup>. Specifically, we see a strong 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 strongly correlated with both *GDP per capita in 2015* and *Culture*.

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

In Fig. 6, the difference between historical and current factors is marked by the 19th century liberal reforms. This key event opened the door for cultural traits coherent with liberal institutions to produce a differential effect on economic performance. The process through 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 the first half of the 19th century. They involved, *inter alia*, the abolishment of the seigneurial jurisdictions, the confiscation of land (*desamortización*) from the “mortmains,”<sup>20</sup> 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<sup>21</sup>.

Currently, all Spanish regions share the same liberal institutional environment. However, the regions experienced disparate political trajectories until their unification in present-day Spain. Thus, the unification of Spain is also key because it marks the end of regionally differentiated formal political institutions<sup>22</sup>. All the arrows marked with a) in Fig. 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 instrumental variables. In this way, we use the component of culture that results from 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 2**

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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[1]	<i>GDP per capita in 2015</i>	1							
[2]	<i>Culture</i>	0.808**	1						
[3]	<i>Mun. autonomy in Mid. Ages</i>	0.759**	0.715**	1					
[4]	<i>Constr. on the ex. 1600–1800</i>	0.722**	0.717**	0.499**	1				
[5]	<i>Interest in politics</i>	0.493**	0.681**	0.505**	0.287*	1			
[6]	<i>Alternative political actions</i>	0.732**	0.772**	0.605**	0.688**	0.338*	1		
[7]	<i>Trust</i>	0.488**	0.706**	0.461**	0.581**	0.226	0.493**	1	
[8]	<i>Participation in associations</i>	0.644**	0.775**	0.526**	0.530**	0.476**	0.409**	0.367**	1

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

<sup>19</sup> The variables used in this Section 4 are described in Appendix A.

<sup>20</sup> 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.

<sup>21</sup> See Appendix D for more details about the Spanish Liberal Revolution.

<sup>22</sup> 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. Although the main corpus of economic and political institutional system is now shared, some minor regional institutional differences persisted. Appendix L will deal with Basque and Navarrese tax autonomy and the persistence of private law traditions in some regions.

**Table 3**

Correlation matrix adding historical GDP per capita and historical culture.

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
[1]	<i>GDP per capita in 2015</i>	1						
[2]	<i>Culture</i>	0.808**	1					
[3]	<i>Mun. autonomy in Mid. Ages</i>	0.759**	0.715**	1				
[4]	<i>Constr. on the ex. in 1600-1800</i>	0.722**	0.717**	0.499**	1			
[5]	<i>GDP per capita in 1800</i>	-0.175	-0.072	-0.010	-0.108	1		
[6]	<i>GDP per capita in 1860</i>	0.038	0.154	0.112	0.033	0.513**	1	
[7]	<i>Culture_hat</i>	0.855**	0.827**	0.865**	0.867**	-0.068	0.083	1

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

Another concern could be that the current regional economic distribution mirrors the preexisting historical economic distribution. However, as discussed in Section 3.1 and observed in Table 3, 2015's regional economic distribution is not correlated to that of 1800 (Column 1, Row 5) nor that of 1860 (Column 1, Row 6). Therefore, Channel c) is also ruled out. The historical economic distribution is also uncorrelated with our two instrumental variables (Columns 3 and 4 with Rows 5 and 6 in Table 3), so channel d) is unlikely<sup>23</sup>.

*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. 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 to assess 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 seen in Appendix M, it is reasonable to state the institutional origin of the regional variation in cultural traits. Specifically, the Christian Reconquest established the original institutions, irrespective of colonizer culture and set the scene for differential political trajectories.

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

#### 4.2. Two-stage least square (2SLS) estimation

This phenomenon of institutional-cultural coherence can be seen from two perspectives depending on the focus. From the institutional focus, institutional-cultural coherence can be seen as how liberal institutions can elicit different results in terms of economic performance depending on the cultural context. On the other hand, from the cultural focus, it can be seen as how these cultural traits can mainly operate in the open-access space of liberal institutions. Both perspectives are covered in this section:

a. **Focus on institutions:** Spanish regions share the same general institutional system since the unification, which was progressing towards greater liberalization. However, the economic performance of liberal institutions has been uneven across Spanish regions. We show that those regions with a higher presence of cultural traits that are more coherent with liberal institutions are more able to thrive as the country liberalizes. Empirically, this suggests a comparison between the performance of the same liberal institutions operating in more and less coherent cultural contexts (i.e., a comparison in space). We address this perspective with the following regression model Eqn 1 and 2 and the resulting Table 4(A).

$$Y_i = \alpha + \beta C_i + \delta X_i + \varepsilon_i \quad (1)$$

$$C_i = \tau + \pi IV1_i + \psi IV2_i + \phi X_i + \omega_i \quad (2)$$

where  $Y_i$  is the indexed 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*.

b. **Focus on culture:** These cultural traits could not make a difference during the Ancient Regime. Only as the country deepened the liberal transformation, economic development concentrated on those regions with a higher presence of these cultural traits. Empirically, this suggests a comparison between the effects of these cultural traits on development before and after the liberal transformation (i.e., adding a comparison in time). To formally explore this, we re-estimate the previous model at different moments in time in Table 4 (B) (and extended it in Appendix H).

Table 4(A) addresses the institutional focus and reports the results of 2SLS estimations<sup>24</sup>. 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

<sup>23</sup> This has also been tested with historical regional urbanization rates (based on Bairoch et al. 1988). We can observe that 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.

<sup>24</sup> A very preliminary analysis based on 2SLS regression can be found in Soto-Oñate (2015).



**Table 4(A)**

Two-stage least square estimations.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Second stage</b>						
Dependent:			<i>GDP per capita 2015</i>			
<i>Culture</i>	0.211*** (0.02)	0.214*** (0.02)	0.202*** (0.02)	0.243*** (0.03)	0.207*** (0.02)	0.247*** (0.04)
<i>GDP per capita in 1860</i>		-0.081** (0.03)				
<i>Literacy rate in 1860</i>			0.266 (0.36)			
<i>Latitude</i>				0.001 (0.01)		0.006 (0.00)
<i>Longitude</i>				-0.008 (0.01)		0.006 (0.02)
<i>Altitude</i>				0.095 (0.06)		0.104 (0.08)
<i>Coast density</i>				0.771*** (0.20)		0.833** (0.34)
<i>Ruggedness index</i>				-0.001 (0.00)		-0.001 (0.00)
<i>Landless workers 1797</i>					-0.000 (0.00)	0.001 (0.00)
_cons	0.942*** (0.02)	1.02*** (0.04)	0.887*** (0.08)	0.844*** (0.29)	0.961*** (0.03)	0.566 (1.13)
<b>Panel B: First stage</b>						
Endogenous:			<i>Culture</i>			
<i>Municipal autonomy in Middle Ages</i>	0.949*** (0.25)	0.928*** (0.23)	0.827*** (0.18)	0.845*** (0.27)	0.919*** (0.26)	0.85*** (0.26)
<i>Constraints on the executive 1600-1800</i>	0.479*** (0.10)	0.482*** (0.10)	0.5*** (0.10)	0.364*** (0.09)	0.46*** (0.10)	0.348*** (0.08)
<i>GDP per capita in 1860</i>		0.277 (0.40)				
<i>Literacy rate in 1860</i>			1.114 (1.56)			
<i>Latitude</i>				0.049** (0.02)		0.030 (0.07)
<i>Longitude</i>				0.035 (0.02)		0.043 (0.05)
<i>Altitude</i>				-0.258 (0.20)		-0.298 (0.26)
<i>Coast density</i>				0.642 (0.69)		0.407 (1.12)
<i>Ruggedness index</i>				0.003 (0.00)		0.002 (0.00)
<i>Landless workers 1797</i>					-0.003 (0.00)	-0.003 (0.01)
_cons	-0.418** (0.11)	-0.675* (0.40)	-0.593* (0.30)	-2.222* (1.19)	-0.241 (0.19)	-1.23 (3.65)
N	50	50	50	50	50	50
Weak instruments test ( $\tau = 10\%$ , $\alpha = 5\%$ )	21.4 (15.8)	21.4 (14.4)	25.0 (17.9)	14.2 (15.7)	16.2 (16.1)	13.0 (18.0)
Endogeneity tests (p-value)	0.0027	0.0041	0.0017	0.0008	0.0031	0.0004
Overidentification test	0.7894	0.7342	0.9026	0.9221	0.7784	0.8110

Notes: Clustered standard errors at autonomous community level 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*. *Weak instruments test* is the Olea and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%: to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test* reports the Hansen J test's p-value with the null being that instruments are valid. GDP per capita 2015 and 1860 are indexed, with Spain being 1.

The OLS and reduced form regressions of these specifications can be found in [Appendix G](#).

*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. A 1 standard deviation increase in our cultural indicator would improve the indexed GDP per capita a 21.1%, which for 2015 would mean 7,042 euros more.

Columns (2)-(6) control for alternative determinants of both *Culture* and *GDP per capita in 2015*. Column (2) controls for *GDP per*

Table 4(B)

Two-stage least square estimations in selected years from 1860 to 2015.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1860	1870	1880	1890	1900	1920	1930	1950	1975	1980	2015
<b>Panel A: Second stage</b>											
Dependent:						<i>GDP per capita</i>					
<i>Culture</i>	0.03 (0.07)	0.14** (0.06)	0.23*** (0.07)	0.22** (0.09)	0.32*** (0.11)	0.28*** (0.05)	0.22*** (0.05)	0.28*** (0.06)	0.22*** (0.03)	0.23*** (0.03)	0.21*** (0.02)
_cons	0.97*** (0.07)	0.97*** (0.06)	0.97*** (0.06)	0.97*** (0.06)	0.95*** (0.06)	0.88*** (0.04)	0.88*** (0.04)	0.95*** (0.04)	0.91*** (0.02)	0.96*** (0.02)	0.94*** (0.02)
<b>Panel B: First stage</b>											
Endogenous:						<i>Culture</i>					
<i>Municipal autonomy in Middle Ages</i>	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)	0.95*** (0.25)
<i>Constraints on the executive 1600-1800</i>	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.48*** (0.10)
_cons	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)	-0.42*** (0.11)
N	50	50	50	50	50	50	50	50	50	50	50
Weak instruments test ( $\tau=10\%$ , $\alpha=5\%$ )	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)	21.4 (15.6)
Endogeneity tests (p-value)	0.6849	0.8461	0.3878	0.3336	0.3351	0.5663	0.7717	0.1220	0.0644	0.0000	0.0027
Overidentification test	0.5122	0.9065	0.4726	0.4776	0.4000	0.1787	0.2398	0.6321	0.7485	0.8443	0.7894

Notes: Clustered standard errors at autonomous community level 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*. *Weak instruments test* is the Olea and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%: to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Over-identification test* reports the Hansen J test's p-value with the null being that instruments are valid. GDP per capita is indexed, with Spain being 1.

*capita* in 1860 (data from Díez-Minguela et al. 2018, with Spain being 100), whose coefficient results insignificant in both stages. Column (3) introduces *Literacy rates in 1860*, i.e., the proportion of people who 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*. Column (4) 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 do *Altitude* and *Coast density* show a significant positive effect on *GDP per capita in 2015*. Column (5) controls for *Landless workers in 1797* (obtained from Oto-Peralías and Romero-Ávila 2016), whose coefficient results insignificant in both stages<sup>25</sup>. Column (6) adds geographical controls to the specification of Column (5), showing the robustness of previous results.

In every specification in Columns (2)–(6), *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 indicates that the effect hypothesized in the baseline specification is substantially robust.

We apply three types of tests 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, we perform the Olea and Pflueger test for 2SLS and clustered standard errors, against the null that the instruments are irrelevant in the first stage. This requirement is met for almost all the regressions in Table 4(A), showing problems when we include the battery of geographical controls. We cannot reject the null that instruments are weak at the standard and conservative parameters of  $\alpha = 5$  and  $\tau = 10\%$ , but for both columns we can reject the null at  $\tau = 10\%$ . 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 through which historical regional institutions affected current economic performance.

Following the cultural focus mentioned above, in Table 4(B), we re-estimate the model using the *GDP per capita* in different moments of history from 1860 to 2015 as dependent variables. This allows us to observe how and when the effects of institutional-cultural coherence can be statistically discerned in the distribution. While the main reforms of the liberal revolution occurred in the first half of the nineteenth century, the effects of these cultural traits on the transitioning economic distribution are expected to be perceived by these regressions only later in time, as the distribution's transformation completes. Regressions begin detecting the role of institutional-cultural coherence in the new distribution from the 1870s on, but the *Endogeneity test* does not reveal that *Culture* is also endogenous to economic development until the 1970s<sup>26,27</sup>.

In the next section, we attempt to detect the effects of *cultural-institutional coherence* in the patterns of growth from the liberal reforms. We also evaluate the changes experienced in these effects as political regimes deepen or undo the liberal transformations.

## 5. Convergence analysis: catch-up versus cultural-institutional coherence

In this section, we conduct a convergence analysis to further explore the role of cultural traits coherent with liberal institutions on regional economic distribution. Intuitively, if cultural coherence with liberal institutions was an important influence on regional distribution of economic development, the impact should be notable in the long-term evolution of growth in the regions.

Table 5 shows the average provincial GDP per capita growth by groups during certain periods from 1860 to 2015. The first panel groups the provinces by level of *Municipal autonomy in the Middle Ages* (0 and 1); the second groups them by level of *Constraints on the executive 1600–1800*; and the third groups them by *Culture* (below and over 0). The selected periods<sup>28</sup>, conditioned by the available periodicity, are:

- Column (1) shows average provincial growth within the groups for the entire period, 1860–2015.
- Column (2) evaluates growth in the period from 1860 to 1920, encompassing the last years of Queen Isabela II, the so-call *Sexenio Democrático/Revolucionario* (the six democratic/revolutionary years), and the Bourbon Restoration before the Dictatorship of Primo de Rivera. Overall, this long period, with its limitations, advances and setbacks, deepened or consolidated the liberal path.
- Column (3) refers to the period 1920–1930, which mainly corresponds to Primo de Rivera's Dictatorship (1923–1930). It signified a substantial retreat in the liberal reforms.

<sup>25</sup> Appendix K performs a further robustness check on this specification, considering *Landless workers in 1797* as endogenous and including *Rate of Reconquest* as an additional instrumental variable. This exercise attempts to discern whether our hypothesis on the chain of events remains solid once considering Oto-Peralías and Romero-Ávila's (2016) narrative.

<sup>26</sup> When these specifications are controlled for the alternative explanatory variables presented in Table 4(A) (geographic controls, Illiteracy rates and landless workers), regressions obtain similar results but with the detection of a solid and stable relationship appearing later.

