# Knowledge Elites and Modernization: Evidence from Revolutionary France*

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**Abstract**

This paper examines the role of knowledge elites in modernization. At the eve of the French Revolution, in the spring of 1789, King Louis XVI solicited lists of grievances (*Cahiers de Doléances*), in which the public could express complaints and suggestions for reforms of the Ancien Regime. We show that the demand for mass education and democratization was particularly high in regions that had a thick knowledge elite, measured by subscribers to the famous *Encyclopédie* in the 1770s. Historical evidence suggests that this pattern is driven by the spirit of enlightenment of French knowledge elites. Pre-revolution literacy, in contrast, is not correlated with demand for mass education or with the density of knowledge elites. After the French Revolution, knowledge elites played a key role in implementing schooling reforms at the local level. We show that by the mid-19th century, schooling rates were significantly higher in regions with thicker knowledge elites. The same is true of other proxies for modernization, such as association membership, Republican votes, and the share of French-speaking pupils. Our results highlight an important interaction between local culture (the spirit of enlightenment) and nation-wide institutions in economic development: the French Revolution opened a window of opportunity for local elites to pursue their agenda of modernization.

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# 1 Introduction

A large literature has documented that democratization and education are crucial factors in economic development. However, the historical roots for this process of modernization are subject to debate (Acemoglu, Gallego, and Robinson, 2014). Following North and Thomas (1973), Acemoglu and Robinson (2012) argue that institutional change is the deep cause of development, with mass education as a by-product. In this context, a prominent explanation for democratization is that, under the threat of revolution, ruling elites introduced democracy as a commitment for redistribution (Acemoglu and Robinson, 2000). Alternative explanations argue that democratization can also occur absent such threats, because it stimulates public goods provision (such as public health or mass education), which may favor elites indirectly (Galor and Moav, 2002; Lizzeri and Persico, 2004). On the other hand, the 'modernization hypothesis' following Lipset (1959) holds that institutional change was a by-product of a broader process of economic development. According to this explanation, mass education (which in turn was triggered by economic growth) 'prepared' people for democracy and thus created the basis for institutional change. These explanations have in common that they implicitly assume a latent demand for democratization by the disenfranchised, either already before economic development took off, or as a consequence thereof. However, there is no systematic empirical work that examines this 'demand side' during the period of modernization in the Western world.[1] Instead, the literature has largely focused on the 'supply' of democratization and education.

In this paper, we examine the interplay of demand for societal change and subsequent modernization at a critical juncture of history – the French Revolution in 1789. In light of rising tensions in French society, King Louis XVI requested the *Cahiers de Doléances* ("letters of grievances") in 1788 from each of the three estates – clergy, nobility, and third estate (all others). These contained complaints, but also suggestions and demands for changes in the organization of French society. Thus, the *Cahiers* provide a unique source for the analysis of the 'demand side' for societal change in an autocratic regime. Using detailed data for more than 233 districts, we first document that demand for modernization was small among the lower social classes. For example, only 24% of third-estate *Cahiers* mentioned a national education system, and 29% had a distinguished democratic character. However, we also find a strong relationship between the local presence of knowledge elites and demand for modernization.[2] This is in line with historical accounts that enlightened elites promoted institutional change and the expansion of education. In contrast, initial

[1] In the modern context, Acemoglu and Robinson (2012) discuss the demand for institutional change among protesters during the Arab Spring.

[2] We use the local density of subscribers to the famous *Encyclopédie* in 1777-80 as a proxy for knowledge elites, following Squicciarini and Voigtländer (2015).

literacy of the population in 1786 is not associated with demand for mass education, although it does predict demands for democratization.

We then study the relationship between pre-Revolution knowledge elites and post-Revolution modernization, exploiting the rich variation in numerous socio-economic outcomes across France. We document a strong correlation between knowledge elites and the expansion of education at the local level. This relationship was particularly strong during periods in which the central government pursued schooling policies. Thus, our results point to an interesting interaction between the *local* demand for societal change and *aggregate* institutions that seek to promote modernization. This complements a nascent literature that emphasizes the interaction between nation-wide institutions and local culture (Tabellini, 2008; Alesina and Giuliano, 2015; Bisin and Verdier, 2015). We also show that the presence of knowledge elites is strongly associated with other indicators of modernization and state-building in the mid-19th century: the share of French-speaking school children, the density of mutual aid societies (as a proxy for the strength of civic society – cornerstone of democracy), and votes for progressive political parties.

What explains the strong relationship between knowledge elites and modernization in France? We discuss a rich historical literature that emphasizes the role of enlightened elites in implementing nation-wide reforms at the local level – especially those that sought to foster mass education. For example, Anderson (1975, p.31) observes that the school reform of 1833 – a milestone in French education policy – "relied on the voluntary effort of local notables to organize and develop education, both in the communes and through committees set up to supervise schools over a wider area." In turn, our results suggest that the relationship between knowledge elites and later indicators for modernization in the mid-19th century is driven by the increase in schooling. This supports an interpretation whereby knowledge elites promoted the spread of education, which in turn fostered modernization among dimensions such as state building or social capital. There is potentially also an indirect channel because knowledge elites fostered economic development (Squicciarini and Voigtländer, 2015), which in turn promoted modernization as in Lipset (1959). Economic development gave rise to demands for the socialization of workers, instilling morale and discipline. However, it is unlikely that this mechanism alone explains our findings – our results hold also after controlling for development indicators such as income per capita and urbanization. Similarly, economic development – fostered by knowledge elites – may have raised skill demand, thus creating incentives for schooling expansion (Galor and Moav, 2006). This is also relatively unlikely: the main schooling expansion occurred during the July Monarchy between 1833 and 1848, and thus during the 'first industrial revolution', which saw stagnant or even *declining* skill premia (Clark, 2005).[3] Finally, our results may be driven by unobserved variables (such as local economic poten-

[3]We use detailed district-level wage data to confirm this pattern: the skill premium in 1839-47 was actually *lower*

tial) that are correlated with both modernization outcomes and knowledge elites. This is unlikely for two reasons: first, pre-Revolution literacy is uncorrelated with the presence of knowledge elites; this relationship only emerged after the schooling reforms in the 1830s. Second, knowledge elites are not associated with economic development in France before 1750 (Squicciarini and Voigtländer, 2015). Consequently, the relationship between knowledge elites and modernization likely emerged after the French Revolution. In sum, the most likely interpretation for our findings is that knowledge elites fostered the implementation of education policies at the local level – especially during periods when nation-wide institutions allowed for a role of elites. Education, in turn, fostered other dimensions of modernization such as state building, progressive political views, and social capital.

Our paper relates to a large literature that examines the role of institutions versus human capital as drivers of economic growth and development. Lipset (1959, 1960) brought the modernization hypothesis into prominence (crediting it in turn to Aristotle), arguing that economic development is accompanied by improvements in education, which in turn provides the basis for institutional change and a transition to democracy. This view has received empirical support in cross-country and panel regressions (Easterlin, 1981; Barro, 1999; Glaeser, La Porta, Lopez-de-Silanes, and Shleifer, 2004; Barro, 2015).[4] On the other hand, a prominent literature has opposed this view, arguing that country-level unobservables – in particular, institutional quality – are the fundamental drivers of development (Acemoglu and Robinson, 2012).[5] On the theory side, Bourguignon and Verdier (2000) provide a model where education raises citizen's political participation. When elites decide to extend education to the masses, they thus face a trade-off between economic development and loss of political control. Glaeser, Ponzetto, and Shleifer (2007) make a related point, providing a model where schooling fosters social interaction, facilitating the transition to a democratic regime with a broad base in the population. Overall, the previous literature has mostly studied democratic transitions and development over the past decades, when rich data are available. In the historical

in areas with dense knowledge elites.

[4] Castelló–Climent (2008) provides evidence that mass education is a more robust predictor than average years of schooling for democratization after WWII. While average years of schooling may reflect a small group of highly educated individuals, accounting for the distribution of education captures whether a large mass has moderate education, enabling the citizens to participate in the democratic process.

