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Institutions, State development and Education in Spain during the 19th and early 20th Centuries

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ABSTRACT

This article discusses how the existence of two different institutional systems and their interactions in Spain in the 19th and early-20th centuries can affect education. In the mid-19th century, the *foral* institutions had a positive effect on education in *foral* municipalities. However, with the deployment of the Spanish state during the late-19th and early-20th centuries, it can be observed how the conflict between the State and the *foral* institutions led to better educational results in the municipalities under the *common* regime. This can be explained by the fact that education was used as a field of dispute in the constant political conflict between *foral* provinces and the State in an attempt to maintain the political and economic privileges granted to them by the *fueros*.

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Instituciones, Estado y educación en España en el siglo XIX y principios del XX

RESUMEN

Este artículo aborda cómo la existencia de dos sistemas institucionales diferentes y sus interacciones en España durante el siglo XIX y principios del XX pudieron afectar a la educación. A mediados del siglo XIX, las instituciones forales tuvieron un efecto positivo en la educación de estas regiones. Sin embargo, con el despliegue del Estado español durante finales del siglo XIX y principios del XX, se puede observar cómo el conflicto entre este y las instituciones forales llevó a que los municipios bajo el régimen común tuvieran mejores resultados educativos. Esto se explica debido a que la educación fue utilizada con campo de disputa en el constante conflicto político entre estas provincias y el Estado por intentar mantener los privilegios políticos y económicos que les brindaban los fueros.

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1. Introduction

By scrutinizing the entrenchment of local and regional institutions alongside the State's expansion, this article delves into how conflicts among various institutional hierarchies may influence human capital formation. Following an institutional conflict framework (Acemoglu, 2003; Acemoglu and Robinson, 2006), this article focuses on the late-19th and early 20th centuries as the period of study, aiming to explore how the development of Nation-States during this era may have conflicted with established local and regional institutions within the territory. The development of modern Nation-States during the 19th was a key element in the expansion of education, as to solidify the authority of the emerging State apparatus, a standardized and uniform education system was deemed essential (Boli *et al.*, 1985; Westberg *et al.*, 2019; Beltrán Tapia *et al.*, 2023). Moreover, as Capelli (2016) and Capelli and Vasta (2020) show for Italy, the expansion of the State and the centralization of education was critical for the improvement of human capital in the population. Thus, historically entrenched regional institutions may have responded to the State's expansion during the 19th and early 20th centuries, particularly when these institutions managed and provided public functions that the State sought to control, such as education.

Consequently, this article compares neighbouring Spanish municipalities that were governed by two distinct institutional systems: *foral* and *common*, which persisted in Spain until the early 20th century[1]. The Spanish context is particularly intriguing because *foral* territories enjoyed political autonomy for much of the 19th century and operated under a distinct taxation system until 1936. Additionally, public schools were locally provided until 1902, thus rendering town councils financial capacity a critical factor in primary education provision in Spain until the early 20th century. Therefore, this paper uses Spatial Regression Discontinuity Design (SRDD) as a methodology to assess how these institutions reacted to the State's expansion and its impact on local education provision and literacy rates. Through the SRDD, this study will examine how similar towns and their residents in the northern provinces of Biscay, Alava and Navarre *(foral)*, along with their neighbouring *common* provinces of Huesca, Zaragoza, Soria, Rioja, Burgos and Cantabria, behaved under these two different systems: *foral* and *common*.

In this regard, this paper has two aims. Firstly, it seeks to demonstrate how distinct institutional frameworks influenced the local provision of public education and the potential ramifications on literacy. This could be attributed to different educational policies, as *foral* institutions might have had a more positive or negative attitude towards education compared to *common* provinces, given their political autonomy until the mid-19th century. Alternatively, the higher economic development in these territories, driven by the positive effects of *foral* privileges until 1936, may have created a more dynamic economy that exerted a positive influence on education. Secondly, by examining a period characterized by political upheaval between *foral* provinces and the Spanish State, this paper aims to elucidate how the expanding State capacity might impact

local and regional institutions, which were opposed to such State development. These effects will be seen by analysing the provision of primary schools in 1845, 1903, and 1908, alongside an investigation into public educational expenditure in the latter year and the male and female literacy rates in 1860, 1877, 1887, 1900, 1910, and 1920.

The result show two significant implications. Firstly, a crucial factor influencing human capital formation during this period was access to public schools, particularly for women. *Foral* policies in Alava and Navarre, which allowed girls to access non-gender-segregated education, resulted in significantly higher female literacy rates in these regions compared to *common* municipalities until 1900. Secondly, the development of the Spanish State during the latter half of the 19th century was perceived by *foral* institutions as a threat to their traditions, political autonomy, and economic independence. Consequently, state laws were fiercely contested, leading to the delay of the centralization of teachers' wages from 1902 to 1912. This institutional conflict between State and *foral* territories, combined with the advancement of the educational system mandated by the state in *common* municipalities, marked a turning point in the early 20th century. As a result, the previously higher female literacy rates in Navarre were halved, the advantage in Alava disappeared, and towns in Biscay had lower literacy levels than common municipalities in 1910 and 1920.

The structure of the paper is as follows. Section 2 explains the historical background, giving a general overview of Spain, and a more detailed account of the *foral* tax and legal system. Section 3 describes the data used. Section 4 presents the methodology used, while Section 5 briefly exposed the results and discussed their implication, and Section 6 concludes.

2. Historical Background

Throughout the 19th century, the development of European Nation-States, the expansion of state bureaucracy and national authority, coincided with an increasingly industrialized and complex societies, leading to the introduction of various public services such as sanitation and education (Lindert, 2004; Magnusson, 2009; Cardoso and Lains, 2010; Dincecco, 2015). For instance, during the 19th century, western states passed nationwide education laws to establish mass schooling and improve the population's education (Westberg *et al.*, 2019).

In Spain, the persistent political instability until the 1840s, impeded the transition to the modern Nation-State during the first decades of the 19th century (Pro Ruiz, 2019). This was reflected in the territorial and the administrative organization of the Nation, as provinces and their regional governments were not effectively created until 1833 (Agirreazkuenaga Zigorraga, 1996). This absence of State formation in the first half of the century resulted in municipalities being the primary administrative entities, as they were the sole effectively operational administrative body in the nation (Del Moral Ruiz, 2007, pp. 72-85).

In terms of education, by the late 18th century, policymakers and intellectuals began to view education as a pivotal solution for Spanish economic development (Araque Hontangas, 2013). However, the instability of the early 19th century resulted in short-lived educational laws during this period (Ávila Fernández, 1990). It was not until 1857 that an Educational Law was effectively enacted, being also the first that

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[1] *Foral* and *common* in italics will be used through the paper as the adjective describing those towns, provinces or territories that were in one of those two taxation and legal regimes in Spain.

made female education mandatory. Nonetheless, all educational laws delineated a clear hierarchy of responsibilities regarding funding and provision, with town councils overseeing primary education.

Crucial for ensuring compliance with educational laws by regional governments and town councils were the education committees and educational inspection mechanisms. The first law to establish provincial education committees was the Plan y Reglamento de las Escuelas de Primeras Letras of 1825, which introduced the creation a committee established in each provincial capital (López del Castillo, 2013, pp. 68-72). Although these educational laws emphasized the supervisory role of provincial committees over primary education, direct inspection of primary education was the responsibility of local committees. This framework for educational inspection was largely retained in subsequent education laws, with provincial committees' oversight role bolstered following the establishment of provinces and the regional administrative structure in 1833 (*ibid.*, pp. 82-130). Furthermore, in 1849, the administrative body of provincial school inspectors was established to enhance supervision of primary education (*ibid.*, pp. 132-136).

Graph 1 illustrates over a century of education provision, depicting primary schools and teachers from 1797 to 1910, in absolute and per capita terms. The period between 1830 and 1870 witnessed the most significant increase in education provision, with stagnation observed at the beginning and end of the century. Despite the instability in educational legislation prior to the education law of 1857, municipalities managed to double the number of schools during the first half of the century, rising from approximately 10,000 in the early 1820s to 20,743 in 1855. Following 1857, the growth in schools was less pronounced, decelerating during the 1870s, although provision increased from 20,723 before 1857 to 30,073 in 1908. However, the graph indicates that by the 1880s, school provision reached a plateau, which is also evident for teachers. This could be also seen in the per capita figures. As the population continuously increased during the century, the stagnation of education provision during the last quarter of the century was translated into lower teachers and schools per capita.
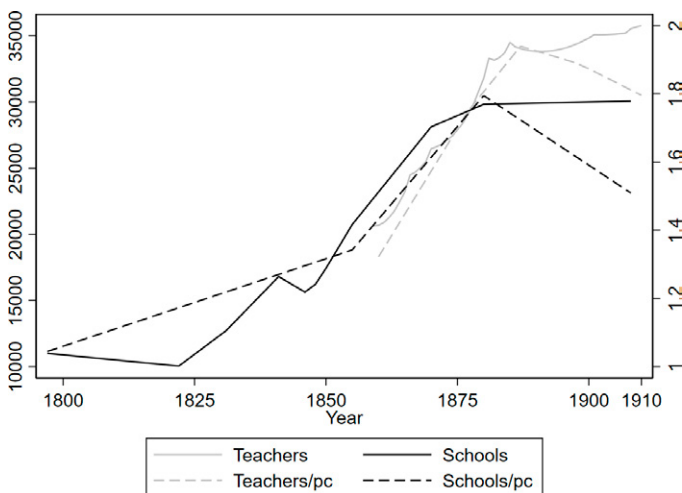
Graph 1. Evolution of Education Provision in Spain.