<sup>27</sup> In Appendix H, we go further back in time using urbanization rates as proxies of regional economic development (since the year 1500). In it, we can see how these cultural traits (instrumented by *Municipal Autonomy in the Middle Ages*) have no significant effect on regional economic distribution until the liberal revolution of the nineteenth century. This shows that these cultural traits could not have a decisive impact on regional development until core liberal institutions were in force.

<sup>28</sup> Appendix D further details these periods and provides an indicator, the V-Dem's Liberal Democracy Index, to help us observe the critical changes in the evolution of liberal reforms and authoritarian retreats.

Table 5

Average growth by periods and groups of provinces.

	(1)	(2)	(3)	(4)	(5)	(6)
	1860-2015	1860-1920	1920-1930	1930-1940	1940-1975	1975-2015
<b>Panel A. Municipal autonomy in the Middle Ages</b>						
= 0 ( <i>n</i> = 28)	11.92	0.48	0.29	-0.22	1.73	2.13
= 1 ( <i>n</i> = 22)	12.78	0.79	0.19	-0.14	1.66	2.08
<b>Panel B. Constraints on the executive 1600-1800</b>						
= -0.53 ( <i>n</i> = 36)	11.93	0.45	0.27	-0.19	1.73	2.16
= 0.75 ( <i>n</i> = 10)	12.06	0.89	0.17	-0.21	1.70	1.94
= 2.88 ( <i>n</i> = 4)	16.21	1.46	0.17	-0.10	1.42	2.02
<b>Panel C. Culture</b>						
< 0 ( <i>n</i> = 31)	12.00	0.45	0.27	-0.19	1.73	2.19
> 0 ( <i>n</i> = 19)	12.79	0.89	0.21	-0.17	1.65	1.96

Notes: To compute the average growth, we use the indexed provincial GDP per capita found in [Díez-Minguela et al. \(2018\)](#) multiplied by national GDP per capita for the corresponding year in The Maddison Project.

- Column (4) encompasses the Second Spanish Republic (1931–1939), which was the most genuinely democratic period to that date, and the civil war (1936–1939).
- Column (5) takes the period of Franco's Dictatorship, which, like Primo de Rivera's Dictatorship, signified the dismantlement of part of the liberal state.
- Finally, Column (6) embraces the current democratic period, from Franco's death in 1975 until today.

According to our narrative, the provinces with more coherent cultural traits (and the historical instruments, i.e., municipal autonomy and *Constraints on the executive*) should have grown faster in the periods with liberal settings (Columns 2, 4, 6). The opposite should be true for periods with authoritarian counter-liberal setbacks (Columns 3 and 5).

Column (1), which encompasses the entire period, shows the comparatively greater growth in the regions with higher levels of these cultural traits and the IVs, leading to the transformation of the regional economic distribution. Columns (2) and (4) show greater average growth (or less intense de-growth in Period (4), which includes the civil war) in these provinces. The dictatorships, in columns (3) and (5), resulted in a relatively lower growth in this group of provinces. However, average growth is not greater for this group during the democratic period in Column (6). The following paragraphs will provide an explanation.

Table 6 shows the results of estimating OLS regressions of the growth rate in these periods on *Culture\_hat* (*Culture* predicted by the instruments) and the initial level of development. We use *Culture\_hat* in an OLS regression rather than resorting to a 2SLS. The reason is to avoid having to include the initial level of GDP per capita in the prediction of *Culture* in the first stage. In this way, we ensure that we are capturing the persistent and exogenous part of cultural variation attributable to historical processes. Additionally, both *Culture\_hat* and *GDP per capita* have been standardized to allow for comparisons among coefficients. In the first regression (Column 1), *Culture\_hat* has a positive and significant effect on growth, while *GDP per capita in 1860* has a significant but negative effect on growth. Thus, we observe two forces affecting the growth rate: a catch-up effect, through which poorer provinces tend to grow faster (captured by the

Table 6

Regressions of comparative growth process in different periods

	(1)	(2)	(3)	(4)	(5)	(6)
	1860-2015	1860-1920	1920-1930	1930-1940	1940-1975	1975-2015
<i>Dependent:</i>						
<i>Std. Culture_hat</i>	1.27**	0.289***	-0.004	0.082***	0.185**	0.318***
	(0.53)	(0.08)	(0.03)	(0.03)	(0.06)	(0.07)
<i>Std. GDP per capita 1860</i>	-5.146**	-0.287**				
	(1.83)	(0.12)				
<i>Std. GDP per capita 1920</i>			-0.09***			
			(0.03)			
<i>Std. GDP per capita 1930</i>				-0.093***		
				(0.02)		
<i>Std. GDP per capita 1940</i>					-0.363***	
					(0.08)	
<i>Std. GDP per capita 1975</i>						-0.498***
						(0.08)
<i>_cons</i>	12.298***	0.62***	-0.244***	-0.184***	1.696***	2.107***
	(0.82)	(0.07)	(0.05)	(0.02)	(0.05)	(0.07)
N	50	50	50	50	50	50
R <sup>2</sup>	0.5413	0.2974	0.1642	0.3141	0.4711	0.5432

Notes: Clustered standard errors at autonomous community level in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: OLS. *Culture\_hat* is the prediction of *Culture* on the instruments *Municipal autonomy in Middle Ages* and *Constraints on the executive 1600-1800*. *Culture\_hat* and *GDP per capita* have been standardized (denoted by Std.) to allow comparisons among coefficients.

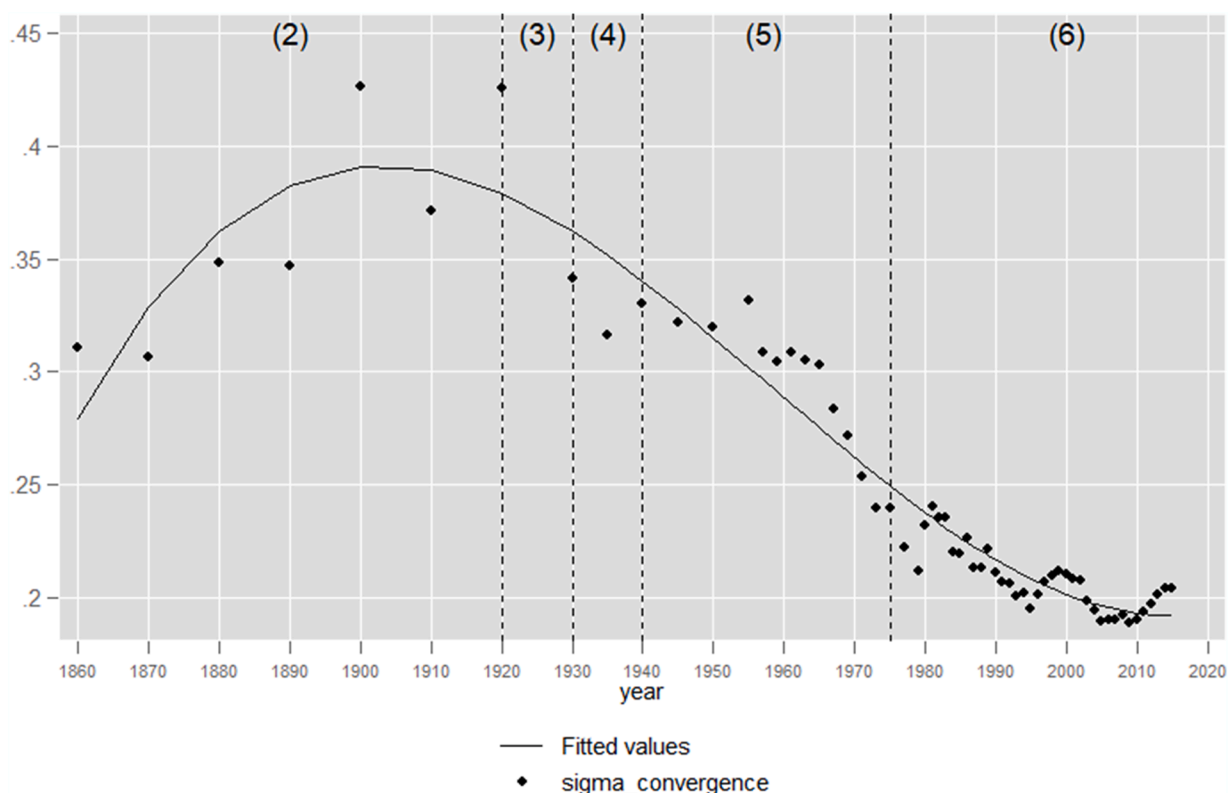


Fig. 7. Evolution of  $\sigma$ -convergence of Spanish regions 1860–2015 (Standard deviation of the provincial distribution of GDP per capita).

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.

coefficient of *GDP per capita*), and a “coherence effect,” through which provinces with a higher presence of cultural traits coherent with liberal institutions grow faster (captured by the coefficient of *Culture\_hat*)<sup>29</sup>. When we break down the analysis into the same periods in Table 5—Columns (2)–(6)—we observe that the catch-up effect is always present and the “coherence effect” is significant and strong (versus the catch-up effect), mainly in Periods (2), (4) and (6). During the Primo de Rivera’s regime, *Culture\_hat*’s coefficient is not significant. During Francoist Dictatorship, the coefficient is significant, but only represents half of the catch-up coefficient<sup>30</sup>. This is why in both periods we observe an abrupt improvement in regional convergence, as seen below in Fig. 7.

The relative weights of these two effects seem to contribute to the trajectory of comparative growth and, hence, the convergence in the regional economic distribution. Fig. 7 shows the evolution of  $\sigma$ -convergence (standard deviation of the indexed GDP per capita) from 1860 to 2015. During the realignment of the regional economic distribution before the 1930s, the evolution of  $\sigma$ -convergence was a bit messy: both components (catch-up and coherence effects) were operating to bring about the new distribution. With the retreat of liberal institutions during Primo de Rivera’s and Franco’s dictatorships, the coherence component was annulled or attenuated, allowing for a nearly net catch-up effect, which improved the regional convergence. This is particularly observable in the long Francoist period (1939–1975). 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, since 1986, was reinforced by the European structural and cohesion funds. Even with this system of interregional transferences, the coherence effect was able to shade the catch-up process.

## 6. Robustness checks and additional results

This section summarizes a series of additional tests to show the robustness of the results and the interpretations. The details are

<sup>29</sup> This phenomenon was also detected in Italy by Helliwell and Putnam (1995).

<sup>30</sup> Appendix I breaks the Francoist period into two parts to analyze separately the two segments that the conventional history of Spain regards as “Autarky” (1939–1959) and “Economic opening” (1959–1975). In the first period, both coherence effect and catch-up effect are attenuated. Later, in the economic opening of the second period, the catch-up effect is triggered, while the coherence effect remains timid under the continuation of civil and political repression.

found in the appendix.

**Appendix J** identifies three potentially contentious cases regarding the construction of *Municipal autonomy in the Middle Ages*. We build three versions of the instrument to account for alternative interpretations and repeat the baseline regression. The main results are barely altered and the overall conclusions of the research hold.

**Appendix K** takes into consideration an alternative link between the relevant historical events of the Christian Reconquest and modern regional economic distribution. It tests the robustness of our hypothesis in the presence of *Oto-Peralías and Romero-Ávila's (2016)* narrative. These events connect the Reconquest speed to the distribution of local *de facto* power, which became relevant for economic development after the industrial revolution. In a horse race 2SLS regression, we include their endogenous regressor *Landless workers 1797* and their instrument *Rate of Reconquest*. Results are again satisfactory, with our variables achieving a relevant and significant effect. As we interpret the results, culture has served as at least one of the causal channels connecting distant history and modern economic performance.

**Appendix L** analyzes the relevance of certain regional institutional singularities that were still present after the unification. Our assumption during the research was that the main institutions were unified after the Nueva Planta Decrees and the abolition of Basque and Navarre foral regimes. However, two regional particularities persisted: tax autonomy in Basque Country and Navarre and distinctive private law components. The appendix tests the robustness of our claims by introducing controls for these matters.

**Appendix M** performs an exercise at the municipal level to test the solidity of our narrative against the potential effect of colonizers' origins during the Christian Reconquest. Actors from different kingdoms were involved in the warfare. In their advance and settlement, they brought to the newly reconquered territories different peoples, institutions, and cultural patterns, which could have persisted over time and still affect the current regional economic distribution. We use genetic information to proxy the colonizers' kingdoms of origin. The appendix regresses municipal average income per capita on our instrument *Municipal autonomy in the Middle Ages* and controls for this genetic information. The results show a substantial and significant effect of our instrument in today's distribution of income, even in presence of the colonizers' identity proxy and other controls.

**Appendix N** aggregates all the cultural indicators provincially and builds again the cultural index. With this new cultural index, we repeat most of the exercises performed in the research. The overall picture is similar.

**Appendix O** introduces other controls that can also be relevant: urbanization rates, autonomous communities fixed effects and regional quality of governance index. None of these controls distorted the main results.

In sum, our main conclusions hold regardless of different constructions of the cultural index and *Municipal autonomy in the Middle Ages*, and the introduction of controls for colonizers' identity, historical land distribution, and the continuation of regional institutional particularities.

## 7. Concluding remarks

This article explores the effect of cultural traits that foster active participation and facilitate cooperation on the economic performance of liberal institutions. We use the notion of *cultural-institutional coherence* to denote consistency between cultural traits and formal institutions and apply it to the case of Spanish regions. We find that the variable *Culture*, which we use to proxy regional variation in these cultural traits, is positively related to better economic performance, but only after the liberal transformation. Moreover, this relationship is robust to other relevant geographic and socio-economic factors. We circumvent reverse causality through a two-step least square model, using as instrumental variables two proxies of inclusiveness of the regional historical trajectories from different periods (*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 differential effects on economic performance depending on the presence of coherent cultural traits. Second, coherent cultural traits produce better economic performance within liberal institutional contexts. Third, culture serves as one of the missing links connecting the Christian Reconquest of the Iberian Peninsula to the current regional economic distribution.

This paper also suggests several paths for future research. We briefly discuss four of them.

### 7.1. On data limitations

The variable *Culture* is built from several 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 et al., 2016*) or the tendency to encourage independence in children (*Tabellini, 2010*). It is also important to determine how to proxy the historical geographical distribution of these cultural traits to confirm their existence and persistence. Finally, instrumental variables with a wider graduation would also be desirable. The instrumental variable we use here to proxy *Municipal autonomy in the Middle Ages* can only distinguish two groups. It is a key distinction, since it triggered remarkably different political trajectories prior to the unification, but we cannot observe intragroup differences.

### 7.2. The cultural legacy of institutions

It remains unclear how *Municipal autonomy in the Middle Ages* specifically affected culture. For example, did the foundational origins of the new municipal social orders (more equal *de jure* and *de facto*) spark a feeling of self-esteem and competence and cooperative spirit? Or is the political experience, no matter its origin, the mechanism that fosters the development of these cultural traits? Was it the result of providing a simple space of freedom or the economic and political empowerment of the population?