[5] The debate has largely involved country level panel regressions, and whether or not the inclusion of fixed effects is required. Glaeser et al. (2004) find that human capital coefficients dominate those on institutions in cross-country growth regressions, while Acemoglu et al. (2014) argue that this is due to omitted variable bias and the "bad control" problem (Angrist and Pischke, 2009, pp.64–68). Acemoglu, Johnson, Robinson, and Yared (2009) show that once country fixed effects are included, income does not predict transitions to democracy. Hauk and Wacziarg (2009) show that fixed effects estimators bias the coefficient on human capital towards zero, while purely cross-sectional estimates bias it upward. On balance, their Monte Carlo simulations advise against the use of fixed effects in panel regressions: while they reduce omitted variable bias, they exacerbate downward bias due to measurement error in variables that change little over time, such as educational attainment.

context, the literature has focused mainly on whether colonizers brought institutions or human capital to colonies. Empirically, the development of the first democracies in Europe has been largely unexplored. We fill this gap by examining detailed cross-sectional variation within France during the period of the French Revolution.

We also relate to a literature that has studied the role of elites in the expansion of education and democratization. Sokoloff and Engerman (2000) argue that inequality can hamper economic opportunities for the majority of the population if it leads to the emergence of institutions that favor elites. Easterly (2007) uses cross-country data and finds that land inequality is negatively correlated with income, institutions, and schooling. Galor, Moav, and Vollrath (2009) show in a theoretical framework, then tested in the context of 20th-century US, that landownership inequality has a negative effect on the emergence of public schooling and human capital promoting institutions. (Cinnirella and Hornung, 2016) take a slightly different approach and show that in the case of Prussia, landownership inequality had a negative effect on mass education not through the political power of the elites, but through the serfdom system diminishing private demand for education.

Relative to the existing literature, we make several contributions. First, we examine the demand for societal change *before* one of the turning points in history – the French Revolution – and show that enlightened elites were an important driving force in seeking to expand education and democratize the country. Second, in contrast to the previous literature, we examine the spread of modernization *within* a country, exploiting substantial variation across French departments. Our findings expand on the argument by Acemoglu and Robinson (2012) that "critical junctures" in history can lead to very different long-run outcomes, depending on initial conditions. We argue that changes in central institutions opened a window of opportunity for local elites to implement modernization – and that the presence of knowledge elites can thus explain (at least in part) the substantial cross-sectional variation over the century after the French Revolution. Third, we document a pattern of 'modernization with a twist.' While the literature following Lipset (1959) has emphasized the importance of mass education for democratization, our results go one step further, suggesting that enlightened knowledge elites played an important role in both the initial demand for societal change and its later implementation at the local level. Finally, we contribute to the literature on the role of elites in economic development. In this context, we emphasize the importance of distinguishing between *enlightened* elites and landowning elites, showing that the former are in fact positively related with demand for and implementation of mass education and democratization. This suggests that the *type* of elites is crucial for whether they hamper or foster economic development.

The rest of the paper is organized as follows. Section 2 discusses the historical background of the French Revolution and the subsequent modernization of the country. Section 3 presents our

data, and Section 4, our empirical results. Section 5 concludes.

# 2 Historical Background

## 2.1 The Cahiers des Doléances

At the eve of the Revolution, Louis XVI, confronted with a general discontent of the population, decided to call the Estates General (the French representative assembly) for the first time since 1614. Each Estate (clergy, nobility, and third estate) in every *baillage* (electoral district) organized an assembly and endorsed a *cahier*. This was a list of grievances and suggestions on several aspects of the social, economic, and political situation of the country. Each assembly elected representatives who carried the *cahier* to the Estates General in Versailles.[6] Importantly, the *cahiers* did not have a legislative function, but simply represented a channel of communication.

The convocation rules varied by estate: while all members of the clergy and the nobility were called to participate, there were stricter regulations for the members of the third estate. For instance, only male citizens who were on the tax roles and older than 25 could participate. In addition, some cities such as Paris imposed a minimum tax requirement, which further reduced the size of the electorate from the third estate. Moreover, given the large number of individuals in the third estate[7], a sequence of elections was required, where cities and rural communities followed different procedures. Importantly, despite these differences among estates, "the *cahiers* embodied the will of the community that endorsed it" (Shapiro, Tackett, Dawson, and Markoff, 1998, p.105), and "the elections of 1789 allowed a very wide suffrage, unprecedented for France if not for Europe and far more inclusive than the British parliamentary model of the time" (Shapiro et al., 1998, p. 108).

## 2.2 The French Revolution

The French Revolution represents one of the "critical junctures" in European history (Acemoglu and Robinson, 2012) and its causes, characters, and consequences have been object of a long debate by historians and economists. It is widely accepted that the French Revolution was associated with a drastic institutional change in France that also had consequences in Europe as a whole. This included the abolition of the feudal system, as well as the simplification of the legal system (Franck and Michalopoulos, 2016, p.1). The objective of the revolutionary movement was to free the population from tyranny, and enlightened elites were at the forefront. They represented a

[6] These representatives were tied to the constituents in their *bailliage* not by future election, but only by the *cahier* itself.

[7] In 1789, France had about 23 to 26 millions inhabitants. The nobility represented between 150,000 and 300,000 members, the clergy around 100,000 members, and the Third Estate the rest of the population (Franck and Michalopoulos, 2016).

progressive group in society, identifying themselves more with the Nation than with the king, and even promoting the renunciation of some of their most substantial real privileges (Chaussinand-Nogaret, 1985). Our findings highlight the role of knowledge elites in the process of modernization after the French Revolution.

### 2.3 The French Schooling System in the 18th and 19th Century

Before the French Revolution, primary education was mainly under the control of the Catholic Church and was focusing on "the principal mysteries of the Catholic, Apostolic, and Roman religion" (Stone, 1922, p.165). While some reading was included in the school curriculum, very little emphasis was given to writing; the quality of teaching was very poor and school rates extremely low. At the eve of the French Revolution, "the instruction of the mass of the poor remained very nearly what it had been in the middle ages" (Arnold, 1961, p. 21).

The revolutionary government, inspired by the principles of the Enlightenment, attempted to reform the backward primary education system. The idea was that children of all classes were to receive free education in "those traits of virtue which most honor freemen ... to elevate the soul and to render men worthy of liberty and equality" (Arnold, 1961, p. 25). This had to be implemented and organized at the local level by a "commission of enlightened patriots and moral persons" who would decide where to locate schools and choose the future teachers. However, the turmoil during the Reign of Terror (1793-94), as well as the shortage of funding needed to promote the educational reforms, led to the Law of the 3rd Brumaire (1795) – and to the moment when the Revolution "had to renounce almost all its illusions" (Arnold, 1961, p.29). The State now would only provide a schoolhouse, but did not guarantee free schooling, while letting the parents decide on their children's education.

The suppression of religious teaching during the revolutionary period led to disorders and complaints, with the consequence that Napoleon, allowed the Church to reestablish its hegemony in primary education in 1799-1815. Moreover, while Napoleon recognized the importance of primary education, he gave priority to secondary education and Universities (Arnold, 1961; Jacob, 2014). After Napoleon, during the period of the Bourbon Restoration (1815-1830), the Church became even more influential in primary education, with local priests taking full control of the curriculum and certifying the morality of primary school teachers. As a consequence, in 1830, primary "education was in a deplorable state" (Arnold, 1961, p.46) with only 20,000 out of 37,000 communes having schools at all.

The turning point came with the July Monarchy (1830-1848). Primary schooling finally became a priority for the French government and an important law – aimed at a serious reformation of the education system – was enacted by François Guizot in 1833. Overall, the 1833 law was

extremely successful, and it resulted in "the root of the present system of primary education" (Arnold, 1961, p.46).[8] Importantly for our argument, the 1833 law largely relied on the implementation by local authorities: two committees (a parish and a district committee) were established to inspect and superintend schools, as well as to nominate and dismiss teachers. The ability of these committees largely varied at the local level and despite the fact that Guizot made several efforts to "stimulate and enlighten them" (Arnold, 1961, p. 46), the inadequacy of the local authorities often represented the main defect of the system. Anecdotal evidence suggests that often there was widespread local resistance toward the adoption of mass education.[9] This local heterogeneity was also reflected in the funding to schools. Until 1855, the commune contributed about 75% of the total expenditures. Only, in the early 1860s, there was a shift of financing from the local to the national level and, thus, less scope for local elites to affect the implementation of education reforms (Grew and Harrigan, 1991).