Source: Own elaboration with data from Nuñez (2005, pp. 207-209) and *Reseña geográfica y estadística de España, Instrucción pública, Primera Enseñanza* (1888) and *Estadística Escolar de España* of 1908.

2.1. The foral territories

Despite the development of the Liberal State during the 19th century, Spain's provinces of Biscay, Gipuzkoa, Alava, and Navarre (the *foral* provinces, highlighted within the red border in Figure 1) maintained a unique relationship with the State. In the 18th century, kings swore to uphold the *fuero*, regional laws akin to a constitution, granting legal freedoms like the *pase foral*, a mechanism to veto conflicting national laws (Grafe, 2012). Despite opposition, the *foral* provinces retained some autonomy, including the pase foral until the 1840s (Irigoras Alberdi, 2008). This allowed them to resist fully implementing national laws, such as the financial reforms in the 1840s and contribute only small periodic donations to the central budget until the 1870s (Agirreazkuenaga and Ortiz de Orruño Legarda, 1988).

Furthermore, until the mid-19th century, these four territories had autonomous regional governments (Cortes in Navarre and Juntas Generales in Biscay, Gipuzkoa, and Alava) that, while not fully independent, had the authority to enact their own legislation. These regional governments consisted of representatives from every town in each Basque province and, in Navarre, included the three estates (Church, Nobility, and Towns) until the administrative reforms of the mid-19th century (Agirreazkuenaga Zigorraga, 1996). Thus, these governments functioned as a type of municipal assembly with significant control over local administrations, as bureaucracy began to develop in these territories from the late 18th century (Martínez Rueda, 1994; Larrazabal Basañez, 2012).

For instance, in Navarre, the Cortes issued an educational law in 1780 mandating Navarrese town councils to establish and finance primary schools for both boys and girls, making primary education compulsory for both genders from ages five to 12 (Laspalas Pérez, 2002). In 1817, building on this educational initiative, the Cortes proposed the establishment of local school boards or committees to oversee the proper development of primary education in each Navarrese town. Additionally, a higher-level board would be established to determine public teachers' salaries, the process for becoming a public teacher, or general regulations for the operation of public primary schools in Navarre (Berruezo Albéniz, 1986). However, it was not until 1828 that this law was officially approved, differing significantly from the one passed by the State in 1825, as education was made mandatory for children aged 5 to 12, and equal treatment for boys and girls was ensured. In contrast, in the national regulation, education for girls was contingent upon the willingness of town councils to provide it.

Likewise, in 1827, the regional government of Alava enacted an adaptation of the State's Educational Law of 1825, modified to the specificities of the *fuero* in the province. Notably, one significant modification made by the *foral* government was to make primary schools provided by municipalities free, funded by taxes from the town councils, rather than allowing funding through tuition fees, as permitted in the national original legislation (Plan de Escuelas de Primeras Letras, Acomodado a las de esta provincia de Alava, 1827, art. 145). In 1832, the foral government of Alava passed a series of amendments to the Educational Law of 1825, reiterating the public funding of primary schools and the prohibition of tuition fees (Letamendia Pérez de San Román, 1990). However, in Biscay and Gipuzkoa, there were no similar educational initiatives emanating from their Juntas.

This illustrates the differences among the four *foral* provinces. While Navarre had a clear educational policy and Alava attempted to adapt national laws to the specifics of its *fuero*, there is a lack of studies on the educational policies of Biscay and Gipuzkoa during the late 18th and early 19th centuries, making it difficult to clarify their stance. Nevertheless, the political autonomy of the four provinces allowed them to have independent educational policies.
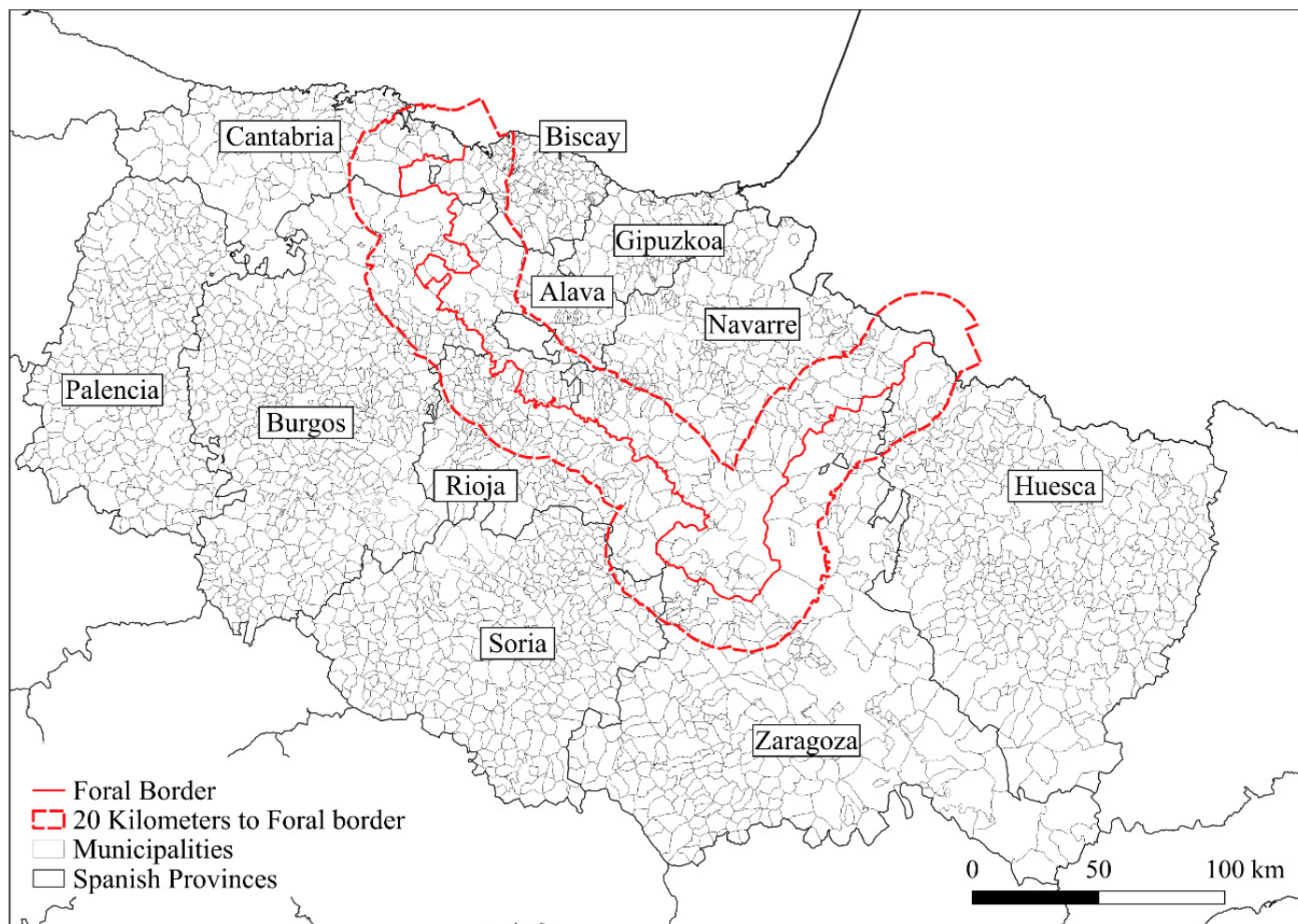

Figure 1. Foral Border and Spanish Provinces.
Source: Own elaboration.

2.2. The assimilation of the Foral territories into the Spanish Nation-State

Although there was a shift in the relationship between the *foral* territories and the Spanish State from the mid-19th century, the initial effort to standardize legislation across all Spanish territories was eventually reversed. For instance, despite the revocation of their political autonomy, which included the abolition of the Cortes and Juntas and their replacement with regional administrative bodies (Diputaciones) similar to those in *common* provinces, these institutions were swiftly taken over by the former *foral* elites (Agirreazkuenaga Zigorraga, 1996).

Moreover, in 1857, a new Educational Law was enacted, facing resistance to implementation in the *foral* provinces. This law stipulated that teachers must be appointed by the Regional Committee of Public Education, overseen by the central government through the province's governor (Ferrer y Rivero 1915, p. 849). However, the Diputaciones of Biscay, Gipuzkoa, Alava, and Navarre opposed this intervention in their regional autonomy arguing that the Law openly opposes the *foral* institutions. The main complains ranged from the appointment of the teachers, their salaries, inspections of the creation of normal schools in the *foral* provinces. For instance, *foral* municipalities traditionally appointed their own teachers, and the Diputaciones Forales argued that this practice facilitated instruction, as these teachers were local residents, familiar with the regional language *(euskera)* and costumes (Dávila Balsera, 1995, pp 55-60). In response, the central government issued a Royal Decree in 1859, allowing the Regional Committee of Public Education (controlled by the Diputaciones Forales) to continue appointing teachers in these territories (Dávila Balsera, 1995, pp. 235-236).

Nevertheless, after the defeat of the Carlists in the third Carlist war (1872-1876), the political autonomy of the four provinces was abolished (Estecha y Martínez, 1902, pp. 95-97). However, the political influence wielded by regional government officials and industrialists allowed them to maintain

economic autonomy until 1936 (Alonso Olea, 1995; Estecha y Martínez, 1902, pp. 251-260). This economic autonomy manifested as financial and tax independence from the rest of the State, resulted in lower tax burdens for residents and businesses in the *foral* provinces (Alonso Olea, 1997).