### 7.3. 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. For example, regarding the connection between the Christian Reconquest and the current regional economic distribution, culture appears to be a link between past institutions and today's performance.

The cultural legacy that inclusive and extractive institutions left in the former colonies may still be influencing current economic performance and the long institutional path-dependence. While this fact does not invalidate other possible links, our results nevertheless suggest that culture has its own persistence channel and mechanisms for influencing current economic performance.

### 7.4. The importance of these cultural traits

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

## Appendix A. 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
<b>Dependent variables</b>								
<i>GDP per capita in 2015</i>	Indexed GDP per capita in 2015 (Spain=1)	Province	<a href="#">Díez-Mingueta et al. (2018)</a>	50	0.94	0.2	0.67	1.54
<i>Growth of GDP per capita</i>	Rate of growth using the indexed GDP per capita in the provinces (Díez-Mingueta et al., 2018) multiplied by Maddison Project's series of real GDP per capita for Spain	Province	<a href="#">Díez-Mingueta et al. (2018)</a> and Maddison Project ( <a href="#">Bolt et al., 2018</a> )	Depends on the analyzed period. See main text.				
<i>Urbanization rate</i>	Urbanization ratee, computed as the number of people living in cites of more than 5,000 inhabitants divided by the extension of the province	Province	<a href="#">Bairoch et al. (1988)</a>	Depends on the analyzed period. See main text.				
<b>Variables on culture</b>								
<i>Interest in politics</i>	Interest in politics	Province	<a href="#">CIS (2015, 2016c, 2019a, 2019b)</a>	50	0	1	-2.28	2.75
<i>Trust</i>	Generalized trust	Community	<a href="#">CIS (2016a, 2016b)</a>	50	0	1	-1.72	2.2
<i>Association</i>	Participation in twelve kinds of associations	Community	<a href="#">CIS (2016a, 2016b, 2019c)</a>	50	0	1	-2.34	2.09
<i>Action</i>	Participation in alternative types of political actions	Community	<a href="#">CIS (2016a, 2016b, 2019c)</a>	50	0	1	-2.46	2.74
<i>Culture</i>	First principal component from all political culture of participation indicators	Province	Own	50	0	1	-2.35	2.47
<b>Instrumental variables</b>								
<i>Municipal autonomy in the Middle Ages</i>	Local development of a custom-based legal order in the High Middle Ages	Province	Based on <a href="#">Barrero and Alonso (1989)</a>	50	22*			
<i>Constraints on the executive in 1600-1800</i>	Principal component of <i>Constraints on the executive</i> in the years 1600, 1700, 1750, 1800	Community	<a href="#">Tabellini (2010)</a> , own.	50	0	1	-0.53	2.88
<i>Rate of reconquest</i>	Rate of reconquest	Province	<a href="#">Oto-Peralías and Romero-Ávila (2016)</a>	50	7.08	5.94	0	22.53
<b>Control variables</b>								
<i>Literacy rate in 1860</i>	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
		Community	<a href="#">Carreras et al. (2005)</a>	50	1	0.3	0.51	1.71

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Table A.1 (continued)

Variable	Description	Aggregation	Source	Obs	Mean/ freq.	Std. Dev.	Min	Max
<i>GDP per capita in 1800</i>	Indexed GDP per capita in 1860 imputed to the province (Spain=1)	Province	Díez-Mingueta et al. (2018)	50	0.97	0.31	0.21	1.8
<i>GDP per capita in 1860</i>	Indexed GDP per capita in 1860 imputed to the province (Spain=1)			50	47.99	21.27	3.74	85.77
<i>Landless Workers in 1797</i>	Proportion of landowners over the population employed in agrarian activities in the province in 1797	Province	Oto-Peralfás and Romero-Ávila (2016)	50				
<i>Latitude</i>	Latitude (degrees) of the capital of the province	Province	aemet.es	50	40.1	3.16	28.2	43.5
<i>Longitude</i>	Longitude (degrees) of the capital of the province	Province	aemet.es	50	3.84	3.73	-2.82	16.25
<i>Altitude</i>	Altitude in meters of the capital of the province	Province	aemet.es	50	0.37	0.368	0.01	1.13
<i>Coast density</i>	Province's coast length divided by province area	Province	Based on INE (2003)	50	0.03	0.06	0	0.29
<i>Ruggedness</i>	Terrain Ruggedness Index	Province	Goerlich and Cantarino (2010a)	50	33.52	14.8	9.43	75.25
<b>Variables for Appendix M</b>								
<i>Average gross income per capita in the municipality in 2016</i>	Average gross income per capita in the municipality in 2016 in euros	Municipality	www.agenciatributaria.es	2817	20658.57	5598.65	11166	72993
<i>Galician cluster</i>	Area with presence of Galician genetic cluster	Municipality	Bycroft et al. (2019)	2817	290*			
<i>Asturian-Leonese cluster</i>	Area with presence of Asturian-Leonese genetic cluster	Municipality	Bycroft et al. (2019)	2817	1034*			
<i>Castilian cluster</i>	Area with presence of Castilian genetic cluster	Municipality	Bycroft et al. (2019)	2817	925*			
<i>Aragonese-Valencian cluster</i>	Area with presence of Aragonese-Valencian genetic cluster	Municipality	Bycroft et al. (2019)	2817	409*			
<i>Catalan-Majorcan cluster</i>	Area with presence of Catalan-Majorcan genetic cluster	Municipality	Bycroft et al. (2019)	2817	552*			
<i>Ruggedness</i>	Terrain Ruggedness Index of the municipality	Municipality	Goerlich and Cantarino (2010b)	2815	150.77	136.56	0.56	918
<i>Population density</i>	Number of inhabitants per hectare	Municipality	www.ign.es	2817	3.91	12.8531	0.017	215
<i>Altitude</i>	Altitude of the centroid of the municipality in meters	Municipality	www.ign.es	2817	410.88	310.308	1	1409
<i>Coast</i>	Dummy that takes value 1 if the municipality is in the coast	Municipality	www.ign.es	2817	338*			
<b>Variables for Appendix O</b>								
<i>Quality of Governance Index</i>	Average Quality of Governance Index in the region for the years 2010, 2013, 2017, 2021	Community	Charron et al. (2021)	17	-0.021	0.29	-0.37	0.66

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 B. 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

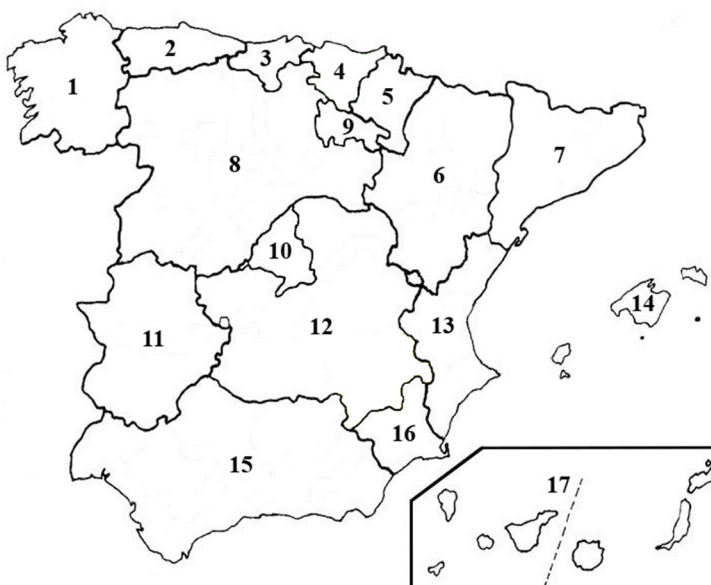


Fig. B.1. Map of Spanish autonomous communities.

### 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. Navarre    | 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             |

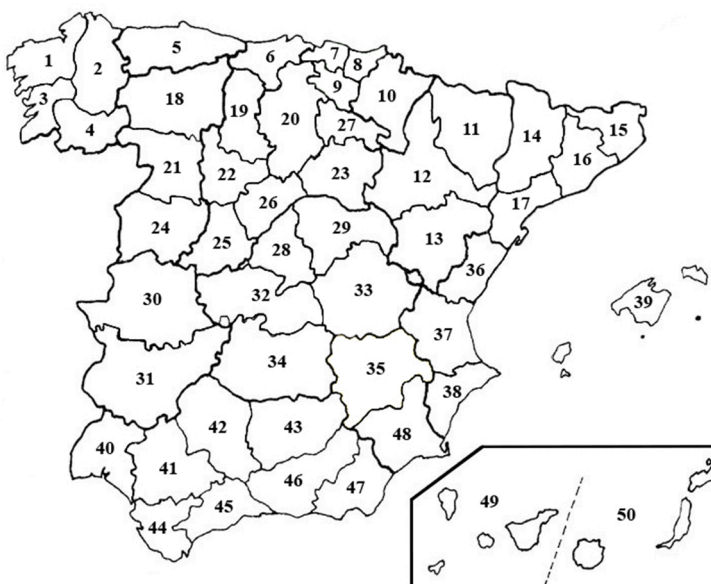


Fig. B.2. Map of Spanish provinces.

## Appendix C. Historical development in the provinces before 1860

We observe that during the 19th century through the 1930s, some sort of reorganization occurred in the geographic economic distribution and, thereafter, it remained stable. We suggest that the institutional changes in the 19th century helped trigger 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 another.

Our historical data on regional economic development (Díez-Minguela et al., 2018) begin in 1860, so we cannot observe prior to 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 income level when conventional measures are not available (Acemoglu et al., 2002; De Long and Schleifer, 1993; Dittmar, 2011). This indicator refers to the percentage of people living in cities.

**Table C.1**

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												
[2]	urban_900	0.187	1											
[3]	urban_1000	0.966**	0.158	1										
[4]	urban_1200	0.504**	0.255	0.570**	1									
[5]	urban_1300	0.332*	0.181	0.355*	0.681**	1								
[6]	urban_1400	0.305*	0.136	0.324*	0.658**	0.851**	1							
[7]	urban_1500	0.265	0.083	0.333*	0.513**	0.751**	0.653**	1						
[8]	urban_1600	0.203	0.300*	0.222	0.452**	0.527**	0.449**	0.699**	1					
[9]	urban_1700	0.198	0.115	0.197	0.299*	0.420**	0.446**	0.576**	0.795**	1				
[10]	urban_1750	0.144	0.082	0.167	0.352*	0.385**	0.422**	0.573**	0.764**	0.960**	1			
[11]	urban_1850	-0.112	0.000	0.165	0.282	0.408**	0.496**	0.468**	0.569**	0.808**	0.838**	1		
[12]	gdppc_1860	0.123	0.104	0.124	0.368**	0.578**	0.606**	0.589**	0.599**	0.753**	0.749**	0.667**	1	
[13]	gdppc_2015	-0.254	-0.062	-0.243	-0.246	-0.144	-0.234	-0.355*	-0.195	-0.053	-0.073	0.074	0.027	1

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

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, a city must have had at least 5000 inhabitants at some point between the years 800 and 1850. Given that we can locate all these cities within current provinces, we can use this information to elaborate an urbanization rate for the Spanish provinces. However, to build this urbanization rate, we 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 corresponding to the number of people living in a city of more than 5000 inhabitants divided by the extension of the province.

Table C.1 shows the correlation among the urbanization rates for all 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, prior to the 19th century, there existed a 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 mirror the historical distributions and, hence, the transformations of the 19<sup>th</sup> century were not a mere temporary disturbance.

#### Appendix D. The Spanish liberal revolution

In Spain, the institutional transformation from the Ancient Regime to the Liberal State had been brewing long before the so-called Liberal Revolution and, politically, a full and consolidated liberal democracy would not be achieved until a century and a half later. Therefore, the liberal transformations occurred during centuries with advances and setbacks, sometimes gradual and sometimes aggressive. That said, Hispanic historiography conceives as the Spanish Liberal Revolution the set of abrupt institutional transformations that occurred specifically between 1808 and 1840 (Ruiz Torres, 1994). These transformations subverted the core of the political and economic order of the Ancient Regime and managed to consolidate over time. They included, *inter alia*, the abolition of the seigniorial regime, the abandonment of absolutism, and the widening of the agricultural land market through confiscation of clerical property and abolishment of the rigid entailing system of land. Even so, the state continued to implement reforms aimed at the integration, liberalization and widening of the market. Tedde de Lorca (1994) identifies seven major changes in the social order with economic consequences:

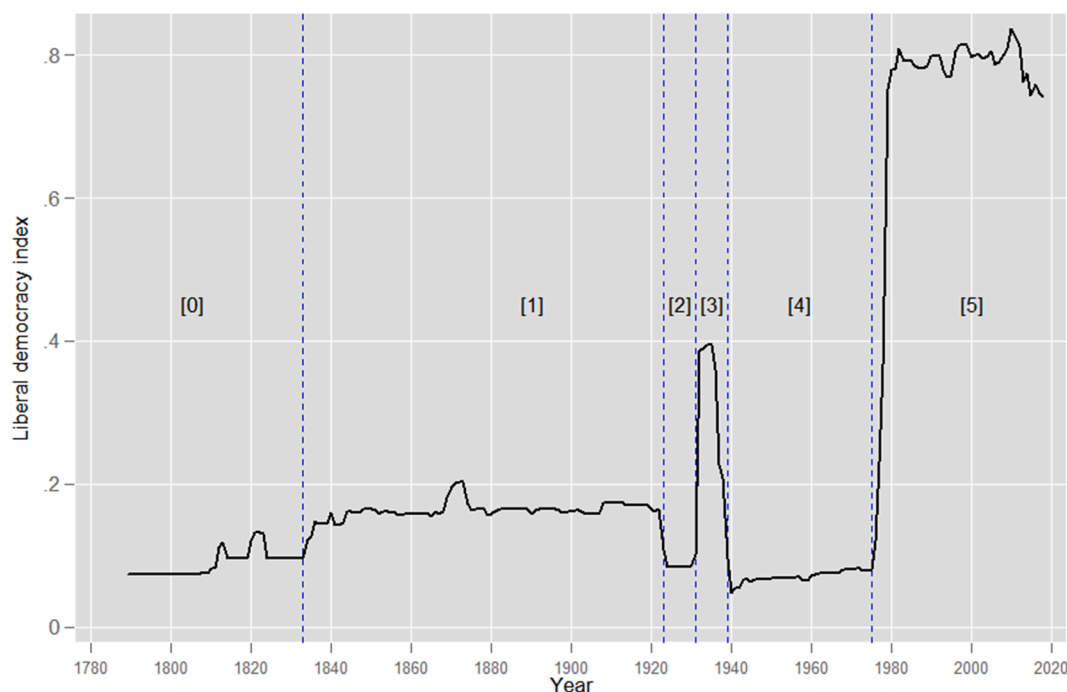


Fig. D.1. Liberal democracy index (V-Dem) from 1789 to 2018: the path to liberal democracy.