With the 1851 Falloux Law[10] and, even more, with the advent of the Third Republic[11] the education system became increasingly centralized and professional, with less scope for local authorities to affect the provision and quality of primary education. Thus, the period between 1830 and 1850 offered the most opportunities for local knowledge elites to affect the expansion of schooling.

## 3 Data

In this section we describe our data.[12] We begin with the description of our proxy for the presence of knowledge elites. Next, we turn to our outcome variables: we first describe the demand for local change in the pre-1789 *cahiers des doléances* and then we look at our measures of schooling and modernization in the post-1789 period. Finally, we describe our control variables.

### *Subscriber Density*

Following Squicciarini and Voigtländer (2015), we use the local density of subscribers to the 1777-79 *Encyclopédie* of Diderot and d'Alembert as our proxy for the presence of knowledge elites. Since larger cities tend to have more subscribers mechanically, we normalize subscriptions by

[8] For instance, within only 4 years, the number of schools increased by 50% , and doubled until 1850. Similarly, the number of communes without schools fell to 2,500 in 1850.

[9] For instance, Arnold (1961, p.48) talks about a national school inspector, arriving in a village and promising the construction of a school. The local mayor welcomed him with: *"You would have done a great deal better, Sir, if you had brought us money to mend our roads; as for schools, we don't want them."*

[10] The 1851 Falloux Law encouraged Catholic education also in public schools and, at the same time, it established clearer national standards and regulations.

[11] The Republicans passed several education laws, aimed at expanding and improving the quality of primary schooling while weakening the role of the Catholic Church. Among them, the 1881-1882 Ferry Laws, promoting free, secular, and mandatory education until age 13, represent the most important one.

[12] Table 5 lists all variables and sources.

population in 1750.[13] To reduce the influence of extreme values, we use log-subscriber density as our baseline variable: $lnSubDens = \ln(Subs/pop_{1750} + 1)$, where $pop_{1750}$ is city population in 1750.[14]

### *Cahiers des Doleances*

As mentioned earlier, the *cahiers* were a list of grievances and suggestions on several aspects of the social, economic, and political situation of the country. Hyslop (1934) grouped the *cahiers'* contents in 49 categories. *Cahiers* were submitted by each estate from each French *bailliage* (county). Altogether, Hyslop coded these for 332 *bailliages*.[15] For each of the 49 categories, she includes a dummy on whether the *cahier* of each of the three estates in a given *bailliage* discussed the respective category. For example, the third estate in 86% of all *bailliages* demanded equal tax liability, while only 4% asked for restrictions of the press.

Table 1: Demands for education and democratization by estate

| | (1) | (2) | (3) |
|---|---|---|---|
| | Clergy | Nobility | 3rd Estate |
| *Cahier topics on Education* | | | |
| E1. Proposing some measure of national education | 0.31 | 0.20 | 0.24 |
| E2. Etatisme in education | 0.21 | 0.25 | 0.43 |
| *Cahier topics on Democratization* | | | |
| D1. Approving vote by head | 0.17 | 0.06 | n.a. |
| D2. Demanding the same law for all classes | 0.11 | 0.09 | 0.39 |
| D3. Most strongly democratic | 0.02 | 0.01 | 0.29 |
| D4. Asking for publicity of governmental action | 0.23 | 0.49 | 0.57 |
| D5. Asking for freedom of the press | 0.15 | 0.74 | 0.85 |

*Note*: The table shows the proportion of bailliages (counties) in our data whose cahiers raised each respective topic. The underlying data are from Hyslop (1934).

Among the 49 categories coded by Hyslop (1934), we identify those that correspond to demand for a national education system and democratization (see Table 1). Regarding the former,

[13] Subscriptions per capita (among cities with above-zero entries) varied substantially, from 0.5 per 1,000 in Strasbourg to 16.3 in Valence; Paris belonged to the lower tercile of this distribution, with 0.85 subscriptions per 1,000.

[14] Adding a positive number ensures that the measure is also defined for cities with zero subscriptions, and more precisely, adding the number 1 yields $lnSubDens = 0$ in these cases. This reflects a normalization, so that in cities with $Subs = 0$, there is no relationship between subscriptions and growth.

[15] Using the *Atlas des Bailliages* (1905), we identify the exact *bailliage* where the 319 cities in Bairoch, Batou, and Chèvre (1988) database are located. When more than one city is located in the same *bailliage* we use the *bailliage*' s *cahiers* for all the cities located in that *bailliage*. With this methodology we obtain 169 1-to-1 matches and the remaining 150 cities are located in 52 *bailliages*. However, data on $lnSubDens$ are available only for 193 cities. Merging these with those cities that have data for the *cahiers* of the nobility and third estate, we end up with 149 observations.

we use "*cahiers* that propose some measure of national education" or ask for "etatisme (government involvement) in education." Regarding demand for democratization, the *cahiers* include the following categories: 1) "approving vote by head," 2) "most strongly democratic," 3) "demanding the same law for all classes," 4) "asking for publicity of governmental action," and 5) "asking for freedom of the press." Based on these variables shown in Table 1, we construct several proxies for demand for education and democratization. As a baseline, we use demands expressed by the nobility (2nd estate) and by the 3rd estate. We treat the demands by the clergy separately because this subset of the population was i) very small and ii) their views were largely conservative, representing those of the Catholic Church – for instance, the clergy was strongly against the renunciation of privileges, more than the nobility (Hyslop, 1934)) ). For example, while the clergy was in favor of expanding education, this referred mostly to *religious* education. This is apparent in Table 1, showing that only 21% of the clergy is in favor of government involvement in education. Similarly, only 11% of the clergy *cahiers* was demanding the same law for all classes and only 2% of them shows a strongly democratic attitude.

Regarding our proxies for demand for mass education, we use categories $E1$ and $E2$ from Table 1. These are expressed in terms of dummies in Hyslop's (1934) data, with the value one indicating that in the *cahier* from the *bailliage* around city $c$, estate $e$ expressed issues $E1$ or $E2$. Our main education variable includes both the nobility and the third estate, and it is computed as the first principal component of $\text{E1}_{ce}$ and $\text{E2}_{ce}$ with $e = \{\text{nobility, 3rd estate}\}$ across all cities $c$ in our sample. Similarly, our main democratization variable is computed as the first principal component using topics D1-D5 from Table 1 for nobility and 3rd estate. For robustness checks, we also compute the principal components only for nobility ($e =$ nobility) and only for the third estate ($e =$ 3rd estate) – and as a placebo for the clergy.

### *Schooling and modernization post-1789*

Our outcome variables in the post 1789 period are measured at the French departement level (after the Napoleonic period, there were 86 departements). First, we use several schooling outcomes in the post-revolutionary period. These include school rates in 1837 and 1876, literacy in 1876, the number of schools per 10,000 inhabitants in 1829, 1850 and 1876, and school growth in 1829-50 and in 1850-76. All these data are from the *Statistique Générale de la France*.