In this context of economic autonomy, but political subjugation to the Spanish State, *foral* institutions utilized proposed government laws in the territory as a basis for institutional conflict to assert their autonomy. In this respect, as noted by Dávila Balsera (1995, pp. 95-97), the fervent intellectual and political movements advocating for the preservation of the *fueros* following their abolition in 1876 regarded Spanish educational legislation as integral to the assimilation of the *foral* territories and the erosion of local culture. Furthermore, politicians advocating a more nationalist agenda sought greater control over primary education, encompassing aspects such as teachers' appointments, salaries, and inspection, viewing the expansion of the State as inevitable.

Moreover, upon the establishment of the Ministry of Education in 1902, which assumed responsibility for primary teachers' salaries and teaching materials with the Real Decreto de 21 de julio de 1900[2] and the Real Decreto de 26 de octubre de 1901[3], *foral* provinces were initially excluded from centralized spending under Article 10º of the Law. It was not until 1912 that a Law centralized the expenditure from these municipalities, prompted by complaints from teachers in *foral* towns about significantly lower wages compared to the State's salaries and their exclusion from the national teacher career ladder (Maeztu Esparza, 1994; Dávila Balsera, 1995).

This situation would potentially impact education in the *foral* provinces compared to the *common* provinces. After 1902, the latter could provide more teachers than before, as the expenditure was assumed by the State. However, *foral* towns would still be restricted by their budgets, potentially limiting their capacity to provide for education. Thus, the conflict between *foral* governments and the State, as the former opposed the State assuming foral teachers' salaries, would likely affect these territories' capacity to provide education, at least until 1912.

3. Data

First of all, three distinct *Foral* variables are established, each corresponding to the *foral* provinces bordering common provinces (Biscay, Alava, Navarre), taking 1 if the municipality was in each of these *foral* provinces. Additionally, given that the two Aragonese provinces bordering *foral* provinces were historically autonomous with distinct administrative, judicial, and legislative structures compared to Castile until the early 18th century, a dummy variable is created for Huesca and Zaragoza provinces. It is important to note that the exclusion of this dummy variable from the analysis does not significantly alter the results. Moreover, although the values for Gipuzkoa and Palencia will be displayed in the following maps, it will not be included in the econometric analysis because these two provinces do not have a border in the *foral* border depicted in Figure 1, and because none of their municipalities are

within the 20 kilometres threshold that will be explained in this section.

For the purpose of this article, the *Foral* variable can be interpreted in two different ways. First, the educational policies described above for Alava and Navarre could reflect a distinct treatment or effect on education from *foral* institutions, suggesting a positive impact of these variables on schools and/or literacy rates. However, it is also possible that although *foral* institutions in Alava and Navarre had an educational policy, it might not have been effectively implemented or did not achieve the expected results. Therefore, a second interpretation emerges: these *foral* institutions may have influenced economic development. The *foral* privileges and the *Concierto*, significantly contributed to the economic development of the *foral* provinces, particularly to the industrialization of Biscay (Alonso Olea, 1995). As a result, higher economic development in the *foral* provinces, due to their fiscal privileges, could have impacted education. For instance, a more developed economy would require a more educated workforce, thereby increasing the demand for education and resulting in higher literacy rates or more schools in these towns. Thus, in this case the effect of the *Foral* variable is expected to be constant as the *Concierto* and its potential effects on economic development lasted until 1936.

In order to analyse the impact of the *foral* system on education, this article relies on local information for those municipalities that were close to the *foral* border. The availability of population and education information from 1860 onwards allowed me to retrieve municipal data for 1860, 1887, 1900, 1910 and 1920 from the population censuses, including information on male and female literacy levels, as well as on other demographic variables. Moreover, the provision of school information for each local entity in the *Diccionario de Madoz* in 1845 and the issue in 1903 and 1908 of a school census with information at the local level permits to contrast the effect of the *foral* regime, not only on literacy rates but also in the provision of public schools, which were funded and provided by town councils.

3.1. Public Schools. Madoz Data and the School censuses of 1903 and 1908

The data source for assessing education provision in the mid-19th century is the *Diccionario geográfico-estadístico-histórico de España y sus posesiones de Ultramar* published by Madoz between 1845 and 1850, which comprehensively documents local and regional entities across Spain at the end of the 1840s. For each entry there is a detailed description, including number of inhabitants, most common production and the number of public schools that were in the town. For municipalities within a 20-kilometer radius of the foral border in the provinces of Biscay, Alava, Navarre, Cantabria, Burgos, Rioja, Soria, Zaragoza, and Huesca, school counts were obtained from this Dictionary, aligning with the optimal distance for the SRDD, as will be explained in section 3.2. Due to the impracticality of gathering information for all municipalities in the nine provinces under analysis, this limitation has to be implemented[4].

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[4] The 451 municipalities that are within 20 kilometres to the *foral* border had 916 local entities and entries in the Dictionary of 1845. This could mean that for the 2,566 municipalities in the whole sample, at least a search for schools in at least 5,000 entries might be expected.
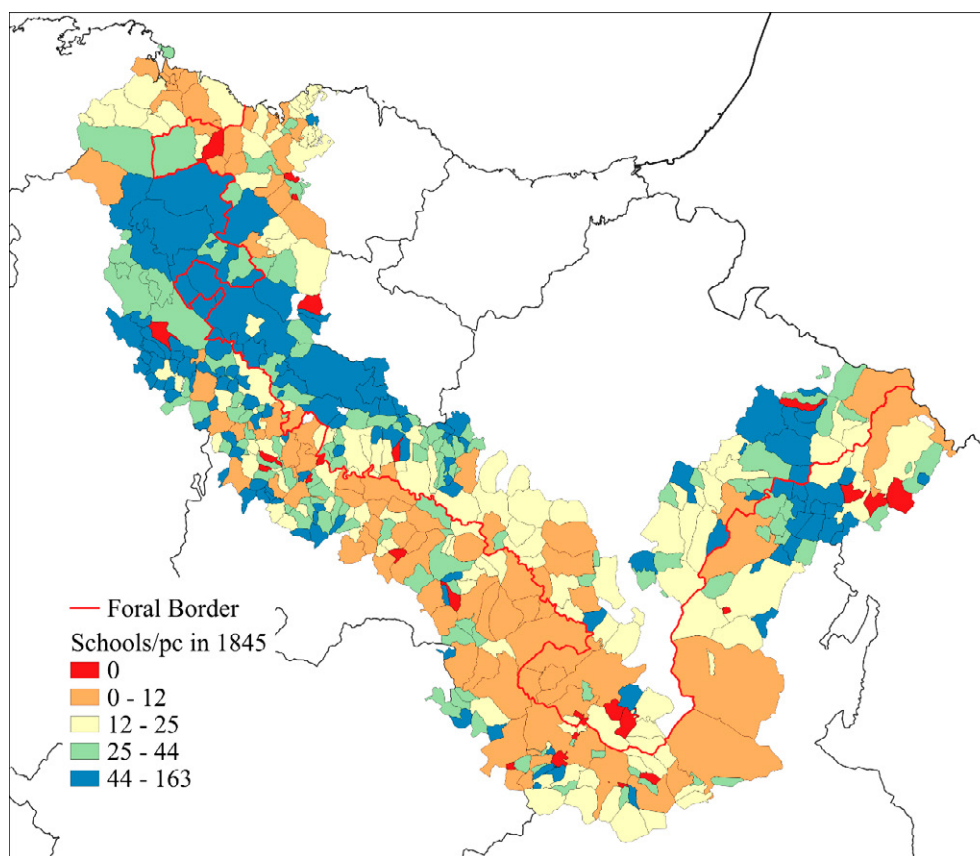
Figure 2. Schools in 1845.

Source: Own elaboration with data from *Diccionario geográfico-estadístico-histórico de España y sus posesiones de Ultramar.*

Information from the Dictionary was used to collect data on primary schools. Although some entries provided additional details such as kind of funding (public or private), or student enrolment, this information was inconsistently available and therefore not included in the analysis. Consequently, the analysis focuses on the number the total number of schools (including private and public) per 10,000 inhabitants (presented in Figure 2).

An important feature of the Dictionary is the classification of schools at provincial and *partido judicial* levels, and although not included at the municipality level, it could be relevant to understanding the results. Before the National Educational Law of 1857, the provision of schools for girls was optional, constrained by town councils' willingness and budgets. However, the Dictionary reveals that in some territories, non-gender-segregated schools (*mixta* schools) were predominant, allowing girls and boys to receive the same education when municipalities could not afford two schools. Sarasúa (2002) argues that this kind of education was important for girls as they received non-gender-specific education, unlike in girls' schools in other territories, fostering their learning.

Figure 3 illustrates the percentage of *mixta* schools in the studied territory. Except for the *common* provinces of Cantabria and Soria, significant percentages of *mixta* schools were found only in the *foral* provinces. In Alava, free education led to lower public education funding, limiting towns to providing *mixta* schools. In Navarre, the 18th century provincial Educational Law mandated girls' education without specifying seg-

regation, leading to non-gender-segregated education in budget-constrained small municipalities, particularly in the north. In other provinces, the lack of studies on educational policies during the late 18th and early 19th centuries limits potential explanations. Although population levels might explain the prevalence of *mixta* schools in Cantabria, Biscay, and Soria, similar characteristics were shared by provinces like Burgos and Huesca, suggesting regional policies or institutions might influence higher percentages as in Alava and Navarre. Besides the effects on women's education argued by Sarasúa (íd.), *mixta* schools had a significant positive on girls' attendance, as the Dictionary shows that provinces where *mixta* schools were predominant, girls represented a third of the total attendance, while in the other provinces, the average was 21.1%.