Notes: Liberal democracy index is the variable *v2x\_libdem* from Varieties of Democracy (V-Dem). The chart is divided into six parts: 1789–1837, 1837–1923, 1923–1931, 1931–1939, 1939–1975 and 1975–2018.

- 1 The principle of equality before the law
- 2 Equality before the courts of justice, with the abolition of the seignorial regime
- 3 The abolition of the tithe
- 4 The extinction of the monopolizing corporations of certain economic activities
- 5 The disappearance of the bonds that made the patrimonies of the Church and the nobility inalienable
- 6 Parliamentary control of government actions and tax revenues
- 7 The attribution to the public administrations of most of the care and teaching functions after the confiscation of clergy assets.

Fig. D.1 shows the evolution over time of the V-Dem Liberal Democracy Index indicator, which helps us observe the approximate trajectory of liberal reforms and determine the critical periods. However, this indicator accounts mainly for reforms at the political level; as such, it is an incomplete proxy for economic reforms. Still, one can distinguish critical junctures in the trajectory of the transformation. For purposes of our analysis, the figure identifies the following periods:

[0] Until 1837: Ancient Regime. The enlightened ideas had been producing timid reforms in the Spanish State towards a more rational economic administration, but without affecting the foundations of the Ancient Regime. However, there were serious attempts to dismantle the Ancient Regime and establish a liberal state prior to the 1830s, which were followed by absolutist retreats. These can be seen in the peaks of the indicator in Fig. D.1 during this period. For instance, in the final years of the War of Independence against France (1808–1814), the *Junta Central* sheltered in Cádiz convened the constituent assembly of the *Cortes of Cádiz*, which attempted to establish a liberal state under the new Constitution of 1812. However, in 1813, during the withdrawal of the French troops, Napoleon recognized Fernando VII as the King of Spain. Fernando VII then declared the *Cortes of Cádiz* and the Constitution of 1812 illegal and established an absolutist monarchy (1814–1820). After the Coup d'état of General Riego, the so-called Liberal Triennium (1820–1823) was established. It would be followed again by the invasion of Fernando VII with French troops in 1823, and the restoration of absolutism for a decade until his death in 1833. Isabella II succeeded him on the throne. Faced with the tensions of the dynastic succession, she sought support from the Liberals. This gave rise to the period of intense liberal transformations that came to be known as the “Liberal Revolution.”

[1] 1837–1923. From 1837 until the dictatorship of Primo de Rivera (which began in 1923), there was a sustained liberal period of constitutional monarchy, which was only briefly interrupted by the Six Democratic Years<sup>31</sup> (1868–1874), which temporarily raised the level of liberal deepening in this indicator, without managing to consolidate it. Between 1833 and 1837, the bulk of the most profound reforms took place. Historians take this period as a change in the social order, as mentioned above. However, as the indicator shows, liberal progress was not as revolutionary in the *political* realm as it was in the *economic* realm. This does not mean that there were no aspirations or tensions; this period, which seems stable in the indicator, was enormously turbulent, with plenty of military pronouncements, coups, civil wars, overthrows, terrorist attacks, and assassinations.

[2] 1923–1931: Dictatorships of Primo de Rivera (1923–1930) and Berenguer (1930–1931). This was an authoritarian retreat with the approval of the monarchy, which, according to the indicator, set political institutions back a century.

[3] 1931–1939: The Second Spanish Republic. The crisis of the regime pushed King Alfonso XIII to unsuccessfully rescue the previous political arrangement. When holding municipal elections in 1931 (the first elections since 1923), the anti-monarchical parties obtained such representation that the king left the country in fear of reprisals. A provisional government proclaimed the Second Spanish Republic and held elections for the constituent assembly that elaborated on and approved the new Constitution of 1931. This period meant a notable increase in the deepening of this indicator. However, after five years, a military uprising and coup d'état sparked a three-year civil war (1936–1939) that gave rise to a dictatorship of almost 40 years.

[4] 1939–1975: Franco's dictatorship. After five years of democracy, an authoritarian and autarkic system was established. Toward the second half of the dictatorship (since 1959) with the support of the US (which included Spain as its geopolitical ally against the USSR) and national technocrats, the economic policy became more orthodox, opening the economy for international trade and foreign investment. Given that the political regime remains practically intact, this indicator hardly perceives changes.

[5] 1975–now: Democratic period. After the death of Franco in 1975, Spain transitioned to a conventional liberal democracy.

In sum, two points can be noted from this appendix. First, an important institutional change occurred in the second quarter of the 19<sup>th</sup> century, which was well-documented by Spanish historiography and captured in political indexes. Second, political indexes most likely underestimate the extent of economic and social reforms that occurred during the 19<sup>th</sup> century.

## Appendix E. Measuring regional differences in relevant cultural traits

Because we lack a long series of data on regional cultures to observe culture in the past and its evolution over time, we use instrumental variables. Our assumption is that the regionally distinctive historical trajectories left a long-lasting cultural shadow that is still present today. By instrumenting current cultural differences with historical institutions, we can observe the historical component of cultural differences.

The available data on current relevant cultural traits are obtained from different surveys carried out in different years. Given that observations were so limited by region, we had to pool them to gather a substantial number of observations and elicit regional aggregates to minimize the sampling error. Section E.1 lists the surveys from which we obtained the data and the corresponding number

<sup>31</sup> Also known as the Six Revolutionary Years.



of observations.

In Section E.2, rather than pooling the observations, we build a panel and test if, with the scarce data we have, we can observe a persistent substance that could reveal a historical cultural component. That is, we need to find certain stability in the cross regional cultural differences. It compares the distribution of cultural indicators across the years and investigates the existence of a stable component over time that reveals systematic differences in these cultural traits.

### E.1. The available data

**Table E.1** displays all the CIS surveys in which these relevant cultural questions were posed and all the 50 provinces were covered. *Interest in politics* was obtained from pre-election surveys from 2000 to 2019. Participation in *alternative political actions* were asked in post-election surveys 2000, 2008, 2011, 2015 and 2016. Data for membership in voluntary non-religious *associations* were gathered from post-election surveys from 2000 to 2019 and the 1998's survey "Instituciones y autonomías (I)". *Generalized trust* was only found in the pre-election surveys of 2015 and 2016. Hence, all the data used in this paper were found in three kinds of surveys: pre-election surveys, post-election surveys, and the survey "Instituciones y autonomías (I)."

The representativeness of relevant cultural indicators at the provincial level was a major concern for this work. Only pre-election surveys, from which we obtained *interest in politics*, were designed to obtain provincial aggregations (although suffering from a sampling error of up to  $\pm 7\%$  for some cases). None of the post-election surveys (2000–2019) were designed to obtain provincial aggregations or even autonomous community aggregates. 1998's "Instituciones y autonomías (I)" does allow for aggregation at the autonomous community level, but not at the provincial level. To obtain aggregates at a confidence level of 95% and keep the sampling error below 5%, it is necessary to obtain more than 400 observations per targeted district (province or autonomous community). Under these circumstances, and being aware of the shortcomings, we pooled all the available observations for every region as if they were from the same year/survey to obtain regional aggregates and minimize error. According to Wooldridge (2016, p. 403), "by pooling random samples drawn from the same population, but at different points in time, we can get more precise estimators and test statistics

**Table E.1**

Sources for cultural indicators

Interest in politics							
Survey code	2382	2750	2915	3117	3141	3242	3263
Type	Pre-election	Pre-election	Pre-election	Pre-election	Pre-election	Pre-election	Pre-election
Year	2000	2008	2011	2015	2016	2019	2019
Q. code	P.1	P.1	P.1	P.1	P.1	P.1	P.1
Q. text	Would you say that, in general, you are very, quite, a little or not interested in politics?						
Options used	All: 1 to 4	All: 1 to 4	All: 1 to 4	All: 1 to 4	All: 1 to 4	All: 1 to 4	All: 1 to 4
Indicator	Average value mentioned in the region						
Generalized trust							
Survey code	3126	3145					
Type	Post-election	Post-election					
Year	2015	2016					
Q. code	P.71	P.68					
Q. text	Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?						
Options used	All: 0 to 10	All: 0 to 10					
Indicator	Average value mentioned in the region						
Participation in alternative organized political actions							
Type	Post-election	Post-election	Post-election	Post-election	Post-election		
Survey code	2384	2757	2920	3126	3145		
Year	2000	2008	2011	2015	2016		
Q. code	P.6	P.14	P.21	P.16	P.17		
Q. text	Have you done on many occasions, ever or never, the following actions that people take to make their opinion known about a problem ...? (only the options "participating in a demonstration", "participating in a strike" and "buying/not buying a product" are used in all the surveys)						
Options used	2, 5, 6	1, 3, 4	1, 3, 4	1, 3, 4	1, 3, 4		
Indicator	Percentage of people who have ever done any of them						
Membership in voluntary non-religious associations							
Survey code	2286	2384	2757	2920	3126	3145	3248
Type	Instituciones y autonomías (I)	Post-election	Post-election	Post-election	Post-election	Post-election	Post-election
Year	1998	2000	2008	2011	2015	2016	2019
Q. code	P.49	P.7	P.15	P.23a	P.17a	P.18a	P.10
Q. text	Do you belong or have you belonged to...?	Are you a member of (or affiliated with)? (list of organizations)					
Options used	Currently belong	Current member	Current member	Current member	Current member	Current member	Current member
Indicator	Percentage of people who is a member of at least one of them.						

**Table E.2**

Interest in politics: number of observations in surveys by province.

Year	2000	2008	2011	2015	2016	2019	2019	Total	Sampling error
Survey #	2382	2750	2915	3117	3141	3242	3263		
A Coruna	556	478	415	409	400	310	343	2911	1.82%
Alava	538	362	374	419	391	308	242	2634	1.91%
Albacete	356	269	269	252	258	255	299	1958	2.21%
Alicante	527	474	423	424	470	469	492	3279	1.71%
Almeria	380	326	267	255	320	260	299	2107	2.13%
Asturias	556	296	357	419	410	370	399	2807	1.85%
Avila	238	255	251	236	203	202	294	1679	2.39%
Badajoz	395	270	270	255	260	260	300	2010	2.19%
Baleares	474	341	351	354	369	370	398	2657	1.90%
Barcelona	1146	806	795	817	858	847	847	6116	1.25%
Burgos	382	269	269	254	260	260	299	1993	2.20%
Caceres	392	268	270	255	220	219	300	1924	2.23%
Cadiz	582	475	357	355	370	370	398	2907	1.82%
Cantabria	467	268	269	285	320	320	300	2229	2.08%
Castellon	394	270	269	283	320	317	294	2147	2.11%
Ciudad Real	394	318	265	252	219	197	300	1945	2.22%
Cordoba	525	337	267	298	319	318	352	2416	1.99%
Cuenca	320	252	255	239	205	205	299	1775	2.33%
Girona	410	358	381	426	408	297	274	2554	1.94%
Granada	474	385	353	325	370	361	398	2666	1.90%
Guadalajara	315	238	246	232	243	203	262	1739	2.35%
Guipuzcoa	672	530	384	416	409	320	287	3018	1.78%
Huelva	394	330	270	255	260	259	300	2068	2.16%
Huesca	314	254	255	240	245	239	300	1847	2.28%
Jaen	478	329	270	254	220	260	300	2111	2.13%
La Rioja	350	256	256	252	256	256	284	1910	2.24%
Las Palmas	521	405	356	356	367	365	334	2704	1.88%
Leon	380	310	270	285	320	259	298	2122	2.13%
Lleida	380	368	375	378	355	315	295	2466	1.97%
Lugo	378	268	270	255	260	258	300	1989	2.20%
Madrid	1149	748	753	791	770	730	723	5664	1.30%
Malaga	594	407	423	467	499	458	483	3331	1.70%
Murcia	520	416	419	413	464	434	482	3148	1.75%
Navarra	496	372	373	427	334	256	288	2546	1.94%
Ourense	395	302	269	252	256	220	300	1994	2.19%
Palencia	247	243	255	240	205	205	299	1694	2.38%
Pontevedra	519	355	415	380	340	310	343	2662	1.90%
Salamanca	356	267	270	254	260	220	299	1926	2.23%
Tenerife	511	326	404	375	427	400	356	2799	1.85%
Segovia	248	244	244	234	204	200	299	1673	2.40%
Sevilla	723	565	424	480	500	469	489	3650	1.62%
Soria	240	249	254	225	187	186	288	1629	2.43%
Tarragona	498	477	383	368	436	427	343	2932	1.81%
Teruel	379	288	255	240	205	205	299	1871	2.27%
Toledo	398	268	267	254	318	255	300	2060	2.16%
Valencia	737	539	425	535	516	459	532	3743	1.60%
Valladolid	388	270	268	281	320	320	298	2145	2.12%
Vizcaya	685	471	417	448	430	424	332	3207	1.73%
Zamora	316	248	249	236	202	201	293	1745	2.35%
Zaragoza	475	410	355	417	390	370	397	2814	1.85%

with more power.” We pooled observations at the provincial level for interest in politics and at the autonomous community level for the rest. Table E.2 shows the number of observations in the surveys from which we obtain interest in politics by province, and Tables E.3, E.4, and E.5 show the number of observations in the surveys from which we obtain trust, membership in associations, and participation in alternative political actions, respectively, by autonomous community.

When pooling the available data (in the way shown in Tables E.2–5), we obtain a sampling error of below  $\pm 3\%$  for interest in politics in provincial aggregates. For membership in associations, we keep the sampling error below 4% for autonomous community aggregates. Regarding participation in alternative political actions, sampling errors are generally under 5%, except for the small region of “La Rioja,” which has a sampling error of  $\pm 6.34\%$ . Generalized trust, the most iconic indicator used in social capital literature, has poorer sampling errors due to the fact that few (only two) surveys ask about it. As a result, two regions show sampling errors above 7% and one, La Rioja, has a sampling error above 10%.

**Table E.3**

Trust: number of observations in surveys by autonomous community.

Year	2015	2016	Total	Sampling error
Survey #	3126	3145		
Andalusia	1,271	1,128	2399	2.00%
Aragon	213	178	391	4.96%
Asturias	193	158	351	5.23%
Balearic Isl.	165	135	300	5.66%
Canary Isl.	300	274	574	4.09%
Cantabria	108	84	192	7.07%
Castilla and Leon	434	359	793	3.48%
Castilla-La Mancha	369	277	646	3.86%
Catalonia	711	953	1664	2.40%
Valencian Comm.	549	627	1176	2.86%
Extremadura	197	158	355	5.20%
Galicia	511	408	919	3.23%
La Rioja	47	39	86	10.57%
Comm. of Madrid	491	809	1300	2.72%
Murcia	188	178	366	5.12%
Navarre	101	84	185	7.21%
Basque Country	367	305	672	3.78%

**Table E.4**

Membership in associations: number of observations in surveys by autonomous community.