We use several proxies for modernization in the post-revolutionary period. First, we use information on mutual aid societies in 1878. These have their origins in the confraternities and trade guilds of the 18th early 19th century. They aimed at protecting their members when not able to work both because of unexpected risks or because of life-cycles (Baker, 2004).[16] Data on mutual

[16]Before 1848, all associations in France were considered illegal. Then, a few were tolerated. Among them, the

aid societies are from *Annuaire Statistique de la France*. To account for the possibility that the financial means (and need) for worker insurance were stronger in more developed regions, we normalize the number of mutual aid societies per capita by average disposable income in 1864 (from Delefortrie and Morice, 1959). As a second outcome variable that is related to modernization (and in particular, to state building), we look at the share of people and the share of children that spoke French in 1863. This information is from Weber (1976). Finally, we use data on the share of votes for progressive parties in 1876 from the *Annuaire Statistique de la France*.[17]

*Control variables*

Data on literacy in 1786 are from the *Statistique Générale de la France* and represent the percentage of men and women able to sign their wedding certificate. Other controls include department level urban population in 1750, dummies for cities with ports on the Atlantic Ocean, the Mediterranean Sea, and cities located on a navigable river (Dittmar, 2011), a dummy for cities that hosted a University before 1750 (Jedin, Latourette, and Martin, 1970; Darby and Fullard, 1970), a dummy for cities where a printing press was established before 1500 (Febvre and Martin, 1958; Clair, 1976), the (log) number of noble families per capita in each French department (Squicciarini and Voigtländer, 2015), and a dummy for Paris. Then, we include a measure of land inequality computed as the hectares of land owned by those having at least 40 hectares over the total hectares of land.

# 4 Empirical Results

In this section, we present our empirical results. First, we show that the presence of knowledge elites is positively associated with *demand* for expansion of mass education and democratization in the *Cahiers des Doléances*. Then, we show that the local density of knowledge elites in 1777-79 predicts the expansion of schooling and other proxies for modernization in the post-revolutionary period.

## 4.1 Knowledge Elites and Pre-Revolutionary Demands in the Cahiers de Doléance

In this subsection, we investigate the relationship between the presence of knowledge elites and demand for mass education and democratization at the eve of the French Revolution. We estimate equations of the form:

$$D_c = \beta \cdot S_c + \gamma \mathbf{X}_c + \varepsilon_c \,, \tag{1}$$

mutual aid societies were considered promoters of social order and even supported by the State. Only after the passage of the Law on Associations in 1901 could associations be freely created.

[17] We are grateful to Tommy E. Murphy for kindly sharing these data with us.

where $D_c$ denotes demands expressed in *cahiers* in city $c$, $S_c$ is the density of knowledge elites, $\mathbf{X_c}$ is a vector of control variables, and $\varepsilon_c$ is the error term. We use several categories for $D_c$, derived from the various topics discussed in the *cahiers* as described in Section 3.

Table 2 shows that the presence of knowledge elites is positively associated with the demand for national education in the *Cahiers des Doléances*. We first show this relationship when considering the *cahiers* of the nobility and third estate combined (cols 1-2). In column 1, we do not use any controls. Our main explanatory variable $lnSubDens$ alone explains 13% of the variation in demand for mass education across cities in France. To asses the magnitude of the relationship, we report the standardized beta coefficient at the bottom of Table 2. We find that a one-standard deviation increase in $lnSubDens$ is associated with 0.35 standard deviations increase in the demand for expansion of mass education among the nobles and the third estate. When adding our full set of controls in column 2, the coefficient of $lnSubDens$ becomes even stronger, and all variables together now explain 31% of the variation in demand for mass education. Table 2 also reports coefficients for our main control variables. Literacy in 1786 – as a measure for average human capital – is not significantly related to demand for mass education.[18] The same is true for our proxies for the presence of rich land-owning nobility: the number of noble families relative to population and land inequality, measured as the share of land owned by those with at least 40 hectares over the total hectares of land.[19]

The fact that we do not find a relationship between land inequality and demand for education deserves further discussion. The existing literature suggests that landowning elites, in order to protect their privileges, oppose the spreading of human capital promoting institutions, such as expansion of mass education (Sokoloff and Engerman, 2000; Easterly, 2007; Galor et al., 2009). However, historically, this mechanism was likely less important in the French context. First, redistribution during the French Revolution solidified small-scale landholding.[20] Second, French land owners had little influence on the rural community.[21] Finally, feudalism in French agriculture was abolished already in the late 18th century. Thus, the Prussian channel, where landownership in-

[18] Literacy and subscriber density are uncorrelated (see Squicciarini and Voigtländer, 2015). On average, fewer than 0.6 per 1,000 inhabitants were *Encyclopédie* subscribers (and 1.3 per 1,000 if we consider only cities with positive subscriptions) – too little to mechanically elevate literacy rates.

[19] Land inequality and noble density are correlated with a coefficient of 0.17. Including the two variables separately does not change our results, and each individual variable remains insignificant.

[20] Land redistribution during the French Revolution "reinforced the small-scale character of landholding in France and, by extension, the tenacious, ideologically informed sense of property ownership that would hinder attempts to achieve *remembrement* [land consolidation] in the nineteenth and early twentieth centuries" (**?**, p.113)

[21] As explained by Forster (1967, p.84-85) "Surely there was less contact between the rural community and the noble *rentier* or the noble owner...and less contact meant less local influence for the nobility." Moreover, he also argues that "the bonds of subordination ...throughout the entire society had been loosened [and].. by 1825 the erosion of the hierarchical society upon which hereditary aristocracy rested was far advanced."

equality had a negative effect on mass education because the serfdom system diminished private demand for education (Cinnirella and Hornung, 2016) is unlikely to be at play in France.

Table 2: Knowledge elites and demand for national education

Dep. Var.: Demand for national education system in the *Cahiers the Doléance*

| Estates included: | Nobles and 3rd Estate | | Nobles | 3rd Estate | Clergy | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *lnSubDens* | 0.606** | 0.685*** | 0.350* | 0.562*** | 0.133 | 0.199 |
| | (0.274) | (0.244) | (0.185) | (0.201) | (0.150) | (0.214) |
| Land Inequality | | -0.697 | -1.773 | 0.072 | | 1.413 |
| | | (1.432) | (1.267) | (1.169) | | (1.308) |
| *lnNoblesDens* | | 2.073 | 0.803 | 1.906* | | 1.128 |
| | | (1.939) | (1.566) | (1.092) | | (1.183) |
| Literacy 1786 | | -0.420 | 0.344 | -1.195* | | 2.197** |
| | | (0.781) | (0.695) | (0.623) | | (0.979) |
| Additional Controls | | ✓ | ✓ | ✓ | | ✓ |
| $R^2$ | 0.13 | 0.31 | 0.30 | 0.26 | 0.13 | 0.30 |
| Observations | 149 | 135 | 142 | 148 | 154 | 142 |
| Magnitude (beta coefficients) | | | | | | |
| beta coeff. $lnSubDensity$ | 0.350 | 0.395 | 0.235 | 0.392 | 0.092 | 0.136 |
| beta coeff. Literacy 1786 | | -0.057 | 0.055 | -0.199 | | 0.360 |

*Notes*: Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01. All regressions are run at the city level and are weighted by population in 1750. Columns 1 and 2 use two categories from *cahiers* related to the expansion of education: *cahiers* "proposing some measure of national education" and *cahiers* on "etatisme (government involvement) in education." The dependent variable is constructed as the principal component of these two categories for the nobility and the third estate, i.e., altogether four categories coded in the form of dummies by Hyslop (1934). Section 3 provides further detail on the construction of this variable. Column 3 uses the same *cahiers*, but only for the nobility, and column 4, only for the third estate. Columns 5 and 6 perform a placebo exercise and use the same *cahiers* for the clergy.

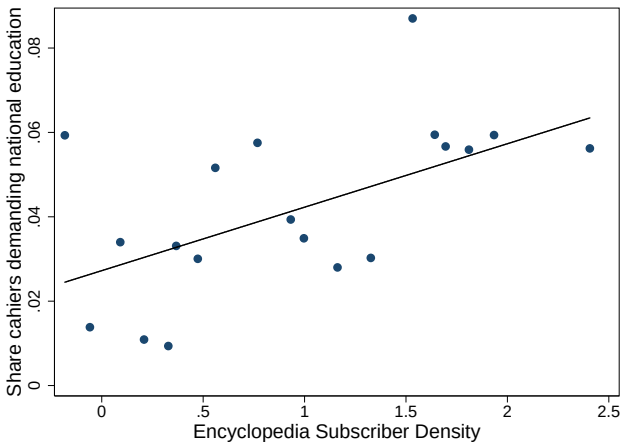
‡ Additional Controls include department level urban population in 1750, dummies for cities with ports on the Atlantic Ocean or located on a navigable river, a dummy for cities that hosted a University before 1750, a dummy for cities where a printing press was established before 1500, and a dummy for Paris.