The use of the Dictionary as a data source has been criticized by Guereña and Viñao Frago (1999), because the provincial numbers for the provision of schools differed from the national statistics, showing 12% of the provinces a lower provision. Nevertheless, of the provinces analysed here, only Burgos had a lower number in the Dictionary's provincial summary with 695 schools, in contrast to the 726 shown in the official statistics considered by Guereña and Viñao Frago (íd.). However, these aggregate summaries must be approached with caution, as they were extracted from previous statistics. When a more thorough data collection is conducted, as I did in this paper by examining each municipality's entry in the Dictionary, the results differ significantly. For instance, in the *partido*
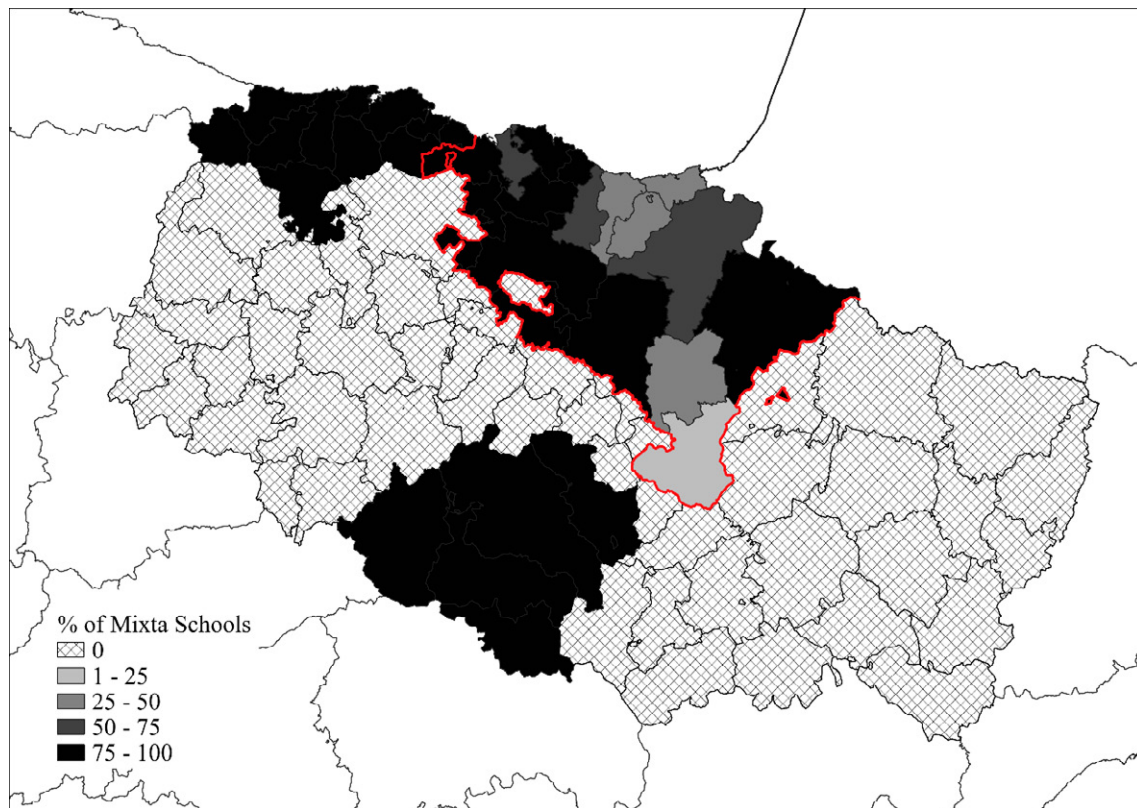
Figure 3. *Mixtas* Schools in 1845 by *Partido Judicial.*
Source: Own elaboration with data from *Diccionario geográfico-estadístico-histórico de España y sus posesiones de Ultramar.*

judicial of Miranda de Ebro in the province of Burgos, located just on the border with Alava, the number of schools obtained from this detailed examination is 63, while the summary in the Dictionary reported 28, and the official statistics depicted 39 schools. Thus, relying on information from individual entries helps prevent potential omissions of schools, at least to some extent.

The *Censo Escolar* of 1903 and *Estadística Escolar de España* of 1908 serve as the primary data sources for assessing education provision in the early-20th century. While the 1903 census records solely the number of public schools in each municipality (presented as the number of public schools per 10,000 inhabitants in Figure 4), the 1908 census provides comprehensive data including the number of both public and private schools, public expenditure, and gender-specific enrolment and attendance figures for public and private schools. Therefore, in addition to calculating the number of public schools per 10,000 inhabitants for 1903 and 1908, this study also computes the total number of schools (combining private and public) per 10,000 inhabitants, public expenditure per capita and per school for 1908.

3.2. Literacy. Population Censuses from 1860 to 1920

The population censuses provide information on the Spanish municipalities that existed from 1860 to 1920. The main variable of interest is the literacy rate, gathered for each municipality in the provinces of Biscay, Alava, Gipuzkoa and Navarre (*foral* region), and in Palencia, Cantabria, Burgos, Rio-

ja, Soria, Zaragoza and Huesca (*common* territory). Literacy is also classified by gender, representing the percentages of individuals who knew how to read and write in the total population of the municipality. Although a better measure of the literacy rate would not use the whole population (as children too young to attend school are included in our rate), the census does not classify the population by age and literacy at the municipality level. The use of the literacy rates for 1860, 1877, 1887, 1900, 1910 and 1920 by gender allows to have a deep understanding of the dynamics that the *foral* system could have before the *Concierto economico* (year 1860 and 1877), during the economic autonomy period (1887, 1900 and 1910), and after the centralization of teachers expenditures in the *foral* territories (1920).

Figure 5 shows the literacy rates for males (left) and females (right), in 1860, 1900 and 1920, representing the distribution in quantiles for each year and gender. In *foral* territory the distribution for males was similar in the three years. The highly male literacy levels in Alava or north-eastern Navarre, contrast with the low rates of Gipuzkoa, Biscay or northern Navarre. In the *common* provinces, the pattern is somewhat clear. The two Aragonese provinces included (Huesca and Zaragoza), together with southern Rioja presented lower male literacy rates throughout the period than the Castilian region, except for the municipalities in north-western Huesca.

Regarding female literacy rates, the distribution is similar to the distribution of men's education. The Aragonese provinces had lower rates than the rest of the provinces, while the *foral* provinces seems to have an initial higher rate, while this de-
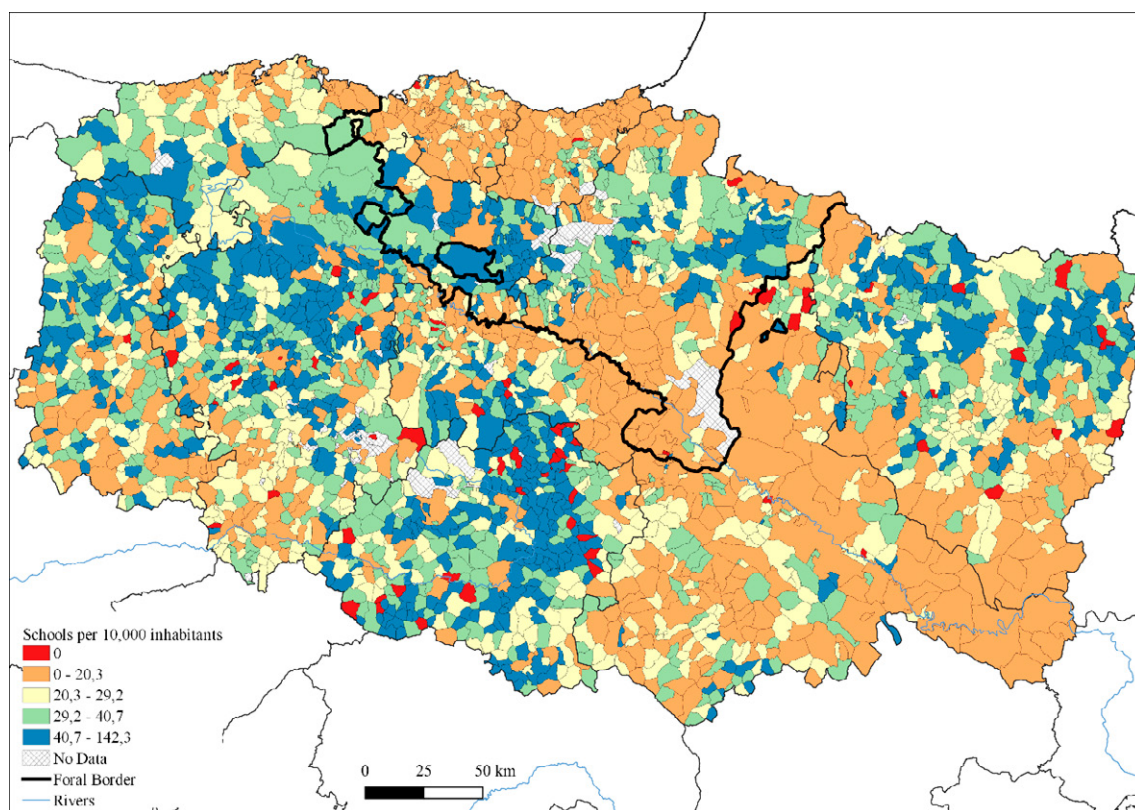
Figure 4. Quantile distribution of Public Schools per 10,000 inhabitants in 1903
Source: Own elaboration with data from *Censo Escolar* of 1903.

creased through the period. Nevertheless, parts of the *foral* region that had towns within the lower quantile in male literacy rates (north of Navarre, or Gipuzkoa), did not show the same behaviour for female education. Thus, the maps show heterogeneity in literacy levels within *foral* and *common* provinces which might indicate that the *foral* system was not affecting human capital formation during this period.