Year	1998	2000	2008	2011	2015	2016	2019	Total	Sampling error
Survey #	2286	2384	2757	2920	3126	3145	3248		
Andalusia	961	929	1,262	1,225	1,271	1,128	1,086	7862	1.11%
Aragon	500	166	263	236	213	178	170	1726	2.36%
Asturias	493	145	128	163	193	158	149	1429	2.59%
Balearic Isl.	461	105	172	137	165	135	132	1307	2.71%
Canary Isl.	525	194	356	324	300	274	264	2237	2.07%
Cantabria	444	73	99	136	108	84	80	1024	3.06%
Castilla and Leon	612	351	473	472	434	359	340	3041	1.78%
Castilla-La Mancha	535	227	292	370	369	277	264	2334	2.03%
Catalonia	911	799	694	696	711	953	914	5678	1.30%
Valencian Comm.	720	555	577	410	549	627	605	4043	1.54%
Extremadura	486	134	199	190	197	158	151	1515	2.52%
Galicia	630	385	511	525	511	408	389	3359	1.69%
La Rioja	414	35	37	81	47	39	37	690	3.73%
Comm. of Madrid	815	694	374	432	491	809	799	4414	1.48%
Murcia	487	150	190	176	188	178	174	1543	2.49%
Navarre	419	71	75	147	101	84	75	972	3.14%
Basque Country	578	270	381	362	367	305	295	2558	1.94%

**Table E.5**

Participation in alternative political actions: number of observations in surveys by autonomous community.

Year	2000	2008	2011	2015	2016	Total	Sampling error
Survey #	2384	2757	2920	3126	3145		
Andalusia	929	1262	1225	1271	1128	5815	1.29%
Aragon	166	263	236	213	178	1056	3.02%
Asturias	145	128	163	193	158	787	3.49%
Balearic Isl.	105	172	137	165	135	714	3.67%
Canary Isl.	194	356	324	300	274	1448	2.58%
Cantabria	73	99	136	108	84	500	4.38%
Castilla and Leon	351	473	472	434	359	2089	2.14%
Castilla-La Mancha	227	292	370	369	277	1535	2.50%
Catalonia	799	694	696	711	953	3853	1.58%
Valencian Comm.	555	577	410	549	627	2718	1.88%
Extremadura	134	199	190	197	158	878	3.31%
Galicia	385	511	525	511	408	2340	2.03%
La Rioja	35	37	81	47	39	239	6.34%
Comm. of Madrid	694	374	432	491	809	2800	1.85%
Murcia	150	190	176	188	178	882	3.30%
Navarre	71	75	147	101	84	478	4.48%
Basque Country	270	381	362	367	305	1685	2.39%

Table E.6

Matrix of correlations across waves within the cultural indicators.

Interest in politics (n=50)							
	2000	2008	2011	2015	2016	2019a	2019b
2000	1						
2008	0.4638***	1					
2011	0.5487***	0.5377***	1				
2015	0.4885***	0.5457***	0.5575***	1			
2016	0.5195***	0.5404***	0.6309***	0.6559***	1		
2019a	0.4281***	0.5042***	0.6636***	0.6666***	0.6399***	1	
2019b	0.4408***	0.5601***	0.6557***	0.6237***	0.6230***	0.7878***	1
Generalized trust (n=17)							
	2015	2016					
2015	1						
2016	0.6005**	1					
Participation in alternative political actions (n=17)							
	2000	2008	2011	2015	2016		
2000	1						
2008	0.4509*	1					
2011	0.519**	0.7365***	1				
2015	0.6165***	0.6805***	0.8875***	1			
2016	0.7046***	0.7675***	0.8630***	0.9378***	1		
Membership in non-religious voluntary associations (n = 17)							
	1998	2000	2008	2011	2015	2016	2019
1998	1						
2000	0.3007	1					
2008	-0.0601	-0.0597	1				
2011	0.2415	0.4173*	0.6976***	1			
2015	0.367	0.5724**	0.2654	0.7308***	1		
2016	0.5601**	0.1274	0.2381	0.4863**	0.4206*	1	
2019	0.2415	0.1695	0.0553	0.4413*	0.4975**	0.6761***	1

Notes: \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

Table E.7

Principal component factor analysis for cultural indicators across surveys.

Interest in politics					
		Factor loadings			
Variable	Factor1	Uniqueness		Factor1 scoring coefficients	
intpol_2000	0.6793	0.5386		0.15185	
intpol_2008	0.7353	0.4593		0.16438	
intpol_2011	0.8248	0.3198		0.18436	
intpol_2015	0.8151	0.3356		0.18221	
intpol_2016	0.8283	0.3139		0.18516	
intpol_2019a	0.8494	0.2786		0.18987	
intpol_2019b	0.848	0.2808		0.18957	
Eigenvalue	4.47349				
Proportion	0.6391				
Generalized trust					
		Factor loadings			
Variable	Factor1	Uniqueness		Factor1 scoring coefficients	
trust_2015	0.8946	0.1997		0.55893	
trust_2016	0.8946	0.1997		0.55893	
Eigenvalue	1.60053				
Proportion	0.8003				
Participation in alternative organized political actions					
		Factor loadings			
Variable	Factor1	Uniqueness		Factor1 scoring coefficients	
action_2000	0.73	0.4671		0.1871	
action_2008	0.826	0.3178		0.21169	
action_2011	0.919	0.1555		0.23553	
action_2015	0.9448	0.1074		0.24214	
action_2016	0.9744	0.0506		0.24973	
Eigenvalue	3.90176				
Proportion	0.7804				
Membership in voluntary non-religious associations					
		Factor loadings			
Variable	Factor1	Factor2	Factor3	Uniqueness	Factor1 scoring coefficients
assoc_1998	0.5483	-0.5433	-0.0959	0.395	0.16811
assoc_2000	0.5276	-0.2687	0.7378	0.1052	0.16174

(continued on next page)

Table E.7 (continued)

assoc_2008	0.4319	0.8408	-0.1123	0.0939	0.13241
assoc_2011	0.8587	0.4358	0.1248	0.0571	0.26327
assoc_2015	0.843	-0.0014	0.3193	0.1875	0.25843
assoc_2016	0.7581	-0.1996	-0.5207	0.1143	0.23241
assoc_2019	0.6882	-0.211	-0.3919	0.3283	0.21099
Eigenvalue	3.26181	1.34864	1.10831		
Proportion	0.466	0.1927	0.1583		

Notes: Only factors with eigenvalue  $\geq 1$  are displayed.

## E.2. Stability of regional differences in cultural indicators over time

In this section, to analyze whether there is a stable component that could be consistent with the existence of a cultural long-term substratum, we aggregate the cultural indicators by survey rather than pooling the data. The main challenge is that these aggregates are built under high sampling errors. For instance, Survey no. 2384 has 35 observations for La Rioja, which implies a sampling error of 16.5%. We aim to investigate if, even under these circumstances, we can observe evidence of a persistent component.

As a first approximation, Table E.6 shows the correlation of each cultural indicator across waves. For all the indicators except associative participation, correlation is positive and significant across surveys. This reveals a certain stability over time. However, results for associative participation are not so clear for our purposes. This could mean that either aggregate associative participation in the regions is not stable over time or that the sampling error is too large, making yearly aggregates too unreliable. More precisely, the second option means that the lack of observations and the high relative size of the sampling error compared to the real variation of average associative participation across regions might be making the distribution of this yearly indicator highly volatile across years.

Table E.7 shows the results of a principal component factor (PCF) analysis. With this more sophisticated exercise, we assess whether there exists a stable component across the surveys with which they are all positively correlated and that accounts for a substantial part of the regional variation. For interest in politics, trust and participation in alternative actions, the PCF analysis finds only one relevant component (with eigenvalue over 1) with which all years show a high and positive correlation (factor loading) and which accounts for most of the variation (proportion). The results for membership in associations are less clean but positive. There are three components, but the first one, which is distant from the other two, indicates the existence of the conditions we were looking for: positively correlated with all the surveys and accounting for a substantial part of the variation (almost 50%).

In sum we do not have a long time series, but for the available 20 years, results are consistent with the existence of a stable component. For the four cultural indicators, the first principal component reveals a time-persistent mass that accounts for a substantial part of the cross-regional variation.

## Appendix F. 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 Middle Ages* and *Constraints on the executive in 1600–1800*.

### F.1. *Municipal autonomy in the Middle Ages*

#### F.1.1. *Building an indicator of Municipal autonomy in the Middle Ages from local legal codes*

The starting point for building *Municipal autonomy in the Middle Ages* is the kind of fuero that was first granted to the local entity. Often, local entities were granted different fueros various times, either confirming, complementing, or replacing former fueros. The first map in Fig. F.1 (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 the entire 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 disappear. The third map (bottom left) removes from the second map all those places that had a territorial extensive legal code in force at the time they received their first local brief fuero (from the beginning in the Kingdom of Leon<sup>32</sup>, 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, as they are not representative of the 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.

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 prior to large fueros

<sup>32</sup> 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 definitively 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.

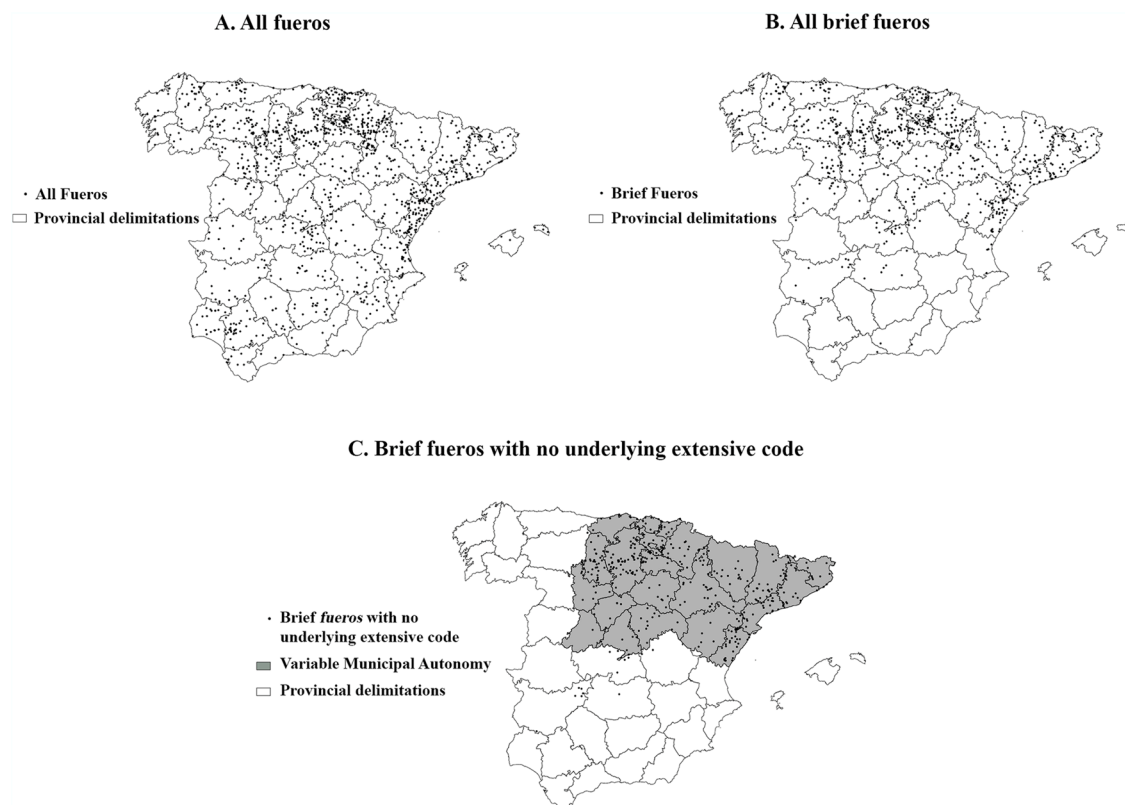


Fig. F.1. Maps with the geographical distribution of municipal fueros in the Middle Ages.

Notes: Top left map shows all the fueros contained in [Barrero and Alonso \(1989\)](#). Top right map represents the locations that first received only fueros breves. Bottom left map restricts the sample to those fueros breves that had no underlying extensive legal codes and shows (in dark) the provinces that have value 1 for the dummy variable *Municipal autonomy in the Middle Ages*.

Table F.1

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]	[2]	[3]	[4]
		<i>Culture</i>	<i>Presence of b.f.</i>	<i>Count of b.f.</i>	<i>Density of b.f.</i>
[1]	<i>Culture</i>	1			
[2]	<i>Presence of brief fueros</i>	0.7150	1		
[3]	<i>Count of brief fueros</i>	0.4848	0.6906	1	
[4]	<i>Density of brief fueros</i>	0.5747	0.6299	0.6988	1

becoming prevalent 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 fueros 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 re-conquered and granted many local fueros; however, immediately afterward, 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.

#### F.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* can 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<sup>33</sup>. Table F.1 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 (Row 2), is by far the most correlated with *Culture*.

One problem with these alternative measures is that jurisdictions were different sizes, both 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 or 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 Ávila and the Community of Town and Land of Segovia, and even included a huge proportion of the current province of Madrid. Thus, with only one case, most of the province could have been affected.

## F.2. Constraints on the executive in 1600–1800

Tabellini (2010) assesses 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 assessments for the past institutions of the Spanish autonomous communities are presented in the first group of columns in Table F.2. Note that he assigns a higher value to the 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 argue that, although Castilian *Cortes* 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 period, “the centralization and the tendency to absolutism are much greater than in the Crown of Aragon” (Le Flem, 1989). 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) 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*”<sup>34</sup>. [...] the Cortes not only dealt with taxing matters [...], but also with

**Table F.2**  
*Constraints on the executive in the Spanish autonomous communities, 1600–1850.*

Autonomous Community	Tabellini (2010)					Modified					Constraints on the exec. 1600-1800
	1600	1700	1750	1800	1850	1600	1700	1750	1800	1850	
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

<sup>33</sup> 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.

<sup>34</sup> He is referring here to the *Fueros de Aragón*. Do not confuse with municipal *fueros*.

legislative issues and, by extension, political questions in general”.

Following Tabellini's methodology and beginning with his assessment, we modify the values for the levels of constraints 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 prior to 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 the distance argued by Gil (1993).

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, the Navarre and Basque provinces have the same values as the Aragon Kingdoms in 1600 and 1700, but, because 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 for some time. 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 Fig. 5.