Next, in columns 3 and 4 of Table 2, we examine *cahiers* from the second and third estates separately. We find statistically significant coefficients on $lnSubDens$ for both the nobility and the third estate, but results are somewhat stronger for the latter. This may be due to the fact that knowledge elites from the third estate (such as lawyers, doctors, and merchants) were in close contact with commoners and thus wanted to spread education to the lower social classes. Finally,

columns 5 and 6 use the *cahiers* of the clergy as a placebo and show that the coefficients are much smaller in magnitude and not significant. The clergy indeed represented a very small part of the population and had largely conservative views. Members of the clergy were strongly opposed to the renunciation of their privileges – even more than the nobility (Hyslop, 1934)).

Could our results merely be driven by knowledge elites making more demands in *any* category in the *cahiers*? To assess this possibility, we construct the demands for education relative to all other categories mentioned in each city's *cahiers*.[22] Table 3 replicates our analysis from Table 2, using this alternative dependent variable. We find statistically and quantitatively very similar results and confirm the stark difference between knowledge elites and average literacy – in fact, literacy has a negative coefficient in some specifications. Figure 1 shows that the positive relationship between knowledge elites and demand for education is not driven by outliers, using a binscatter plot that groups the x-axis into 20 equal-sized bins. The figure shows the partial correlation (after including all controls) corresponding to column 2 in Table 3

Figure 1: Binscatter: Knowledge Elites and Demand for Education in the Cahiers de Doléances




*Notes*: Binscatter plot, grouping the x-axis into 20 equal-sized bins. City/bailliage-level analysis. Corresponds to column 2 in Table 3. Controls include land inequality, the density of the nobility, literacy rate in 1786, department level urban population in 1750, dummies for cities with ports on the Atlantic Ocean or located on a navigable river, a dummy for cities that hosted a University before 1750, a dummy for cities where a printing press was established before 1500, the (log) number of noble families per capita in each French department, and a dummy for Paris.

[22] Using the notation from Section 3, the demand for education by the nobility and the third estate is thus given by adding, for each city $c$, the dummies $\text{E1}_{c,\text{nobility}}$, $\text{E1}_{c,\text{3rd estate}}$, $\text{E2}_{c,\text{nobility}}$, and $\text{E2}_{c,\text{3rd estate}}$, and dividing this by the sum of all *cahiers* dummies for city $c$ (i.e., across all topics) for nobility and third estate.

Table 3: Knowledge elites and demand for national education

Dependent Variable: Demand for national education system,
relative to all other demands in the *Cahiers the Doléance*

| Estates included | Nobles and 3rd Estate | | Nobles | 3rd Estate | Clergy | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *lnSubDens* | 0.011** | 0.015*** | 0.011 | 0.017** | 0.004 | 0.012 |
| | (0.005) | (0.005) | (0.008) | (0.007) | (0.007) | (0.012) |
| Land Inequality | | 0.011 | -0.042 | 0.035 | | 0.083 |
| | | (0.029) | (0.037) | (0.047) | | (0.053) |
| Literacy 1786 | | -0.017 | 0.012 | -0.049** | | 0.066* |
| | | (0.019) | (0.027) | (0.023) | | (0.038) |
| *lnNoblesDens* | | 0.037 | 0.025 | 0.041 | | 0.029 |
| | | (0.033) | (0.044) | (0.026) | | (0.040) |
| Controls | | ✓ | ✓ | ✓ | | ✓ |
| $R^2$ | 0.07 | 0.17 | 0.13 | 0.20 | 0.14 | 0.30 |
| Observations | 143 | 129 | 128 | 142 | 145 | 137 |
| Magnitude: subscriber density | | | | | | |
| beta coeff. $lnSubDensity$ | 0.262 | 0.412 | 0.231 | 0.370 | 0.053 | 0.174 |
| beta coeff. Literacy 1786 | | -0.108 | 0.062 | -0.251 | | 0.232 |

*Notes*: All regressions are run at the city level and are weighted by population in 1750. Columns 1 and 2 use *cahiers* "proposing some measure of national education" and *cahiers* on "etatisme (government involvment) in education" for the nobility and the third estate. Column 3 uses the same *cahiers*, but only for the nobility, and column 4 only for the third estate. Columns 5 and 6 perform a placebo exercise and use the same *cahiers* for the clergy. The dependent variable is the shares of the indicated categories over the overall topics covered in the *cahiers* of the *bailliage* (county) corresponding to a city, as coded by Hyslop (1934). Controls include all control variables (including additional ones) listed in Table 2. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Next, we turn to demand for democratization in the *cahiers*. Table 4 shows that the presence of knowledge elites is a significant predictor of democratic demands. This relationship is particularly strong in the *cahiers* of the nobility (col 3) and weaker for the third estate (col 4). The bottom of the Table reports the standardized beta coefficients, showing that a one standard deviation increase in $lnSubDens$ is associated with an increase by 0.3 standard deviations in the demand for democratization among the nobility, and by only 0.08 s.d. increase among the third estate. This difference between our results for nobility and third estate can be explained by the historical context. The nobility in France was – in contrast to other European countries – relatively little involved in the political process before the Revolution.[23] At the same time, for the enlightened subset of the nobility political participation was a key issue (Chaussinand-Nogaret, 1985). Consequently, seeking political participation was at least as important for the nobility as it was for the lower social ranks.[24] In addition, the progressive nobility was strongly in favor of merit-based, rather than hereditary, appointment to public offices: "Breaking here again with the dogma of prescriptive rights, privileges of birth and innate dignities, the nobility demanded that senior ranks should only in future be awarded for merit and that officers risen themselves from ranks (whose condescending title of 'officers of fortune' should be replaced by 'officers of merit') should be able to aspire to any rank and dignity" Chaussinand-Nogaret (1985, p.160).

In columns 5-6 we use the *cahiers* of the clergy as a placebo and find no relationship with the presence of knowledge elites. As discussed above, the clergy represented a very small subset of the population, and embraced the conservative view of the Catholic Church.

Finally, Table 5 looks at *cahiers* related to economic demands to check whether economic self-interest may be driving our results. The dependent variable is constructed as the principal component based on *cahiers* expressing demand for liberalism (cols 1-2) and *cahiers* expressing demand for mercantilism (cols 3-4), in both cases for the nobility and the third estate.[25] The coefficients on $lnSubDens$ are not significantly associated neither with demand for liberalism nor with demand for mercantilism. They are also quantitatively small, as indicated by the beta

[23] During late medieval and early modern times, the French king had a weaker standing relative to noble lords than the English monarch. However, after the religious wars that divided Europe in the 16th and 17th century, the power of the French monarchy increased continuously, until the king reached an absolutist status under Louis XIV (Roland, 2004).

[24] In the words of Chaussinand-Nogaret (1985, p.22): "It is impossible to discern two opposed social currents in Enlightenment thought, one bourgeois and the other noble. In cultural development and in the political and social thought of the Enlightenment, nobles played a role as important as the representatives of the third estate. In fact, they defined together a single and selfsame culture: one which culminated in the self-realization of a Nation individualistic, egalitarian, free to choose, and keen to take control of its destiny."

[25] More precisely, *cahiers* for liberalism include those proposing "the suppression of the guilds" and *cahiers* "showing only liberal economic demand." *Cahiers* demanding mercantilism include those proposing "the maintenance of the guilds" and *cahiers* "showing only mercantilist demand."