These patterns could be attributed to two main explanations. First, the low male literacy rates throughout the period and the lower female literacy in 1900 and 1920 in Biscay, Gipuzkoa, and northern Navarre could be related to Euskera, the language spoken in this area. The presence of another mother tongue (Euskera) and mandatory education in Spanish made instruction more difficult and therefore literacy would be lower, which is similar to the findings of Beltrán Tapia *et al.* (2021) for Valencia and the Catalan language during the same period.

Second, the lower literacy rates in southern Navarre, Rioja, and Zaragoza could be attributed to settlement patterns and their effects on education provision. While the average municipality in Burgos or Soria in 1845 had around 300 inhabitants, the average in southern Navarre was 1469, in southern Rioja 2523, and in Zaragoza 1194. Although this could imply higher revenues, it also meant more children to educate. This is reflected in both the attendance relative to the total population in 1845, which was the lowest in this area, around 5%, compared to other provinces that doubled or tripled this figure. Moreover, the number of schools in 1903 depicted in Figure 4 was also similar, with this region presenting the lowest numbers. Thus, some municipalities might not be able to provide

enough educational services, due to multiple factors, as the spatial pattern that emerges when comparing Figures 3 and 4 suggests.

In addition to indicating the literacy level of the local population, the population censuses provide other relevant information. Population size is gathered from each census to account for potential population dynamics affecting human capital formation. Moreover, population density is also obtained to address potential effects that population size alone could not capture.

3.3. Descriptive Statistics

Table 1 provides the summary statistics for the main variables for the municipalities in the Spanish provinces that were at 20 kilometres to the *foral* border. This is the bandwidth used for the econometric analyses, as will be explained in the next section. It could be seen that there was an important improvement in literacy rates, despite the significant gender difference. The female literacy rates surged from approximately 10% in the mid-19th century to surpassing 50% by 1920, paralleling men's education, which increased from 45% to 66% during the same period. However, the growth in school infrastructure did not mirror this trend, with total schools per 10,000 inhabitants remaining relatively stable, from 31.2 in 1845 to 31.6 in 1908. While data on public schools was more limited, there appears to have been an increase from 1903 to 1908, although direct comparisons with 1845 are hindered by the lack of comprehensive records during that period.
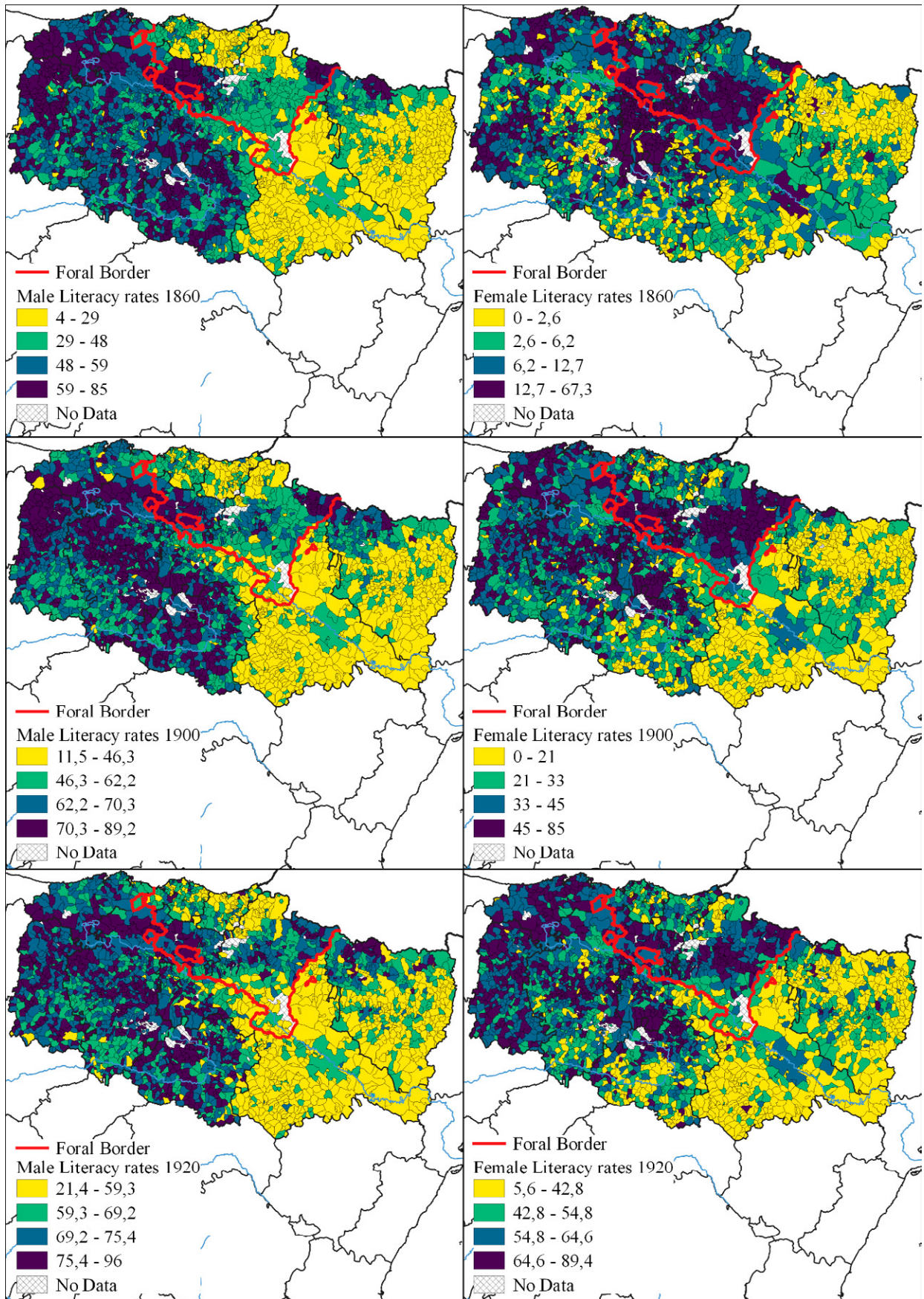
Figure 5. Quantile distribution of Male (left) and Female (right) literacy rates
Source: Own elaboration with data from Population censuses of 1860, 1900 and 1920.

Table 1.
Summary statistics

Towns within 20km to *foral* border	Towns within 20km to foral border					Common Towns					Foral Towns				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Male Literacy															
1860	451	44.8	15	4.1	83.5	266	44.2	16.2	4.1	83.5	185	45.6	13.1	13.5	73.3
1877	451	50.3	14.6	14	85.3	266	50.2	15.4	14	85.4	185	50.4	13.3	20.5	76.4
1887	451	53	14	18.5	83.1	266	52.9	14.9	20.5	83.1	185	53.1	12.5	18.5	80.9
1900	451	56.6	13.2	21.4	89.1	266	55.3	14.4	21.4	89.1	185	58.4	11.2	29.3	78.4
1910	451	59.9	12.2	21.5	83.4	266	59.2	13.6	21.5	83.4	185	61	9.8	32.3	83.3
1920	451	65.7	10.8	22.7	93.7	266	64.9	11.9	22.7	93.7	185	66.8	9.1	41.9	90
Female Literacy															
1860	451	13.2	9.2	0	51.2	266	11.8	9.7	0	51.2	185	15.1	8.1	0	42.1
1877	451	21.3	11.2	0	56.4	266	19.3	11.7	0	56.4	185	24.2	9.8	.8	44.5
1887	451	27.2	12.2	0.6	64.6	266	24.5	12.8	.6	64.6	185	31.2	10.2	3.7	55.3
1900	451	36.7	13.5	2.4	77.2	266	32.8	13.9	2.4	77.2	185	42.2	10.9	18.2	68.9
1910	451	45.3	14.1	2.7	86	266	42.8	15.8	2.7	86	185	48.8	10.4	24.2	74.4
1920	451	54.7	13.1	6.3	81	266	52.1	14.1	6.3	80.2	185	58.4	10.6	26.3	80.9
Schools															
Total Schools per 10,000 inhabitants 1845	451	31.2	25.3	0	162.6	266	29.4	26.9	0	162.6	185	27.9	21	0	124.2
Public Schools per 10,000 inhabitants 1903	451	28.2	16.9	0	99.5	266	28.4	17.3	0	99.5	185	27.8	16.4	0	90.9
Public Schools per 10,000 inhabitants 1908	451	30.2	18.2	0	108.7	266	31.1	17.5	0	98	185	28.9	19.2	0	108.7
Total Schools per 10,000 inhabitants 1908	451	31.6	17.4	0	108.7	266	32	16.8	0	98	185	30.9	18.3	0	108.7
Public expenditure per capita in 1908	451	2.7	1.1	0	7.8	266	2.9	1.2	0	7.8	185	2.4	.8	0	5
Public expenditure per school in 1908	451	1068.8	432.6	0	2807.7	266	1068.6	344	0	2546.8	185	1069.1	536	0	2807.7
Foral (Biscay)	451	0.1	0.3	0	1	—	—	—	—	—	185	.2	.4	0	1
Foral (Alava)	451	0.1	0.3	0	1	—	—	—	—	—	185	.3	.4	0	1
Foral (Navarre)	451	0.2	0.4	0	1	—	—	—	—	—	185	.5	.5	0	1

Regarding the difference between *common* and *foral* munic-
ipalities, the former consistently exhibited lower literacy rates
for both males and females from 1860 to 1920. However, *foral*
towns had a lower provision of schools, both in the mid-19th
century and the early 20th century. This is counterintuitive, as
a lower provision of schools should be associated with a re-
duced capacity of the population to acquire literacy. However,
as mentioned above, there was an important difference be-
tween the types of schools in *foral* and *common* provinces.
Foral provinces had non-gender segregated schools *(mixtas),*
while *common* provinces had separate schools for boys and
girls. Therefore, two schools (one for boys and one for girls) in
common municipalities would be counted as more schools,
showing a higher average in Table 1, while one *mixta* school in
foral towns would depict a lower average. However, as the
literacy rates show, especially for girls, more —and segregat-
ed— did not mean better.