## Appendix G. OLS and Reduced form of Table 4(A)

**Table G.1**

OLS for Table 4(A) regressions.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent:	<i>GDP per capita 2015</i>					
<i>Culture</i>	0.165*** (0.03)	0.168*** (0.03)	0.150*** (0.03)	0.151*** (0.04)	0.153*** (0.03)	0.149*** (0.04)
<i>GDP per capita in 1860</i>		-0.058 (0.04)				
<i>Literacy rate in 1860</i>			0.495 (0.29)			
<i>Latitude</i>				0.010 (0.01)		0.006 (0.02)
<i>Longitude</i>				0.001 (0.01)		0.003 (0.01)
<i>Altitude</i>				0.092 (0.05)		0.085 (0.07)
<i>Coast density</i>				0.824*** (0.21)		0.777** (0.32)
<i>Ruggedness index</i>				0.001 (0.00)		0.000 (0.00)
<i>Landless workers 1797</i>					-0.001 (0.00)	-0.001 (0.00)
_cons	0.942*** (0.03)	0.998*** (0.05)	0.840*** (0.07)	0.464 (0.32)	1.010*** (0.05)	0.678 (1.04)
N	50	50	50	50	50	50
R <sup>2</sup>	0.6526	0.6602	0.6871	0.7045	0.6707	0.7056

Notes: Clustered standard errors at autonomous community level in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: OLS.

**Table G.2**

Reduced form of Table 4(A) regressions.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent:	<i>GDP per capita 2015</i>					
<i>Municipal autonomy in Middle Ages</i>	0.216*** (0.05)	0.218*** (0.04)	0.160*** (0.05)	0.200*** (0.05)	0.206*** (0.05)	0.200*** (0.05)
<i>Constraints on the executive 1600–1800</i>	0.093*** (0.02)	0.0931*** (0.02)	0.103*** (0.02)	0.091*** (0.02)	0.087*** (0.02)	0.092*** (0.02)
<i>GDP per capita in 1860</i>		-0.024 (0.08)				
<i>Literacy rate in 1860</i>			0.510* (0.28)			
<i>Latitude</i>				0.013*** (0.00)		0.015 (0.01)

(continued on next page)

Table G.2 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Longitude</i>				0.000 (0.00)		-0.001 (0.01)
<i>Altitude</i>				0.036 (0.04)		0.039 (0.05)
<i>Coast density</i>				0.930*** (0.13)		0.952*** (0.17)
<i>Ruggedness index</i>				-0.000 (0.00)		-0.000 (0.00)
<i>Landless workers 1797</i>					-0.001 (0.00)	0.000 (0.00)
<i>_cons</i>	0.847*** (0.03)	0.869*** (0.08)	0.767*** (0.06)	0.304 (0.18)	0.905*** (0.04)	0.213 (0.50)
N	50	50	50	50	50	50
R <sup>2</sup>	0.7322	0.7335	0.7600	0.7876	0.7436	0.7877

Notes: Clustered standard errors at autonomous community level in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: OLS.

## Appendix H. Could these cultural traits make a difference in the regional economic distribution before the liberal revolution? Results say they did not

With the exercise in Section 4.2, we test whether liberal institutions would yield different results conditioned on the existence of a coherent cultural context. In this appendix, we focus on the other side of this institutional-cultural coherence to determine whether these cultural traits better foster economic development under liberal institutions. To do so, we go further back in time analyzing regional economic distributions prior to nineteenth century's institutional transformations. We resort to urbanization rates as a proxy of economic development in the provinces, as we did in Appendix C.

Table H.1 tests how cultural traits affected the historical distribution of economic development in different years prior to the liberal

Table H.1

The role of cultural traits on development before and after the liberal revolution.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Panel A: Second stage</b>										
Dependent:	<i>urban1500</i>	<i>urban1600</i>	<i>urban1700</i>	<i>urban1750</i>	<i>urban1850</i>	<i>gdppc1860</i>	<i>gdppc1870</i>	<i>gdppc1900</i>	<i>gdppc1950</i>	<i>gdppc2015</i>
<i>Culture</i>	-0.88** (0.40)	-1.15 (0.75)	-0.72 (0.81)	-1.17 (1.00)	-1.47 (2.18)	0.05 (0.06)	0.14*** (0.05)	0.28*** (0.07)	0.27*** (0.05)	0.22*** (0.02)
<i>_cons</i>	1.87*** (0.29)	3.5*** (0.53)	2.87*** (0.54)	3.56*** (0.67)	9.08*** (1.46)	0.97*** (0.04)	0.97*** (0.04)	0.95*** (0.05)	0.95*** (0.03)	0.94*** (0.02)
<b>Panel B: First stage</b>										
Endogenous:	<i>Culture</i>									
<i>Municipal autonomy in Middle Ages</i>	1.39*** (0.21)	1.39*** (0.21)	1.39*** (0.21)	1.39*** (0.21)	1.39*** (0.21)	1.43*** (0.21)	1.43*** (0.21)	1.43*** (0.21)	1.43*** (0.21)	1.43*** (0.21)
<i>_cons</i>	-0.59*** (0.12)	-0.59*** (0.12)	-0.59*** (0.12)	-0.59*** (0.12)	-0.59*** (0.12)	-0.63*** (0.11)	-0.63*** (0.11)	-0.63*** (0.11)	-0.63*** (0.11)	-0.63*** (0.11)
N	48	48	48	48	48	50	50	50	50	50
F-statistic	42.95	42.95	42.95	42.95	42.95	46.73	46.73	46.73	46.73	46.73
Endogeneity tests (p-value)	0.48/0.49	0.06/0.05	0.03/0.02	0.02/0.01	0.01/0.00	0.98/0.98	0.73/0.73	0.81/0.82	0.26/0.24	0.02/0.00

Notes: Robust standard errors in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: 2SLS. Instrumental variable: *Municipal autonomy in the Middle Ages*. *Urban* refers to the urbanization rate in the province at the indicated year and *gdppc* refers to the indexed GDP per capita, with Spain being 1. *F-statistics* is F-test against the null that the instruments are irrelevant in the first stage: as a rule of thumb it should be above 10 (Staiger and Stock 1997). *Endogeneity tests* report the p-value of the Wooldridge score test and the robust regression-based test against the null that the instrumental variable is exogenous.

**Table H.2**

The role of cultural traits on development before and after the liberal revolution: controlling for geography, illiteracy and landless workers.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Panel A: Second stage</b>										
Dependent:	<i>urban1500</i>	<i>urban1600</i>	<i>urban1700</i>	<i>urban1750</i>	<i>urban1850</i>	<i>gdppc1860</i>	<i>gdppc1870</i>	<i>gdppc1900</i>	<i>gdppc1950</i>	<i>gdppc2015</i>
<i>Culture</i>	-0.14 (1.25)	-2.93 (0.29)	-0.98 (1.33)	-1.57 (1.78)	-5.14 (4.50)	-0.01 (0.08)	0.05 (0.07)	0.16 (0.10)	0.19*** (0.07)	0.23*** (0.06)
<i>_cons</i>	23.39** (9.90)	17.54 (25.4)	50.13*** (19.14)	60.96*** (22.07)	127.99** (59.8)	2.68** (1.07)	2.90*** (0.98)	1.97 (1.43)	0.46 (0.91)	0.65 (1.05)
<b>Panel B: First stage</b>										
Endogenous:	<i>Culture</i>									
<i>Municipal autonomy in Middle Ages</i>	0.62** (0.25)	0.62** (0.25)	0.62** (0.25)	0.62** (0.25)	0.62** (0.25)	0.87*** (0.21)	0.87*** (0.21)	0.87*** (0.21)	0.87*** (0.21)	0.87*** (0.21)
<i>_cons</i>	-1.67 (3.80)	-1.67 (3.80)	-1.67 (3.80)	-1.67 (3.80)	-1.67 (3.80)	2.86 (3.58)	2.88 (3.58)	2.86 (3.58)	2.86 (3.58)	2.86 (3.58)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	48	48	48	48	48	50	50	50	50	50
F-statistic	59.97	59.97	59.97	59.97	59.97	48.86	48.86	48.86	48.86	48.86
Endogeneity tests (p-value)	0.98/0.98	0.02/0.02	0.05/0.06	0.06/0.07	0.04/0.07	0.24/0.30	0.23/0.29	0.74/0.77	0.24/0.30	0.02/0.02

Notes: Robust standard errors in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: 2SLS. Instrumental variable: *Municipal autonomy in the Middle Ages*. *Urban* refers to the urbanization rate in the province at the indicated year and *gdppc* refers to the indexed GDP per capita, with Spain being 1. *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 10 (Staiger and Stock 1997). *Endogeneity tests* report the p-value of the Wooldridge score test and the robust regression-based test against the null that the instrumental variable is exogenous. All the regressions are controlled by geographic variables, *Illiteracy rate in 1860* and *Landless workers in 1860*.

revolution (using urbanization rates from 1500 to 1800) and after the liberal revolution (using GDP per capita from 1860 to 2015)<sup>35</sup>. It shows that, prior to the liberal revolution, these cultural traits had no effect on comparative economic development (or even a negative relation). Only after the liberal revolution did the distribution of cultural traits begin to have a positive and significant role on the economic distribution.

Hence, under the institutions of the *Ancient Regime*, these cultural traits were not able to operate (at least fully) to bring about economic prosperity. The liberal transformation changed that. This shows another implication of the particular relationship that these cultural traits have with liberal institutions. These cultural traits require institutionally-backed space and mechanisms of the liberal system to powerfully affect economic development (Table H.2).

## Appendix I. Comparative growth in the two Francoist periods

In this appendix, the Francoist period is broken down into two periods to analyze separately the two parts that the conventional history of Spain regards as “Autarky” (1939–1959) and “Economic opening” (1959–1975), respectively. Table I.1 repeats the exercise of Table 6 for these two periods. The results are not as categorical as for the rest of the periods considered. We see that in both Francoist periods, *Culture*’s coefficient remains significant but attenuated. Beforehand, and after seeing what happened during the Primo de Rivera’s Dictatorship period, our intuition would be that *Culture*’s coefficient should turn non-significant. However, the results need a less straightforward explanation. In the first period, under this autarkic and state-commanded economy, neither the catch-up effect nor the coherence effect could operate (and that is why both coefficients are reduced and  $R^2$  is low). Only when the so-called opening of the Francoist economy began (allowing international trade and foreign direct investment, liberalizing domestic markets, forcing fiscal discipline, etc.) was the catch-up effect triggered. However, the coherence effect remained timid under civil and political repression. That is why *Culture*’s coefficient remains comparatively small in size (versus the catch-up effect) and almost loses its significance (as comparative growth is now driven by the catch-up effect), which boosted the convergence process in the regional economic distribution.

<sup>35</sup> Given that the years we use start in 1500 (before our variable *Constraints on the Executive* could have an impact on culture), we use only *Municipal Autonomy in the Middle Ages* as an instrument. And given that there is only one instrument, the overidentification test is not displayed.

**Table I.1**  
Regional comparative growth in the two Francoist periods.

	(1) 1940-1959	(2) 1959-1975
Dependent:	<i>Growth of GDP per capita</i>	
<i>Std. Culture_hat</i>	0.08** (0.03)	0.07* (0.03)
<i>Std. GDP per capita 1940</i>	-0.09*** (0.03)	
<i>Std. GDP per capita 1959</i>		-0.19*** (0.04)
_cons	0.30*** (0.02)	1.07*** (0.03)
N	50	50
R <sup>2</sup>	0.2291	0.4022

Notes: Clustered standard errors at autonomous community level in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: OLS. *Culture\_hat* is the prediction of *Culture* on the instruments *municipal autonomy in Middle Ages* and *Constraints on the executive 1600-1800*. *Culture\_hat* and *GPD per capita* have been standardized (denoted by Std.) to allow for comparison with other coefficients.

## Appendix J. Alternative constructions 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 J.1 re-estimates the baseline 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 cases is not critical for our results.

**Table J.1**  
Potentially contentious cases regarding the definition of *Municipal autonomy in the Middle Ages*.

	(1)	(2)	(3)	(4)
<b>Panel A: Second stage</b>				
Dependent:	<i>GDP per capita</i>			
<i>Culture</i>	0.211*** (0.02)	0.215*** (0.02)	0.211*** (0.02)	0.205*** (0.03)
_cons	0.942*** (0.02)	0.942*** (0.02)	0.942*** (0.02)	0.942*** (0.24)
<b>Panel B: First stage</b>				
Endogenous:	<i>Culture</i>			
<i>Municipal autonomy in the Middle Ages (baseline)</i>	0.949*** (0.25)			
<i>Municipal autonomy in the Middle Ages (without Castellon)</i>		0.899*** (0.25)		
<i>Municipal autonomy in the Middle Ages (with Leonese extremadura)</i>			0.832*** (0.24)	
<i>Municipal autonomy in the Middle Ages (with southern fueros breves)</i>				0.754*** (0.22)
<i>Constraints on the executive in 1600-1800</i>	0.479*** (0.10)	0.505*** (0.10)	0.526*** (0.10)	0.560*** (0.10)
_cons	-0.418** (0.11)	-0.377*** (0.11)	-0.399*** (0.12)	-0.392*** (0.12)
N	50	50	50	50
Weak instruments test ( $\tau=10\%$ , $\alpha=5\%$ )	21.4 (15.8)	18.8 (14.3)	17.9 (15.5)	23.0 (11.6)
Endogeneity tests (p-value)	0.0027	0.0022	0.0044	0.0162
Overidentification test	0.7894	0.6759	0.7623	0.9780

Notes: 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*. *Weak instruments test* is the Olea and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%: to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test* reports the Hansen J test's p-value with the null being that instruments are valid. GDP per capita 2015 and 1860 are indexed, with Spain being 1.

There are three potentially contentious cases:

### 1 Province of Castellon

The case of the province of Castellon is special. This province was rapidly re-conquered and granted with local *fueros*; however, immediately afterward, the king enacted a kingdom-wide extensive code denoted *Furs de Valencia*. Only 25 years passed from the establishment of the first local *fuego* 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 that in our baseline definition, *Municipal autonomy in the Middle Ages* adopts value 1 for this province. Changing this classification, however, barely affects the results, as can be observed in Column (2).

### 1 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. Some councils in the so-called *Leonese extremadura* were allowed to elaborate on their municipal codes 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.