Table 4: Knowledge elites and demand for democratization

Dep. var.: Demand for democratic institutions in the Cahiers the Doléance

| Dependent var. | Nobles and 3rd Estate | | Nobles | 3rd Estate | Clergy | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *lnSubDens* | 0.392* | 0.384** | 0.460** | 0.145 | 0.054 | -0.062 |
| | (0.226) | (0.185) | (0.191) | (0.177) | (0.129) | (0.141) |
| Land Inequality | | -0.092 | 0.688 | -1.016 | | -0.996 |
| | | (1.426) | (1.261) | (1.150) | | (0.716) |
| *lnNoblesDens* | | 1.817 | 1.265 | 1.840 | | 1.455 |
| | | (1.839) | (1.520) | (1.118) | | (0.976) |
| Literacy 1786 | | 1.372 | 0.198 | 0.859 | | 0.256 |
| | | (0.866) | (0.792) | (0.548) | | (1.211) |
| Additional Controls | | ✓ | ✓ | ✓ | | ✓ |
| $R^2$ | 0.26 | 0.36 | 0.26 | 0.45 | 0.15 | 0.23 |
| Observations | 149 | 135 | 142 | 148 | 154 | 142 |
| Magnitude: subscriber density | | | | | | |
| beta coeff. $lnSubDensity$ | 0.189 | 0.212 | 0.303 | 0.083 | 0.021 | -0.041 |

*Notes*: Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01. All regressions are run at the city level and are weighted by population in 1750. Columns 1 and 2 use *cahiers* "approving vote by head", *cahiers* "that were most strongly democratic", *cahiers* "demanding the same law for all classes", *cahiers* "asking for publicity of governmental action", and *cahiers* "asking for freedom of the press". Column 3 uses the same *cahiers*, but only for the nobility, and column 4 only for the third estate. Columns 5 and 6 use the same *cahiers* for the clergy. The dependent variable is the principal component of the indicated categories, based on dummies for whether the *cahiers* of the *bailliage* (county) corresponding to a city raised the issue in question, as coded by Hyslop (1968). Additional controls are the same as those listed in the note to Table 2.

coefficients at the bottom of the table. This suggests that economic interests of knowledge elites – at least those related to the design of the economic system – are not a confounding factor in our analysis.

Table 5: Knowledge elites and economic demands

| Dependent var. | Demand for Liberalism | | Demand for Mercantilism | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *lnSubDens* | 0.074 | 0.076 | 0.039 | 0.144 |
| | (0.246) | (0.143) | (0.178) | (0.124) |
| Land Inequality | | -1.913 | | 0.992 |
| | | (1.298) | | (0.672) |
| *lnNoblesDens* | | 0.355 | | -0.707 |
| | | (0.700) | | (0.575) |
| Literacy 1786 | | -1.250* | | 1.934 |
| | | (0.703) | | (1.241) |
| Additional Controls | | ✓ | | ✓ |
| $R^2$ | 0.28 | 0.46 | 0.07 | 0.37 |
| Observations | 149 | 135 | 149 | 135 |
| Magnitude: subscriber density | | | | |
| beta coeff. $lnSubDensity$ | 0.041 | 0.048 | 0.036 | 0.133 |

*Notes*: Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01. All regressions are run at the city level and are weighted by population in 1750. Column 1 and 2 use *cahiers* proposing "the suppression of the guilds" and *cahiers* "showing only liberal economic demand" for the nobility and the third estate. Columns 3 and 4 use *cahiers* proposing "the maintenance of the guilds" and *cahiers* "showing only mercantilist demand" for the nobility and the third estate. The dependent variable is the principal component of the indicated categories, based on dummies for whether the *cahiers* of the *bailliage* (county) corresponding to a city raised the issue in question, as coded by Hyslop (1934). Additional controls are the same as those listed in the note to Table 2.

### 4.2 Knowledge Elites and Changes in Education after the French Revolution

In this subsection we turn to the post-revolutionary period and relate the presence of knowledge elites to the expansion of mass education. We estimate equations of the form:

$$y_c = \beta \cdot S_c + \gamma \mathbf{X}_c + \varepsilon_c \,, \tag{2}$$

where $S_c$ represents the density of knowledge elites in city $c$; $\mathbf{X_c}$ is a vector of control variables, and $\varepsilon_c$ is the error term. We use several outcome variables $y_c$ as proxies for schooling expansion.

The first two columns in Table 6 show that Encyclopedia subscriber density in 1777-79 is a strong predictor of school rates in 1837 and in 1876. Figure 2 shows the binscatter plot for the partial correlation corresponding to column 2 in Table 6. The figure illustrates that the strong relationship between subscriber density and schooling is not driven by outliers. Subscriber density also predicts *literacy* in 1876 (col 3). These results hold after controlling for initial literacy in 1786, and thus reflect the *growth* in mass education relative to the pre-revolutionary period. Next, columns 4-6 examine the supply of schooling before and after the July Monarchy, using the (log) number of schools per 10,000 inhabitants as dependent variable. We find that the relationship between subscriber density and schools per capita is particularly strong after the 1830s. Finally, columns 7 and 8 examine the growth in the number of schools over the periods 1829-1850 and 1850-1876. Importantly, the coefficient on $lnSubDens$ is positive and significant in column 7, while it becomes much smaller in magnitude and insignificant in column 8.

Table 6: Knowledge elites and schooling after the French Revolution

| Dependent var. | School Rate | | Literacy | Schools per 10,000 inhabitants | | | Schools Growth | |
|---|---|---|---|---|---|---|---|---|
| | 1837 | 1876 | 1876 | 1829 | 1850 | 1876 | 1829-50 | 1850-76 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *lnSubDens* | 0.039** | 0.045*** | 0.032** | 0.091 | 0.084** | 0.078*** | 0.057** | 0.017 |
| | (0.018) | (0.014) | (0.015) | (0.063) | (0.032) | (0.025) | (0.025) | (0.018) |
| Land Inequality | 0.043 | 0.036 | -0.097 | 0.316 | -0.141 | -0.050 | -0.184 | -0.027 |
| | (0.142) | (0.077) | (0.119) | (0.658) | (0.257) | (0.167) | (0.209) | (0.150) |
| *lnNoblesDens* | 0.671 | 0.205 | 1.026** | 4.486** | 0.433 | -0.291 | -1.124 | -0.660 |
| | (0.624) | (0.396) | (0.463) | (2.237) | (1.179) | (1.038) | (0.868) | (0.776) |
| Literacy 1786 | 0.885*** | 0.348*** | 0.577*** | 2.316*** | 1.085*** | 0.762*** | 0.329** | 0.071 |
| | (0.111) | (0.059) | (0.059) | (0.344) | (0.148) | (0.127) | (0.139) | (0.095) |
| Additional Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $R^2$ | 0.65 | 0.49 | 0.62 | 0.53 | 0.64 | 0.81 | 0.82 | 0.58 |
| Observations | 74 | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| Magnitude of subscriber density and initial literacy | | | | | | | | |
| beta coeff. $lnSubDensity$ | 0.140 | 0.295 | 0.155 | 0.108 | 0.161 | 0.138 | 0.094 | 0.074 |
| beta coeff. Literacy 1786 | 0.806 | 0.586 | 0.710 | 0.696 | 0.526 | 0.346 | 0.139 | 0.078 |

*Notes*: All regressions are run at the department level and are weighted by population in 1831. Additional controls include department level population in 1831, and a dummy for Paris. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

The findings in Table 6 are in line with the hypothesis that knowledge elites played an important role in the expansion of mass education during the July Monarchy, i.e., the period when local elites had ample opportunities to foster the implementation of nation-wide educational reforms

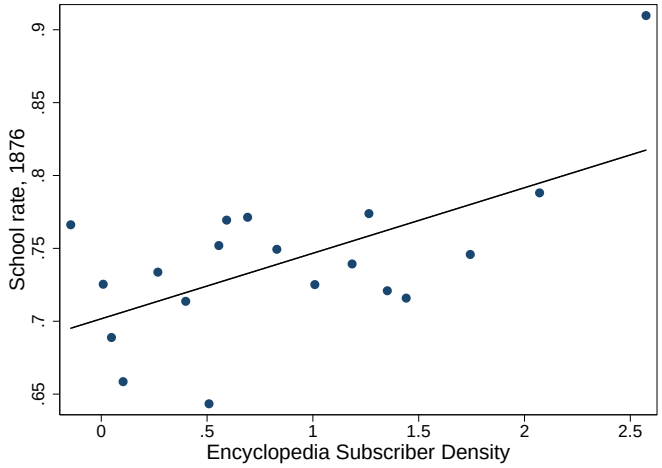
(see the discussion in Section 2). These results are corroborated by department-level data on school investment from the *Statistique Générale de la France*. More precisely, the data cover total expenses for public primary schooling from private, commune-, department-, and State-level funds. The commune-level expenditures accounted for the majority of the total expenditures – in 1855 they were about 75% of the total. Figure 3 shows the coefficients of regressing school expenditures (from all categories) in 10-year intervals between 1830 and 1870 on *Encyclopédie* subscriber density. We find statistically significant coefficients in each decade before 1870, and the relationship is particularly strong in the 1840s. This – together with the fact that most school expenditures originated at the community level – suggests a strong involvement of local knowledge elites in financing public education during the July Monarchy.