4. Methodology. Spatial Regression Discontinuity Design

Following Dell *et al.* (2018), this study implements a SRDD
in order to understand how the *foral* system might affect ed-
ucation. Moreover, as spatial correlation was present in the
dependent variables under study (see Figures 4 and 5), I im-
plement a spatial econometric model, following the approach
to spatial discontinuity regressions used by Oto-Peralias
(2020). An OLS model has been used obtaining similar results,
although the spatial dependence makes the OLS coefficients
not trustworthy (see Anselin, 2003).

The spatial discontinuity regression design, therefore, fol-
lows this specification:

$$Educ_i = \alpha + \beta_1 \, Foral_i + \beta_2 \, Geographic \; location_i + \\ + \beta_2 \, segment_i + \rho W_D \, Educ_{i\text{-}D} + \beta_X X_i + \epsilon_i \quad (1)$$

$$\epsilon_i = \sigma W_D \, \mu_{i\text{-}D} + v_i \quad (2)$$

Where in equation (1) the dependent variable *Educ* is the
number of schools per 10,000 inhabitants and expenditure in
each town, or the literacy rate for each gender, female and
male, depending on the specification. *Foral* are the three vari-
ables of interest. Additionally, following Dell *et al.,* (2018) is the
linear polynomial in distance to the *foral* border, and repre-
sents the sector to which each town *i* belong. This variable
emulates a fixed effect as the boundary has been divided into
25 kilometres random segments in order to ensure that the
model compares similar municipalities belonging to the same
segment.

The spatial analysis developed in equation (1) relies on
different Spatial Weighted Matrix (W_D), where *D* represents
the different thresholds in kilometres[5]. In particular, two ele-
ments characterise the spatial dimensions of the model. First,
the model accounts for the spatial effect (coefficient ρ) that the
Educ variable of neighbouring municipalities *i-D* exerted on

the *Educ* variable of municipality *i*. As Figure 4 and 5 shows,
there were important high and low clusters in education pro-
vision and literacy rates; thus, this effect is expected to be
statistically significant. Finally, this specification also accounts
for a spatial error term, presented in equation (2), that reflects
spatial autocorrelation in the disturbance due to spatially clus-
tered omitted variables. For both the dependent spatial effect
(coefficient ρ) and the error spatial effect (coefficient σ), the
threshold used for the W_D is 50 kilometres, following Ashraf
and Galor, (2011) and Beltrán Tapia and Martinez-Galarraga
(2018)[6].

Equation (1) also includes as a set of the following set of
control variables: population density, speaking euskera and in
natural logarithms are included population, average precipi-
tations, distance to railroad and the percentage of population
living in disperse settlements within each municipality in
1887. Moreover, following Oto-Peralías (2019) a dummy vari-
able taking 1 if the municipality was under royal jurisdiction
and 0 if it was not during the late-18th century, obtained from
the information contained at municipality level in the *Florid-
ablanca Census* of 1787[7].

The key assumption is that all relevant factors besides being
foral change smoothly at the border. To verify this, it must be
confirmed that municipalities on both sides of the border are
similar. This verification is presented in Figure 5, which dis-
plays the coefficients of the *Foral* variable in equation (1), using
altitude, roughness, wheat suitability, distance to a major riv-
er, average yearly temperature, and average yearly precipita-
tions. This Figure gives us the bandwidth at which *foral* towns
were geographically different from *common* municipalities.
The graphs show that there was a statistically significant dif-
ference between *foral* and *common* towns in altitude and
wheat suitability when the sample is expanded to higher
thresholds, and for all bandwidths in precipitations. Therefore,
following these results, the bandwidth is set to 20 kilometres
to the *foral* border[8]. Although *foral* towns seem to have more
precipitations, this bandwidth will allow having a subsample
of towns close to the *foral* border that were similar to each
other, which together with the segment fixed effects, provide
more robust results for the *Foral* variable. Therefore, this meth-
odology allows for the comparison of almost identical munic-
ipalities, with the only exception being their institutions. For
instance, a town in Alava with one *mixta* school should be
providing the same number of schools (one) as an identical
town on the other side of the border if institutions did not
matter.

[5] The W_D is constructed as follows, taking 25 kilometres as *D*: each munic-
ipality (observation) has a row, assuming our matrix with 451 rows, each
row (municipality) has as many columns as municipalities (observations),
again 451 columns, thus, our W_D is a 451x451 matrix. As the threshold is
set at 25 km, each row/municipality will have each of its columns different
from zero if that column (municipality/observation) is within 25 km of
that row/municipality.

[6] I analysed the data with a distance matrix ranging from 25 to 200 kilo-
metres, and the results were similar to those presented here for 50 kilo-
metres. The only difference was that the coefficients for the error and de-
pendent variable lags decreased from the minimum distance to the maxi-
mum distance, confirming that the spatial correlation (for both the error
and the dependent variable) is weaker, as broader regions were taken into
account.

[7] The coding for a municipality speaking Euskera comes from the map
Carte des sept Provinces Basques elaborated by Louis-Lucien Bonaparte in
1863. The rest of the data has been kindly provided by the Economic His-
tory group of the Universitat de Valencia Cite (Beltrán Tapia *et al.,* 2021
and Beltrán Tapia *et al.,* 2022).

[8] Nevertheless, bandwidths from 10 to 60 kilometres have been used get-
ting similar results. Due to the limitation of data availability from the
Madoz Dictionary mentioned in the second section, these bandwidths are
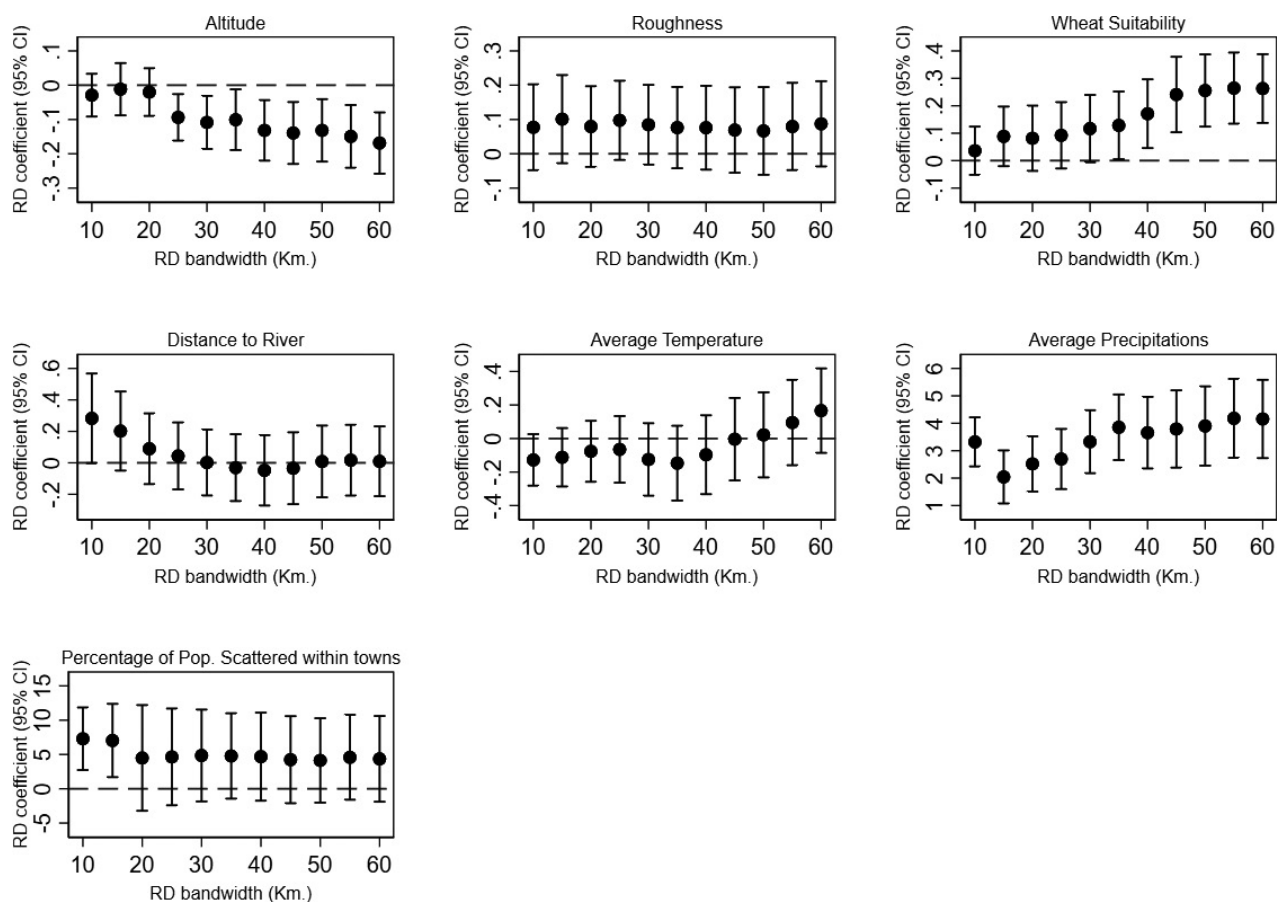not tested for the number of schools in 1845.