### 1 Brief *fueros* at the south of the “Town and Land Communities”

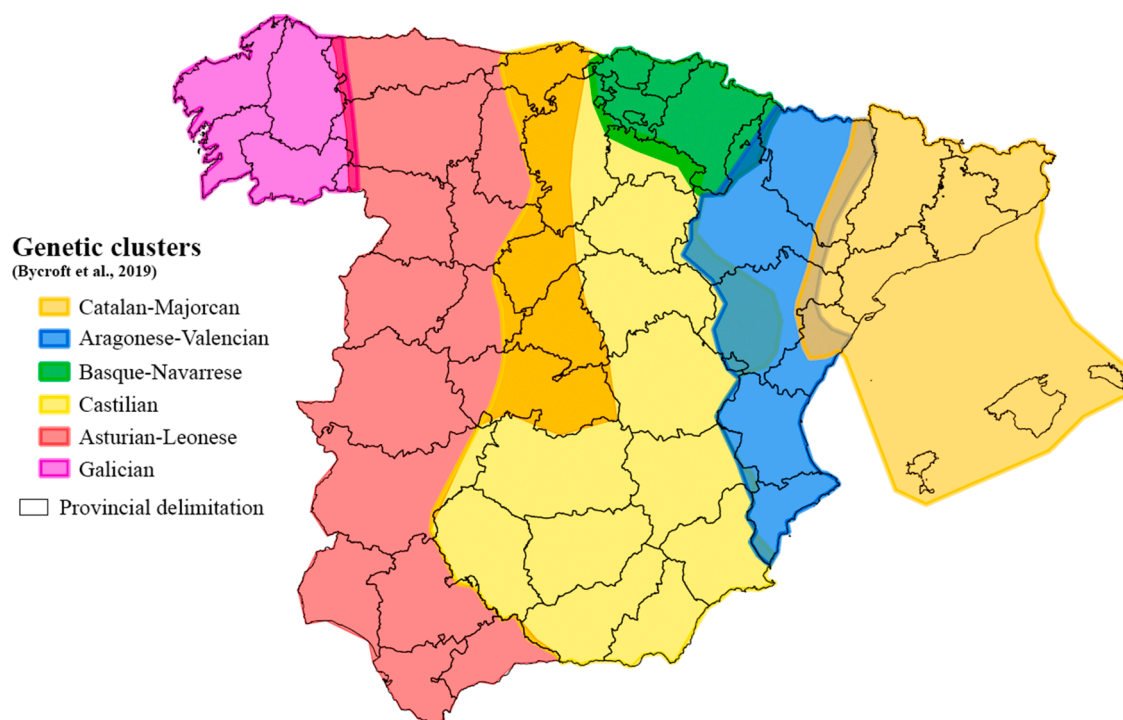
Some southern provinces beyond the “Town and Land Communities” had a few cases of brief *fueros*, but we have classified them as provinces in the area with no *Municipal autonomy in the Middle Ages*. Three of these *fueros* were granted by Alfonso VII. After his reign, the policy of extensive *fueros* 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.

## Appendix K. Alternative or simultaneous missing link between relevant historical events and modern performance: material social structure

Several empirical studies have documented the relationship between historical experiences in the distant past and current economic and political outcomes (see, for example, the works cited in Section 2.3). The exact mechanisms connecting 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, defend 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 studying 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) suggest 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 better positioned to take advantage of the new available technological opportunities of the industrial revolution 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 made it persist until the present time. Their interpretation of modern disparities of economic development is essentially focused on the local use of political power and the unequal distribution of economic resources and their explanation of the



**Fig. K.1.** Genetic clusters in the Iberian Peninsula.

Source: Own elaboration following Bycroft et al. (2019).

**Table K.1**

Missing link between history and modern performance.

	(1)	(2)		
<b>Panel A: Second stage</b>				
Dependent:	<i>GDP per capita 2015</i>	<i>GDP per capita 2015</i>		
<i>Culture</i>	0.171*** (0.02)	0.272*** (0.05)		
<i>Landless workers 1797</i>	-0.001 (0.00)	0.016 (0.01)		
<i>_cons</i>	0.993*** (0.09)	-4.281 (3.31)		
<b>Panel B: First stage</b>				
Endogenous:	<i>Culture</i>	<i>Landless workers 1797</i>	<i>Culture</i>	<i>Landless workers 1797</i>
<i>Municipal autonomy in Middle Ages</i>	0.678** (0.28)	0.471 (5.64)	0.654** (0.31)	2.279 (4.78)
<i>Constraints on the executive 1600-1800</i>	0.634*** (0.16)	1.613 (3.12)	0.48*** (0.13)	-3.991 (3.13)
<i>Rate of reconquest</i>	-0.034* (0.02)	2.206*** (0.49)	-0.049** (0.24)	0.819* (0.48)
<i>_cons</i>	-0.53 (0.34)	34.43*** (6.43)	0.473 (1.24)	274.39*** (36.58)
N	45		45	
Geographic controls	No		Yes	
Endogeneity test (p-value)	0.1738		0.0010	
Overidentification test	0.1798		0.7879	

Notes: Clustered 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*. Geographical controls are: *Latitude*, *longitude*, *altitude*, *coast density* and *ruggedness index*. We do not report any test for weak instruments because we do not know of any test for a 2SLS with more than one endogenous regressor and clustered standard errors. Endogeneity test reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. Overidentification test reports the Hansen J test's p-value with the null being that instruments are valid.

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.<sup>36</sup> By 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).

To explore the role played by the mechanism stressed by Oto-Peralías and Romero-Ávila (2016) and ours, Table K.1—Column (1)—repeats the regression in Column (1) of Table 4(A), 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<sup>37</sup>. *Landless workers in 1797* is recognized as an endogenous variable 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 re-conquered, which has presumably affected the possibility of a more complete and balanced re-population occurring. Higher speed is associated with a higher concentration of economic and political power<sup>38</sup>. In the first stage of Column (1), *Rate of reconquest* has a slightly significant negative effect on *Culture*, but it is the only variable that significantly affects *Landless workers in 1797*. In the second stage, only *Culture* shows a significant effect on the regional distribution of economic performance. Column (2) includes geographic controls, obtaining similar fundamental results. 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*<sup>39</sup>. 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). The reason is that culture and material inequality are tightly linked. The effect of inequality on economic performance under liberal institutions might be hidden due to the presence of our variable. Further research could explore the different links through which history affects modern regional performance.

## Appendix L. Continuation of institutional singularities: civil code in northern regions and tax autonomy in Basque country and Navarre

### L.1. Tax autonomy of 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 determine, collect and manage their own taxes and establish their contributions to the Spanish public budget. The remaining autonomous communities are integrated into 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 L.1, we repeat the basic regression in Table 4(A), 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. These results hold in Column (2), which includes geographical controls<sup>40</sup>. Thus, our results persist once we control for the tax autonomy of the Basque Country and Navarre.

### L.2. The continuation of private law particularities in northern regions

In terms of private law, the Civil Code (*Código Civil*) has ruled as a common regime for all of Spain since 1888. However, some regions have preserved substantial idiosyncrasy in private matters (marriage, inheritance, contracts, taxes, etc.), revealing a distinctive traditional private law. With the recent arrival of democracy and the federal regime of autonomous communities, Spain allowed the formal codification of those customary particularities that remained rooted in the population of these regions for centuries. Column (3) of Table L.1 controls for a dummy called *Castilian private law* that takes value 1 for those regions ruled by the common regime of the Civil Code<sup>41</sup>. In the first stage, our IVs are highly significant and *Castilian private law* is not. In the second stage, *Culture*’s coefficient remains significant and not far in size to the coefficient in the baseline model. Column (4) includes additional geographic controls, obtaining similar results.

<sup>36</sup> Only at the end of their conclusion, they briefly mention that cultural features could have been generated by this distribution of power.

<sup>37</sup> To proxy concentration of political power, Oto-Peralías and Romero-Ávila used the percentage of the population who lived under a seigneurial jurisdiction in 1797. However, seigneurial jurisdictions were abolished in 1837, so they are not a source of continuity.

<sup>38</sup> The sample is restricted to those provinces that were actually re-conquered, so those that remained in “the initial area of resistance” were removed (Asturias, Cantabria and the three provinces of Basque Country).

<sup>39</sup> The tests are generally satisfactory except for the endogeneity test in Column (1), which shows a p-value over 10%. This means that the test cannot reject the null that the instruments are exogenous. This can be due to the use of two related endogenous regressors. In fact, when used in separate regressions with their own IVs (not reported here), the endogeneity test rejects the null at 10% in both cases.

<sup>40</sup> Weak instruments test’s null hypothesis cannot be rejected at the standard parameters ( $\alpha = 5\%$ ,  $\tau = 10\%$ ) for this Column (2) and can only be rejected at  $\alpha = 5\%$  and  $30\%$  or  $\alpha = 10\%$ ,  $\tau = 20\%$ .

<sup>41</sup> Special regional civil codes have been elaborated in Galicia, Navarre, Basque Country, Aragon, Catalonia, and Balearic Islands. The Valencian Community has the right to elaborate a regional code but has not done it yet (as of today only a couple of laws are in force). Certain municipalities of Extremadura by the frontier with Portugal have also a special regime in matrimonial matters. Neither Valencian Community nor Extremadura have been included in the variable *Castilian private law*.

Table L.1

Controlling for the continuation of institutional particularities: tax autonomy and private law.

	(1)	(2)	(3)	(4)
<b>Panel A: Second stage</b>				
Dependent:	<i>GDP per capita 2015</i>			
<i>Culture</i>	0.181*** (0.02)	0.210*** (0.03)	0.194*** (0.03)	0.222*** (0.03)
<i>Tax autonomy</i>	0.110 (0.07)	0.09 (0.08)		
<i>Castilian private law</i>			-0.058 (0.06)	-0.075 (0.06)
_cons	0.933*** (0.03)	0.811*** (0.27)	0.981*** (0.02)	1.070*** (0.32)
<b>Panel B: First stage</b>				
Endogenous:	<i>Culture</i>			
<i>Municipal autonomy in Middle Ages</i>	0.870** (0.26)	0.762** (0.31)	0.939*** (0.25)	0.846*** (0.28)
<i>Constraints on the executive 1600-1800</i>	0.767*** (0.20)	0.673** (0.30)	0.418*** (0.11)	0.368*** (0.10)
<i>Tax autonomy</i>	-1.142** (0.50)	-1.074 (0.80)		
<i>Castilian private law</i>			-0.221 (0.17)	0.023 (0.19)
_cons	-0.291** (0.13)	-2.837** (1.18)	-0.263** (0.12)	-2.306** (0.98)
N	50	50	50	50
Geographic controls	No	Yes	No	Yes
Weak instruments test (tau=10%, $\alpha$ =5%)	17.1 (15.8)	8.4 (14.2)	13.9 (17.5)	11.0 (17.8)
Endogeneity tests (p-value)	0.0368	0.0092	0.0058	0.0022
Overidentification test	0.3667	0.5056	0.5795	0.7989

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*. *Weak instruments test* is the Olea and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%: to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test* reports the Hansen J test's p-value with the null being that instruments are valid. GDP per capita 2015 is indexed, with Spain being 1.

*Castilian private law* is substantially correlated with *Culture* (-0.5212), *Municipal autonomy in the Middle Ages* (-0.3420) and *Constraints on the executive 1600-1800* (-0.6132) due to related historical reasons. Although coefficients' results are satisfactory, this fact affects the strength of our IVs before the weak instruments test when *Castilian private law* is included in the first stage of our 2SLS regressions. Weak instruments test's null hypothesis cannot be rejected at the standard parameters for both Regressions (3) and (4) but can be rejected at critical values for tau 20%. The rest of the tests have satisfactory results.

#### Appendix M. 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 explaining 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.

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. Fig. M.1 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 occurring 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. Additionally, 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.

**Table M.1**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:	<i>Average gross income per capita in the municipality in 2016</i>							
<i>Municipal autonomy in the Middle Ages</i>	3473*** (324)	1920*** (478)		3530*** (243)	2764*** (322)	1380*** (488)	2220*** (339)	1991*** (466)
<i>Genetics: Galician cluster</i>			3431*** (480)	2039*** (438)	722 (629)	460 (737)	1760*** (658)	1360 (963)
<i>Genetics: Asturian-Leonese cluster</i>			4217*** (402)	2327*** (360)	3693*** (359)	2447*** (921)	3563*** (345)	2925*** (928)
<i>Genetics: Castilian cluster</i>			3535*** (396)	1653*** (357)	1617*** (334)	1927*** (712)	2046*** (312)	1402*** (631)
<i>Genetics: Aragonese-Valencian cluster</i>			5363*** (519)	3046*** (492)	-377 (423)	401 (1126)	149 (430)	1484 (1023)
<i>Genetics: Catalan-Majorcan cluster</i>			11143*** (524)	6637*** (539)	-2333*** (606)	-9513*** (1034)	-1232** (587)	-5764*** (1043)
_cons	15503*** (93)	-9219774*** (2680975)	14634*** (444)	16085*** (399)	11874*** (393)	-1.06e+07*** (3010631)	2872746*** (479163)	-3965928 (3804270)
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
R <sup>2</sup>	0.3584	0.1679	0.2847	0.3308	0.3898	0.2131	0.4767	0.3477

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.

To include genetic clusters in the analysis, we consider two different samples: full and restricted. The full sample contains the municipalities of more than 1000 inhabitants of all the autonomous communities, except Canary Islands, Basque Country, Navarre, and the autonomous cities of Ceuta and Melilla<sup>42</sup>. The restricted sample contains the municipalities of the most proximate provinces to both sides of the frontier of *Municipal autonomy in the Middle Ages*<sup>43</sup>. In the full sample, the municipalities in the area that experienced autonomy in the Middle Ages have, on average, an income per capita around 6000 euros higher in 2016, while in the restricted sample the gap is around 4,000 euros<sup>44</sup>. 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<sup>45</sup>.

Table M.1 performs a series of regressions to test whether this difference in income per capita is significant and robust to additional 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 polynomial 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 clusters<sup>46</sup>. 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).

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

<sup>42</sup> Canary Islands, Ceuta and Melilla are absent in Bycroft et al. (2019) work and Basque Country and Navarre 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.

<sup>43</sup> 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.

<sup>44</sup> 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).

<sup>45</sup> For example, north-south gaps can be attributed to temperature or sunny days, and west-east gaps to proximity to continental Europe.

<sup>46</sup> Since these clusters (and dummies) overlap, there is no reference category, and all the variables are included in the regression.

similar general results as in Column (5) for Castilian, Asturian-Leonese, Aragonese-Valencian and Galician clusters, and the Catalan-Majorcan cluster turns more extreme. 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.

#### Appendix N. Alternative cultural index: *culture* built from provincially aggregated cultural indicators

For this appendix, we aggregate all the cultural indicators provincially (assuming high sampling errors but allowing for complete provincial variation in all the indicators) and build a new cultural index: *Culture\_prov*. Recall that the original cultural index, used in the main research, contained three indicators that were aggregated at autonomous community level. With this new cultural index, we repeat most of the exercises done in the main research, to test the robustness of the main results.

Table N.1 is the matrix of correlations among main variables. The original cultural index (*Culture*) and the provincial one (*Culture\_prov*) present a correlation coefficient of 0.7891 and the correlations of *Culture\_prov* with the rest of variables are weaker but still

**Table N.1**

Correlation matrix among *Culture*, *Culture\_prov*, GDP per capita and the historical instruments.