Could our findings on school expenditures merely be driven by knowledge elites being richer, and thus having more access to funding? Two additional checks in our data make this unlikely. First, the regressions that underly Figure 3 control for the presence of nobility and land inequality; both variables have small and insignificant coefficients. Thus, having a rich upper class alone is not associated with investment in schooling. Second, for a later point in time – the year 1876 – data are available by source of school funding, so that we can run the regressions underlying Figure 3 separately for each category. For town-level expenditures, we find a strong positive and significant coefficient of 0.59 on subscriber density. In contrast, for private funding of schooling, the coefficient is much smaller (0.03) and insignificant. This suggests that knowledge elites were not merely families with deep pockets that donated money for schools. In sum, our empirical results are in line with the historical evidence presented in Section 2.3, supporting the interpretation that knowledge elites where involved in the local organization and implementation of schooling policies.

### 4.3 Other Proxies for Modernization after the French Revolution

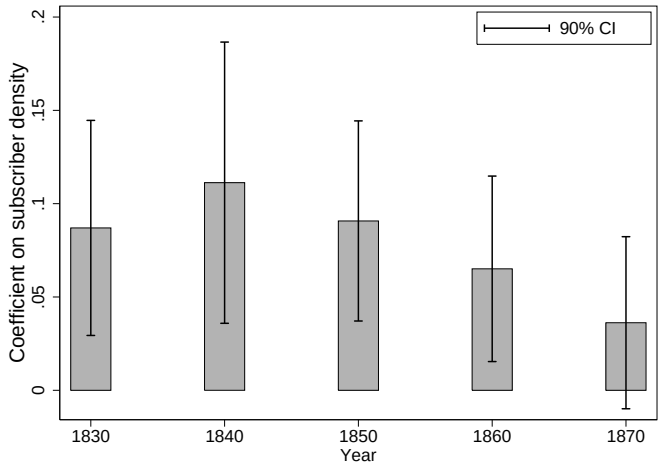
We now turn to the relationship between knowledge elites and alternative proxies for modernization in the second half of the nineteenth century. First, we use data on members and number of mutual aid societies in each department. Mutual aid societies were an important source of insurance for their members, and they were considered promoters of social order by the state. In general, civic associations are often viewed as "schools in democracy" because they transmit skills and competencies that are important for democratic participation, and because they foster the political debate (Wollebaek and Selle, 2002). According to Putnam (1993, pp. 89-90), "[a]ssociations instill in their members habits of cooperation, solidarity and public-spiritedness." Columns 1-4 in Table 7 present our results for mutual aid societies. Since financial means (and need) for worker insurance was likely stronger in more developed departments, we divide the *members* in mutual aid

Figure 2: Pre-Revolution Knowledge Elites and Schooling in 1876




*Note*: Binscatter plot, grouping the x-axis into 20 equal-sized bins. Department-level analysis. The figure plots the partial correlation between $lnSubDensity$ and the school rate in 1876, corresponding to the specification in column 2 of Table 6 (see the table for the controls that are included).

Figure 3: Knowledge Elites and Primary School Expenditure, 1830s – 1870s




*Notes*: The y-axis shows the coefficient on Encyclopédie subscriber density in a regression where the dependent variable is departement-level expenditure for primary schools from the *Statistique Générale de la France*. Control variables are literacy in 1786-90, the density of noble families in 1790, land inequality, log population in the respective decade, and a dummy for Paris.

societies (cols 1-2) and the *number* of mutual aid societies (cols 3-4) by total disposable income in the department in 1864. To further allow for non-linear relationships with economic development, columns 2 and 4 flexibly control for the 5th order polynomials in p.c. income and urbanization rates.[26] In all specifications, the coefficient on $lnSubDens$ is positive and significant. In terms of magnitude (beta coefficient), a one-standard deviation increase in subscriber density is associated with a rise in the presence of mutual aid societies by 0.25 standard deviations. These results imply that the historical presence of knowledge elites is associated with the formation of social capital after the French Revolution. Below, we provide evidence that this relationship worked via knowledge elites fostering mass education, which is in line with the argument by Lipset (1960) that education is a cornerstone of modernization.

Table 7: Knowledge elites and modernization post-1789

| Dependent var. | Mutual aid societies 1878 | | | | French speaking 1863 | | Share rep. |
|---|---|---|---|---|---|---|---|
| | Members per disp. income | | Nr. of societies per disp. income | | Share population | Share children | votes 1876 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| *lnSubDens* | 0.226** | 0.215** | 0.263** | 0.258** | 0.078* | 0.032** | 0.051** |
| | (0.093) | (0.082) | (0.115) | (0.112) | (0.040) | (0.016) | (0.021) |
| Literacy 1786 | -0.409 | -0.678 | -0.998** | -1.348** | 0.694*** | 0.339*** | 0.148 |
| | (0.380) | (0.440) | (0.454) | (0.556) | (0.135) | (0.059) | (0.126) |
| Non-French Dept | | | | | -0.322** | -0.235*** | |
| | | | | | (0.143) | (0.057) | |
| Additional Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5th order polyn. in income pc and urb. rate | | ✓ | | ✓ | | | |
| $R^2$ | 0.25 | 0.43 | 0.19 | 0.37 | 0.33 | 0.45 | 0.27 |
| Observations | 73 | 73 | 73 | 73 | 74 | 74 | 74 |
| Magnitude of subscriber density and initial literacy | | | | | | | |
| beta coeff. $lnSubDensity$ | 0.265 | 0.253 | 0.254 | 0.248 | 0.182 | 0.171 | 0.254 |
| beta coeff. Literacy 1786 | -0.123 | -0.204 | -0.247 | -0.332 | 0.415 | 0.461 | 0.191 |

*Notes*: Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. All regressions are run at the department level and are weighted by population in 1871. Additional controls include literacy in 1786-90, the density of noble families in 1790, land inequality, log population in the respective decade, and a dummy for Paris. Col. 7 controls also for election turnout in 1876.

In columns 5 and 6 of Table 7, we use as dependent variables the share of French speaking population and the share of French speaking children, respectively. These variables represent a proxy for state building (Alesina and Reich, 2015). In both cases we include a dummy for

[26] As is well-documented, urbanization rates and per-capita income in Europe before 1900 can be used interchangeably as proxies for economic development (DeLong and Shleifer, 1993; Acemoglu, Johnson, and Robinson, 2005; Dittmar, 2011). Including the 5th order polynomials in these variables separately does not change our results.

historically non-French speaking departments to capture local variation in language from before the French Revolution. The coefficients on $lnSubDens$ are positive and significant, suggesting that the presence of knowledge elites is associated with a higher local integration in the national culture, as reflected by a higher familiarity with the French language. The size of the coefficient in column 5 implies that a one-standard deviation increase in subscriber density is associated with a 6 percentage point higher share of French speaking people in 1863, relative to a mean of 79 percent of French speakers. The beta coefficients for $lnSubDens$ in columns 5 and 6 are above 0.4, implying that a substantial part of the variation in French speaking children and population is associated with the variation in the historical presence of knowledge elites.