Figure 5. Geographical check. Coefficients of *Foral*
Source: Own elaboration.

5. Results and Discussion

This section examines the effect of the *foral* system on education through the 19th and early 20th centuries. It begins by presenting the results of equation (1), using education provision in 1845, 1903, and 1908 as the dependent variables, followed by the coefficients for female and male literacy rates. The section concludes with a discussion of the findings.

5.1. Education Provision

Table 2 shows the results of the education provision during the mid-19th and the early 20th centuries. Among the *foral* towns, only Navarre had a higher number of schools in the mid-19th century, with 20.5% more schools per 10,000 habitants than an average *common* municipality at the other side of the border, which is obtained using the coefficient for Navarre in table 2, column (1), and the mean total schools for *common* towns in Table 1.

Despite this positive outcome in the mid-19th century for Navarre, a shift in the educational landscape becomes evident by the early 20th century, as indicated from columns (2) to (6). Navarre demonstrates a notable decrease in educational provision in 1903 and 1908, with around 20% less schools than an average *common*. This disparity is further underscored by the reduced expenditure on public education by municipalities in Alava and Navarre. Conversely, Biscay witnessed a surge in expenditure, with 16.7% higher expenditure for each of its public schools, which could be attributed to the significant changes that happened in the province since 1880s, as highlighted by Palacios-Mateo (2023b).

5.2. Literacy Rates

Table 3 depicts the results for the female and male literacy rates, showing the evolution through the different institutional periods described in Section 3. Column (1) presents the results for a scenario when the Law of 1857 could not yet have had an effect. These results could be attributed to the effect of *mixta* schools, derived from the policies described in Section 2 in Alava and Navarre, and seen in the results of Table 2, column (1).

Columns (2) to (4) span a period when the political privileges for the *foral* provinces were abolished, the Educational Law had been implemented for at least 20 years, and towns had to fund primary education with their own resources. During this period, due to the nature of literacy rates, a residual effect of *mixta* schools on women's education in Alava and Navarre can be seen. The increasing coefficients were reflected in a constant higher female literacy rate, going the values for Navarre from a 31.4% higher than the average *common* municipality in 1877 to 29.6% in 1900.

The last two columns record the coefficients when primary education was effectively funded by the State in *com-*

Table 2.

Foral Effects on Education Provision

	1845	1903		1908		
	Total schools/pc	Pub school/pc	Pub school/pc	Total schools/pc	Public exp./pc	Public exp/ school
	(1)	(2)	(3)	(4)	(5)	(6)
Foral (Biscay)	1.319	-2.806	-3.627	-6.402*	0.151	178.351**
	(4.178)	(2.850)	(3.060)	(3.334)	(0.184)	(72.049)
Foral (Alava)	-1.550	-1.993	-2.234	-2.617	-0.634***	-136.656***
	(4.031)	(1.979)	(1.878)	(1.868)	(0.143)	(36.555)
Foral (Navarre)	6.038**	-4.916***	-7.751***	-7.416***	-1.034***	-123.694***
	(3.039)	(1.604)	(1.425)	(1.486)	(0.128)	(34.857)
Aragón	10.692***	-1.572	-2.098	-4.596**	-0.490***	-178.968***
	(4.097)	(2.292)	(2.062)	(2.102)	(0.184)	(57.693)
Euskera	-14.235***	-0.985	-1.560	-3.769	-0.143	152.525*
	(4.193)	(2.968)	(3.139)	(3.081)	(0.199)	(91.186)
Royal Domain	7.690***	3.580***	3.739***	3.549***	0.144	-5.852
	(2.063)	(1.317)	(1.214)	(1.172)	(0.097)	(23.691)
Average Precipitation	0.613**	0.842***	0.937***	0.956***	0.032***	-9.964***
	(0.251)	(0.156)	(0.157)	(0.155)	(0.012)	(2.895)
% Living not centre	0.266***	0.185***	0.247***	0.238***	0.007**	-5.187***
	(0.064)	(0.040)	(0.043)	(0.043)	(0.003)	(0.604)
Distance to foral border	0.246	-0.149	-0.027	-0.065	-0.013	1.972
	(0.170)	(0.105)	(0.106)	(0.108)	(0.008)	(2.014)
Population Density	-0.006*	0.002	0.002	0.002	0.000	0.062
	(0.003)	(0.002)	(0.002)	(0.002)	(0.000)	(0.056)
Population (ln)	-12.932***	-10.897***	-10.462***	-9.440***	-0.449***	316.981***
	(1.573)	(0.886)	(0.899)	(0.895)	(0.060)	(16.550)
Distance to Railroad		-0.696	-0.973	-1.125	0.070	3.676
		(0.606)	(0.692)	(0.699)	(0.051)	(16.800)
Dependent variable spatially lagged	-0.027	-0.026	-0.001	-0.003	0.005	0.004
	(0.032)	(0.024)	(0.021)	(0.022)	(0.018)	(0.012)
Error Spatial Lag	-0.196**	-0.303***	-0.315***	-0.306***	-0.147	-0.331**
	(0.099)	(0.109)	(0.117)	(0.110)	(0.129)	(0.156)
Obs.	451	451	451	451	451	451
Pseudo-R^2	0.523	0.600	0.642	0.615	0.431	0.744

Constant omitted. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

mon provinces in 1910, and in 1920 for *foral* provinces. In this case, Alava's coefficients for females are no longer statistically significant, those for Biscay are negative, and those for Navarre have almost halved. The lowest point was in 1910, after almost a decade of foral municipalities funding primary education, whereas it was centralized for *common* towns.

The results for Biscay deserve special attention. While the other two *foral* provinces benefited from their policies and having a border with *common* provinces without *mixta* schools,

Biscay had neither of these features. Moreover, the negative results for male literacy rates confirms the results obtained by Palacios-Mateo (2023a), as he finds that the mining sector, which was significantly important in Biscay, had a significant negative impact on literacy rates. Furthermore, as stressed by Pérez-Fuentes Hernández (2003) the significant population increase since the 1880s in Biscay towns, led to overcrowded schools and an increasing the demand for minor tasks within the mines and at home, which particularly affected girls, as depicted in Panel A.

Table 3.
Foral Effects on Literacy

	Female Literacy Rates					
Panel A	**1860 (1)**	**1877 (2)**	**1887 (3)**	**1900 (4)**	**1910 (5)**	**1920 (6)**
Foral (Biscay)	0.982	-0.325	-1.829	-3.322	-16.309***	-7.606***
	(1.865)	(2.620)	(2.602)	(2.520)	(3.826)	(2.585)
Foral (Alava)	3.363***	3.527**	6.567***	5.585***	1.029	1.417
	(1.061)	(1.534)	(1.527)	(1.569)	(1.514)	(1.492)
Foral (Navarre)	4.487***	6.063***	7.929***	9.711***	5.717***	6.532***
	(1.104)	(1.481)	(1.432)	(1.558)	(1.870)	(1.672)
Aragón	-2.207*	-2.249	-4.586**	-4.249*	-6.166**	-4.577*
	(1.173)	(1.708)	(1.826)	(2.180)	(2.606)	(2.444)
Euskera	-5.038***	-6.512***	-0.678	1.291	0.761	-3.084
	(1.432)	(2.194)	(2.403)	(2.628)	(2.793)	(2.499)
Royal Domain	0.769	1.355	1.165	0.877	1.150	1.166
	(0.667)	(0.831)	(0.935)	(0.995)	(1.128)	(1.082)
Average Precipitation	-0.040	0.026	0.010	0.040	0.238*	0.183
	(0.073)	(0.105)	(0.117)	(0.121)	(0.138)	(0.129)
% Living not centre	-0.084***	-0.084***	-0.089***	-0.058**	-0.056*	-0.038
	(0.018)	(0.024)	(0.024)	(0.027)	(0.030)	(0.026)
Distance to foral border	0.152***	0.170**	0.093	0.096	0.071	0.127
	(0.045)	(0.072)	(0.071)	(0.080)	(0.094)	(0.079)
Population Density	0.000	-0.000	0.000	0.000	0.001	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population (ln)	2.747***	3.146***	3.263***	2.285***	1.410**	0.980
	(0.362)	(0.475)	(0.532)	(0.572)	(0.688)	(0.618)
Distance to Railroad		0.799	3.104***	2.692***	1.220*	1.410**
		(0.602)	(0.516)	(0.526)	(0.634)	(0.647)
Dependent variable spatially lagged	0.125***	0.113***	0.091***	0.077***	0.049***	0.023**
	(0.019)	(0.020)	(0.015)	(0.013)	(0.013)	(0.010)
Error Spatial Lag	-0.142	0.032	0.036	0.008	0.070	0.048
	(0.104)	(0.083)	(0.092)	(0.119)	(0.100)	(0.096)
Obs.	451	451	451	451	451	451
Pseudo-R^2	0.586	0.568	0.564	0.565	0.541	0.514
	Male Literacy Rates					
Panel B	**1860 (7)**	**1877 (8)**	**1887 (9)**	**1900 (10)**	**1910 (11)**	**1920 (12)**
Foral (Biscay)	-11.165***	-6.921***	-9.520***	-2.401	-9.193***	-4.247**
	(3.041)	(2.249)	(2.071)	(2.410)	(2.288)	(1.747)
Foral (Alava)	2.071	1.945	0.987	2.436*	-0.534	0.290
	(1.915)	(1.359)	(1.300)	(1.371)	(1.118)	(1.147)
Foral (Navarre)	1.107	1.145	0.754	2.474	3.068**	1.109
	(1.874)	(1.489)	(1.193)	(1.571)	(1.262)	(1.457)
Aragón	-12.739***	-8.684***	-9.661***	-8.432***	-5.446**	-6.896***
	(2.693)	(2.170)	(1.862)	(2.448)	(2.158)	(2.415)