		[1]	[2]	[3]	[4]	[5]
[1]	<i>GDP per capita 2015</i>	1				
[2]	<i>Culture</i>	0.8078**	1			
[3]	<i>Culture_prov</i>	0.6585**	0.7891**	1		
[4]	<i>Municipal Autonomy in Middle Ages</i>	0.7585**	0.7150**	0.6639**	1	
[5]	<i>Constraints on the executive 1600-1800</i>	0.7219**	0.7165**	0.4906**	0.4992**	1

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

**Table N.2**

Repeating core regressions with *Culture\_prov* (I): GDP per capita 1860, geography and other institutions.

	(1)	(2)	(3)	(4)	(5)
<b>Panel A: Second stage</b>					
Dependent:			<i>GDP per capita</i>		
<i>Culture_prov</i>	0.248*** (0.04)	0.251*** (0.04)	0.231*** (0.06)	0.217*** (0.05)	0.209*** (0.04)
<i>GDP per capita in 1860</i>		-0.057 (0.04)			
<i>Latitude</i>			0.007 (0.01)		
<i>Longitude</i>			0.002 (0.01)		
<i>Altitude</i>			0.081 (0.08)		
<i>Coast density</i>			0.882*** (0.24)		
<i>Ruggedness index</i>			-0.000 (0.00)		
<i>Tax autonomy</i>				0.144* (0.08)	
<i>Castilian private law</i>					-0.123** (0.06)
_cons	0.942*** (0.02)	0.997*** (0.05)	0.623* (0.35)	0.93*** (0.03)	1.025*** (0.05)
<b>Panel B: First stage</b>					
Endogenous:			<i>Culture_prov</i>		
<i>Municipal autonomy in Middle Ages</i>	1.113*** (0.29)	1.105*** (0.37)	1.168*** (0.34)	1.112*** (0.32)	1.111*** (0.29)
<i>Constraints on the executive 1600-1800</i>	0.212* (0.12)	0.213** (0.13)	0.108 (0.14)	0.215 (0.31)	0.197 (0.15)
<i>GDP per capita in 1860</i>		0.105 (0.37)			
<i>Latitude</i>			0.03 (0.03)		
<i>Longitude</i>			0.004 (0.03)		
<i>Altitude</i>			-0.426 (0.41)		

(continued on next page)

Table N.2 (continued)

	(1)	(2)	(3)	(4)	(5)
<i>Coast density</i>			-0.106 (1.31)		
<i>Ruggedness index</i>			0.003 (0.01)		
<i>Tax autonomy</i>				-0.013 (0.89)	
<i>Castilian private law</i>					-0.055 (0.28)
_cons	-0.49*** (0.15)	-0.587 (0.36)	-1.65 (1.35)	-0.488** (0.21)	-0.451** (0.22)
N	50	50	50	50	50
Weak instruments test (tau=10%, $\alpha$ =5%)	29.8 (14.5)	29.8 (13.9)	15.1 (16.6)	11.9 (11.8)	18.2 (11.3)
Endogeneity tests (p-value)	0.0001	0.0000	0.0000	0.0005	0.0000
Overidentification test	0.2556	0.2623	0.1268	0.6268	0.5472

Notes: Clustered standard errors at autonomous community level 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*. *Weak instruments test* is the Olea and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%: to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test* reports the Hansen J test's p-value with the null being that instruments are valid. GDP per capita 2015 and 1860 are indexed, with Spain being 1.

Table N.3

Repeating core regressions with *Culture\_prov* (II): Growth of GDP per capita in selected periods.

	(1)	(2)	(3)	(4)	(5)	(6)
	Sample 1860-2015	Sample 1860-1920	Sample 1920-1930	Sample 1930-1940	Sample 1940-1975	Sample 1975-2015
<i>Dependent:</i>			<i>Growth of GDP per capita</i>			
<i>Std. Culture_prov_hat</i>	1.183* (0.59)	0.248** (0.10)	-0.010 (0.03)	0.079*** (0.03)	0.170** (0.07)	0.297** (0.06)
<i>Std. GDP per capita1860</i>	-5.159** (1.81)	-0.288** (0.12)				
<i>Std. GDP per capita 1920</i>			-0.087*** (0.02)			
<i>Std. GDP per capita 1930</i>				-0.087*** (0.02)		
<i>Std. GDP per capita 1940</i>					-0.345*** (0.08)	
<i>Std. GDP per capita 1975</i>						-0.474*** (0.07)
_cons	12.298*** (0.85)	0.62*** (0.08)	0.244*** (0.04)	-0.184*** (0.02)	1.696*** (0.06)	2.107*** (0.06)
N	50	50	50	50	50	50
R <sup>2</sup>	0.537	0.2542	0.1655	0.3134	0.4639	0.5357

Notes: Clustered standard errors at autonomous community level in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Estimation method: OLS. *Culture\_prov\_hat* is the prediction of *Culture\_prov* on the instruments *Municipal autonomy in Middle Ages* and *Constraints on the executive 1600-1800*; it has been standardized in order to make comparisons with other coefficients.

highly significant. In the first stage, Municipal Autonomy's coefficient is highly stable and significant but *Constraints on the executive's* coefficient is weakly significant or not significant. Tests remain satisfactory but Column (3) only rejects the Weak Instruments test at tau=20% —as in the equivalent regression of Table 4(A).

Table N.2 repeats important regressions in Table 4(A) and Table L.1 using *Culture\_prov*. Columns (1-3) repeat the most important regressions in Table 4(A): the baseline Model (1), with historical economic control (3), and with geographic controls (4). Columns (4) and (5) replicate Columns (1) and (3) of Table L.1 in Appendix L. *Culture\_prov* shows similar results in terms of sign and significance,



**Table N.4**Repeating core regressions with *Culture\_prov* (III): *Landless workers 1797* and *Rate of reconquest*.

	(1)	(2)		
Panel A: Second stage				
Dependent:	GDP per capita 2015			
Culture_prov	0.197*** (0.05)	0.189*** (0.06)		
Landless workers 1797	-0.003 (0.00)	-0.006 (0.01)		
_cons	1.089*** (0.11)	2.644 (2.67)		
Panel B: First stage				
Endogenous:	Culture_prov	Landless workers 1797	Culture_prov	Landless workers 1797
Municipal Autonomy in Middle Ages	1.144*** (0.35)	0.471 (5.64)	1.273*** (0.21)	2.279 (4.78)
Constraints on the executive 1600-1800	0.225 (0.19)	1.613 (3.13)	0.064 (0.21)	-3.991 (3.14)
Rate of Reconquest	0.003 (0.02)	2.206*** (0.49)	0.010 (0.03)	0.819* (0.48)
_cons	-0.534* (0.28)	34.429*** (6.43)	-2.712 (2.07)	274.39*** (36.58)
N	45		45	
Geographic controls	No		Yes	
Endogeneity test (p-value)	0.0003		0.0000	
Overidentification test	0.6107		0.5285	

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*. Geographical controls are: *Latitude*, *longitude*, *altitude*, *coast density* and *ruggedness index*. We do not report any test for weak instruments because we do not know of any test for a 2SLS with more than one endogenous regressor and clustered standard errors. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test* reports the Hansen J test's p-value with the null being that instruments are valid.

and coefficients' sizes are not much altered.

Table N.3 repeats growth regressions obtaining similar results as those in Table 6 but with *Culture\_prov* having less significant coefficients.  $R^2$  are also very similar in all the regressions to those in Table 6.

Table N.4 repeats Table K.1 of Appendix K. Results are similar but significance levels and  $R^2$  are slightly reduced.

In sum, the cultural index built from provincially aggregated indicators also elicits positive results in relation to our main hypotheses. Therefore, results and interpretations made in the main research have a substantial degree of robustness.

Regarding the interpretation of the behavior of our IVs in the first stages. If provincial variations of these cultural traits are approximately correct, *Constraints on the executive* were not that important as inclusiveness experiences at local level in the shaping of these cultural traits, a point suggested by Soto-Onate (2017).

#### Appendix O. Alternative controls: autonomous community fixed effects, historical urbanization rates and quality of regional government index

In this appendix, we use alternative controls to further test the robustness of the main results. In Column (1) of Table O.1, the baseline model is controlled for autonomous community fixed effects. When we introduce autonomous communities fixed effects, we cannot use the variable *Constraints on the executive* as an instrument, because it only varies at autonomous community level. The borders of the historical kingdoms in the considered periods coincide exactly with the borders of current autonomous communities. Since there is no intra-autonomous community variation, the variable is omitted in the regression. We can see in the table that municipal autonomy's coefficient remains significant in both stages, only altered in size in the first stage due to the absence of *Constraints on the executive*.

Columns (2)-(13) include historical urbanization rates in the baseline model, to see whether the urbanization rates of any specific period affect the significance of *Culture's* coefficient (we include back the instrument *Constraints on the executive*). *Culture's* coefficient is almost unaltered across specifications.

The Quality of Government Index captures citizens' perceptions on quality of governance, corruption, and impartiality in three public services (health, education, and policing) in their region of residence. The variable *Quality of Gov. Index 2010-21* introduced in Column (14) is the average of this indicator in the years 2010, 2013, 2017 and 2021. It is not significant in any of the stages while main results remain unaltered.

Table O.1

Alternative controls: autonomous community fixed effects, historical urbanization rates and quality of regional government index.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>Panel A: Second stage</b>														
Dependent:	<i>Provincial GDP per capita in 2015</i>													
<i>Culture</i>	0.27** (0.12)	0.22*** (0.02)	0.22*** (0.02)	0.22*** (0.02)	0.22*** (0.02)	0.22*** (0.02)	0.21*** (0.02)	0.21*** (0.02)	0.21*** (0.02)	0.21*** (0.02)	0.21*** (0.02)	0.21*** (0.02)	0.22*** (0.02)	0.21*** (0.02)
<i>urbanization rate 800</i>		-0.003 (0.00)												
<i>urbanization rate 900</i>			0.01 (0.02)											
<i>urbanization rate 1000</i>				0.001 (0.00)										
<i>urbanization rate 1200</i>					-0.00 (0.01)									
<i>urbanization rate 1300</i>						-0.01* (0.00)								
<i>urbanization rate 1400</i>							-0.02** (0.01)							
<i>urbanization rate 1500</i>								-0.004 (0.01)						
<i>urbanization rate 1600</i>									-0.01* (0.00)					
<i>urbanization rate 1700</i>										-0.01** (0.00)				
<i>urbanization rate 1750</i>											-0.005 (0.00)			
<i>urbanization rate 1800</i>												-0.004 (0.00)		
<i>urbanization rate 1850</i>													-0.003 (0.00)	
<i>QoG Index 2010-21</i>														0.02 (0.06)
<i>_cons</i>	0.97*** (0.11)	0.94*** (0.03)	0.93*** (0.03)	0.93*** (0.03)	0.94*** (0.03)	0.94*** (0.03)	0.96*** (0.02)	0.94*** (0.02)	0.96*** (0.02)	0.96*** (0.03)	0.95*** (0.02)	0.96*** (0.03)	0.96*** (0.03)	0.94*** (0.02)
<b>Panel B: First stage</b>														
Endogenous:	<i>Culture</i>													
<i>Mun. autonomy in Middle Ages</i>	0.43** (0.16)	0.89*** (0.25)	0.91*** (0.25)	0.88*** (0.25)	0.95*** (0.26)	0.93*** (0.25)	0.96*** (0.24)	0.91*** (0.25)	0.97*** (0.25)	0.96*** (0.21)	0.97*** (0.21)	1.00*** (0.24)	0.99*** (0.22)	0.95*** (0.35)
<i>Constr. on exec. 1600-1800</i>	Omitted	0.47*** (0.10)	0.47*** (0.10)	0.47*** (0.10)	0.48*** (0.10)	0.48*** (0.10)	0.47*** (0.10)	0.47*** (0.10)	0.51*** (0.08)	0.50*** (0.08)	0.50*** (0.08)	0.45*** (0.09)	0.45*** (0.09)	0.49*** (0.16)
<i>urbanization rate 800</i>		-0.03* (0.02)												
<i>urbanization rate 900</i>			-0.10* (0.05)											
<i>urbanization rate 1000</i>				-0.01 (0.01)										
<i>urbanization rate 1200</i>					0.03 (0.04)									
<i>urbanization rate 1300</i>						0.02 (0.03)								

(continued on next page)

Table O.1 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
urbanization rate 1400								0.04 (0.04)						
urbanization rate 1500									-0.01 (0.01)					
urbanization rate 1600										0.05 (0.04)				
urbanization rate 1700											0.06 (0.04)			
urbanization rate 1750												0.05 (0.03)		
urbanization rate 1800													0.03 (0.02)	
urbanization rate 1850														0.02* (0.01)
QoG. Index 2010-21														-0.11 (0.37)
_cons	-0.88*** (0.07)	-0.36*** (0.12)	-0.37*** (0.12)	-0.35*** (0.11)	-0.42*** (0.13)	-0.42*** (0.12)	-0.45*** (0.12)	0.94*** (0.02)	-0.58*** (0.20)	-0.57*** (0.16)	-0.57*** (0.16)	-0.59*** (0.18)	-0.63*** (0.16)	-0.42*** (0.15)
Auton. com. fixed effects	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No
N	50	48	48	48	48	48	48	48	48	48	48	48	48	50
Weak instruments test	7.22 (23.1)	19.1 (15.5)	19.8 (15.5)	18.9 (15.6)	19.2 (15.1)	19.9 (15.5)	21.2 (15.1)	17.5 (16.1)	21.4 (16.6)	26.6 (15.6)	26.1 (16.5)	24.2 (15.4)	26.9 (14.6)	16.6 (15.2)
Endogeneity tests (p-value)	0.0016	0.0041	0.0038	0.0042	0.0039	0.0044	0.0039	0.0050	0.0037	0.0025	0.0009	0.0020	0.0010	0.0040
Overidentification test		0.7448	0.7360	0.7229	0.7319	0.7444	0.8580	0.7343	0.7088	0.7081	0.7101	0.8283	0.7949	0.7460

Notes: Robust standard errors in parentheses in Column (1) and clustered standard errors at autonomous community level in Columns (2)–(14). \*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*. *Weak instruments test* is the Oleva and Pflueger test for 2SLS and clustered standard errors against the null that the instruments are irrelevant in the first stage; it reports the F-statistic and the critical value (in parenthesis) for the standard (and conservative) parameters of tau at 10% and confidence level at 5%; to reject the null, the statistic must be higher than the critical value. *Endogeneity test* reports the p-value of Wooldridge endogeneity test for robust errors against the null that the instrumented variable is exogenous. *Overidentification test*, for Columns (2)–(14), reports the Hansen J test's p-value with the null being that instruments are valid. *GDP per capita 2015* is indexed, with Spain being 1. *QoG Index 2010-21* is the average European Quality of Government Index in the autonomous communities of the years 2010, 2013, 2017 and 2021.

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