	Male Literacy Rates					
Panel B	**1860** **(7)**	**1877** **(8)**	**1887** **(9)**	**1900** **(10)**	**1910** **(11)**	**1920** **(12)**
Euskera	-6.124**	-6.987***	–5.267*	-2.670	-4.052*	-3.172
	(2.826)	(2.573)	(2.819)	(2.475)	(2.450)	(2.116)
Royal Domain	1.277	0.758	0.625	-0.336	0.131	-0.474
	(1.070)	(0.866)	(0.868)	(0.950)	(0.979)	(0.874)
Average Precipitation	0.362***	0.482***	0.413***	0.291***	0.309***	0.319***
	(0.120)	(0.105)	(0.102)	(0.103)	(0.113)	(0.116)
% Living not centre	-0.036	-0.052**	-0.024	-0.029	-0.009	-0.035
	(0.023)	(0.025)	(0.022)	(0.021)	(0.026)	(0.022)
Distance to foral border	0.340***	0.306***	0.279***	0.313***	0.142*	0.119*
	(0.084)	(0.075)	(0.064)	(0.070)	(0.077)	(0.067)
Population Density	-0.001	-0.002*	0.000	0.002	0.002	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population (ln)	-0.227	-0.285	0.208	0.395	-0.790	-0.429
	(0.583)	(0.569)	(0.505)	(0.515)	(0.534)	(0.490)
Distance to Railroad		1.468**	2.045***	1.912***	0.765	0.906*
		(0.672)	(0.471)	(0.458)	(0.511)	(0.509)
Dependent variable spatially lagged	0.041***	0.034***	0.043***	0.037***	0.030***	0.019***
	(0.012)	(0.009)	(0.008)	(0.008)	(0.008)	(0.006)
Error Spatial Lag	0.035	0.015	0.076	0.030	0.137	0.179*
	(0.081)	(0.074)	(0.120)	(0.115)	(0.120)	(0.106)
Obs.	451	451	451	451	451	451
Pseudo-R²	0.702	0.731	0.735	0.658	0.585	0.539

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.3. Discussion

The results of Tables 2 and 3 present an interesting picture of the Spanish educational system. The effect of *mixta* schools observed in Section 3 and in Table 1 does not appear in the results for education provision. While Table 1 suggests that there would be fewer schools per capita in the *foral* provinces in the mid-19th century due to municipalities providing one *mixta* school instead of separate schools for boys and girls, the results in Table 2 do not support this. In fact, there was a similar provision along the Biscay and Alava border, with a significantly higher provision in the Navarrese part, especially near the border with Aragon. This might indicate that while *foral* provinces (and Cantabria and Soria) provided one *mixta* school where boys and girls could be educated, *common* municipalities were only providing one school for boys, the only education that was mandatory to provide before the Law of 1857.

Thus, the results for 1903 and 1908 mirror the shift in education policy initiated by *foral* regional governments since the mid-19th century. As elucidated in Section 2, these governments perceived national laws as intrusions on their traditions, freedoms, and governance. Henceforth, as primary schooling was a key element of culture and education, these governments actively resisted the application of national educational laws in the *foral* provinces. Consequently, as the Spanish

primary education system began to be implemented nationwide with the enactment of the Educational National Law in 1857, *common* provinces witnessed a surge in educational provision. For instance, while in 1845 there were, on average, 27.4 schools per 10,000 inhabitants in the border towns of the *common* province of Rioja, and 27.6 in Navarre, by 1908, the latter saw an increase to 28.5 schools, while Rioja's provision had risen to 31 schools per 10,000 inhabitants.

Hence, the shifting pattern in Navarre's education provision and the negative results for early 20th century Alava suggest a complex trajectory. While foral municipalities benefited from better or comparable education provision before the effective implementation of the National Education system in Spain in 1857, this was largely due to the early emphasis on education by foral institutions, particularly in regard to women's education. However, this advantage began to decline during the late 19th century.

This could be also seen in the results for literacy rates. The significant differences observed across the various periods highlight the impact of educational policies and institutional conflict. In the first period, when the National Law had not yet taken effect, the impact of *mixta* schools, as highlighted by Sarasua (2002), positively influenced women's education. This is further confirmed by the lack of a positive effect in Biscay. This *foral* province shares most of its border with Cantabria, another province with *mixta* schools; therefore, municipalities

on both sides of the border exhibit a similar effect of *mixta* schools on female education.

During the last quarter of the 19th century, when the Law of 1857 was fully implemented in the country, the decentralization funding might still prevent some *common* town council to able fully implement the Law. This was reflected in lower female literacy rates in these municipalities. Moreover, the institutional conflicts during the first years of the 20th century affected the higher female literacy rates in Alava and Navarre, as better-paid teachers and funded schools in *common* municipalities seem to have narrowed the literacy gap during these years.

Although the results regarding education are linked to institutions, it could be argued that economic progress also played a role. Greater economic development in the foral territories would likely have led to different outcomes. The *foral* privileges, which lasted until the 1870s, followed by the *Concierto*, allowed these territories to experience lower overall fiscal pressure and higher public expenditure on local affairs compared to *common* towns throughout the period under study. This may have contributed to better economic development. Consequently, one would expect a consistently positive effect on educational outcomes, as economic development would continuously drive an increase in the educated population throughout the period. This effect would be particularly notable in Biscay, where, as Alonso Olea (1995) argues, the *Concierto* significantly benefited industrialization, which is the opposite result obtained here.

In conclusion, the results of Tables 2 and 3 present an interesting picture of the Spanish educational system. Provinces that provided education for girls in *mixta* schools showed higher levels of women's education during the 19th century. This corroborates previous findings by Sarasúa (2002) and highlights the importance of non-gender-biased education for girls to achieve increasing literacy rates before the effective implementation of national educational laws. However, once the State mandated the provision of education for both girls and boys, the literacy gap receded. Although until 1900, *foral* municipalities in Alava and Navarre still had significantly higher female literacy rates, by 1910 and 1920 there was a clear turning point, depicted in the literacy rates and in the school provision. This period was characterized by a conflict between the *foral* regional governments and the State, which obstructed the centralization of teachers' salaries from 1902 to 1912. This caused the higher female literacy rates in Navarre to halve, the advantage in Alava to disappear, and Biscay towns to have lower literacy levels than *common* municipalities in 1910 and 1920.

6. Conclusion

Until 1936, four Spanish provinces maintained a set of institutions enabling them to exercise relative political and economic autonomy for much of the period under study. Utilizing an SRDD, this study compares municipalities in these provinces with similar Spanish counterparts from the late 19th and early 20th centuries situated on the opposite side of the border, with institutions being the sole significant point of differentiation. Consequently, this article examines how regional institutions may have promoted human capital during the 19th century in the absence of effective Nation-State expansion. However, as the State developed during this period, education emerged as a tool to strengthen the Nation-State concept. This

led to conflicts between the State and entrenched regional institutions, illustrating an example of the institutional conflict theory developed by Acemoglu (2003) regarding societies' selection of policies.

In conclusion, this paper underscores the significant role of institutions in driving the expansion of education. During a period marked by the limited development of the Spanish State apparatus, *foral* institutions in Alava and Navarre facilitated the education of women through the *mixta* schools. However, as the Spanish State expanded, the *foral* institutions viewed this as a potential threat to the continuity of the *foral* system. Thus, these institutions sought to impede the effective implementation of State bureaucracy, administration, and laws within their territories. Consequently, it was the population in these regions that bore the direct burden of the conflict. As a result, *foral* municipalities lagged behind as *common* towns narrowed the educational gap evident in the mid-19th century.

However, this narrative also carries elements of success. As Pro Ruiz (2019) and del Moral Ruiz (2007) have emphasized, the development of the Spanish State encountered considerable challenges throughout the 19th century. Yet, and similar to the conclusion obtained by Beltrán Tapia *et al.,* (2023), regarding education, *common* municipalities managed to equalize with highly educated *foral* towns. This achievement likely stemmed from the concerted efforts of *common* town councils, the effective implementation and evolution of education inspections, and, since 1902, the endeavours of the Ministry of Education, thanks to the centralization, similar to the results obtained for Italy by Cappelli (2016) and Cappelli and Vasta (2020).

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