Finally, column 7 in Table 7 uses the share of votes for Republican parties in 1876 as outcome variable, controlling also for election turnout. The Republican parties included the *Modérés et Libéraux*, the *Radicaux socialistes*, the *Radicaux*, the *Socialistes*, and the *Ralliés*. These parties supported the ideals of the French Revolution, and they were opposed to the reactionary coalition, which included the *Monarchistes* and the *Revisionistes* (Avenel, 1894). Consequently, the share of progressive votes indicates the extent to which the spirit of modernization was anchored in the population.[27] We find a strong positive correlation between the presence of knowledge elites and progressive voting. A one-standard deviation higher share of *Encyclopédie* subscribers in the 18th century is associated with 4 percentage points higher votes for progressive parties, relative to an average vote share of 55 percent in 1876.

Next, we combine the different modernization proxies into a single index. Table 8 uses as dependent variable the first principal component of members of mutual aid societies (relative to disposable income in 1878), the share of French speaking children in 1863, and the share of Republican votes in 1876. We find a strong positive coefficient for our main explanatory variable, $lnSubDens$, using different sets of control variables (cols 1 and 2). The coefficient on historical literacy is positive and marginally significant, suggesting that initial education of the population favored modernization (Lipset, 1960). Interestingly, the coefficient on $lnSubDens$ becomes smaller in magnitude and loses its statistical significance when we control for school rates in 1876 (col 3). Recall that an important part of the variation in school rates in 1876, in turn, is explained by historical subscriber density (Table 6, col 2). These two results in combination thus suggests that the density of knowledge elites fostered modernization at the local level by promoting the expansion of mass education.[28]

[27] In 1848, the suffrage was extended to all resident male citizens in France. Thus, the results from the 1876 election reflect the political preference of the (male) population overall, rather than just a small subset with voting rights.

[28] In an exploratory 2-stage-least-square analysis, we use the variation in school rates that is predicted by knowledge elites (controlling for all variables used in Table 8, including initial literacy). The first stage is strong, with an F-statistic of 20.8. The second stage regresses the modernization index on predicted school rates in 1876, documenting a

Table 8: Knowledge elites and modernization (index) post-1789

| Dependent var.: Modernization index | | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *lnSubDens* | 0.356*** | 0.285** | 0.147 |
| | (0.133) | (0.119) | (0.139) |
| Land Inequality | 0.161 | 0.412 | 1.199 |
| | (1.071) | (1.063) | (1.086) |
| *lnNoblesDens* | -0.619 | -0.076 | -3.266 |
| | (5.090) | (4.407) | (5.178) |
| Literacy 1786 | 1.202* | 1.175* | |
| | (0.635) | (0.601) | |
| School Rate 1876 | | | 2.774** |
| | | | (1.190) |
| Additional Controls | ✓ | ✓ | ✓ |
| Income pc and urb. rate | ✓ | ✓ | ✓ |
| 5th order polyn. in income pc and urb. rate | | ✓ | ✓ |
| $R^2$ | 0.43 | 0.57 | 0.55 |
| Observations | 74 | 74 | 77 |

*Notes*: Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. All regressions are run at the department level and are weighted by population in 1876. Additional control include literacy in 1786-90, log population in the respective decade, and a dummy for Paris.

### 4.4 Confounding Factors

In this section, we check whether our results may be driven by the demand for skilled labor in more industrialized areas. In particular, Squicciarini and Voigtländer (2015) have shown that knowledge elites are strongly associated with industrialization in France. If industrialization needed qualified workers, then the relationship between knowledge elites and schooling may reflect underlying (and unobserved) skill demand. However, the timeline of our results makes this unlikely: Skills of the workforce overall became important only during the Second Industrial Revolution (Galor and Moav, 2006). This stage of industrialization began in France after 1870, and thus after most of our outcomes are measured (Mokyr, 1999). Nevertheless, one may argue that demand for worker skills increased gradually in the period leading up to the Second Industrial Revolution. To address this possibility, we provide indirect evidence for an earlier period. Table 9 uses district level wages in 1839-47 as a proxy for productivity.[29] The presence of knowledge elites before 1780 is a strong predictor of wages about 60 years later (col 1). In addition, the school rate in 1837 is also strongly positively related with wages. This latter relationship suggests that there was a school premium – areas with more education saw higher wages on average. Note, however, that for the skill premium to confound our results in the way discussed above, it would have to be *stronger* in more industrial areas, which in turn are areas with thicker knowledge elites. In other words, for skill demand to confound our results, the skill premium would need to be higher in areas with thicker knowledge elites. We check this in column 2, by including an interaction term between the school rate and $lnSubDens$. We find a small, negative, and insignificant coefficient. Thus, if anything, the skill premium was *lower* in areas with thicker knowledge elites. This holds also when we include additional controls in column 3. This finding is compatible with the fact that early industrialization was mostly skill-replacing. Thus, knowledge elites (who fostered early industrialization in France) likely adopted technology that had relatively higher demand for unskilled labor, thus reducing the skill premium.

In columns 4 and 5, we provide further evidence along these lines by splitting the sample into modern and old sectors.[30] We find that the direct relationship between knowledge elites and wages was much stronger in modern sectors (i.e., those that saw rapid innovation during the First Industrial Revolution). In addition, the interaction term between schooling and $lnSubDens$ is signifi-

strong, positive, and significant relationship. We refer to this analysis as 'exploratory' because the exclusion restriction is unlikely to hold: we do not claim that knowledge elites affected modernization only through schooling. Instead, schooling is one likely mechanism behind the elite-modernization relationship.

[29] We derive wage data by industry sector and arrondissement from the firm-level data by Chanut, Heffer, Mairesse, and Postel-Vinay (2000).

[30] The definition of 'modern' and 'old' sectors follows from the data on 'inventive output' in Nuvolari and Tartari (2011). See Squicciarini and Voigtländer (2015, Section V.C.) for a detailed description.

cantly negative in modern sectors. This supports the interpretation that knowledge elites fostered the adoption of modern, skill replacing technology before 1850. In turn, our findings make it unlikely that the presence of knowledge elites had an indirect effect on schooling by raising the skill premium and thereby incentivizing workers to obtain education, or by incentivizing industrialists to augment the supply of schooling.

Table 9: Knowledge elites and skill demand

Dependent variable: log wages (by sector and arrondissement) in 1837-40

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | | | modern | old |
| *lnSubDens* | 0.057*** | 0.092*** | 0.085*** | 0.051** | 0.147*** | 0.048 |
| | (0.011) | (0.025) | (0.026) | (0.025) | (0.035) | (0.029) |
| School Rate 1837 | 0.213*** | 0.241*** | 0.267*** | | 0.320*** | 0.278*** |
| | (0.062) | (0.066) | (0.068) | | (0.085) | (0.082) |
| lnSubDens x School Rate | | -0.075 | -0.083 | -0.043 | -0.159** | -0.051 |
| | | (0.056) | (0.053) | (0.058) | (0.067) | (0.060) |
| Establishment size | 0.021*** | 0.020*** | 0.020*** | 0.022*** | -0.019* | 0.051*** |
| | (0.006) | (0.006) | (0.007) | (0.008) | (0.010) | (0.009) |
| Urbanization Rate | 0.673*** | 0.671*** | 0.753*** | | 0.791*** | 0.777*** |
| | (0.077) | (0.078) | (0.077) | | (0.098) | (0.073) |
| Controls | | | ✓ | ✓ | ✓ | ✓ |
| Department FE | | | | ✓ | | |
| $R^2$ | 0.18 | 0.18 | 0.23 | 0.36 | 0.26 | 0.27 |
| Observations | 1429 | 1429 | 968 | 968 | 429 | 539 |

*Notes*: All regressions are run at the arrondissement level. Additional controls include department level population in 1831, dummies for arrondissements with ports on the Atlantic Ocean or located on a navigable river, a dummy for arrondissements that hosted a University before 1750, a dummy for cities where a printing press was established before 1500, and a dummy for Paris. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

## 5 Conclusions

A large literature has debated the factors that drive modernization – the process of economic development that goes hand-in-hand with democratization and the expansion of education. Previous explanations have typically assumed a latent demand in the population for democratization and education. We began by documenting the demand for modernization at the eve of the French Revolution, using letters of grievances (*Cahiers de Doléances*) addressed to King Louis XVI. We

found that this demand was astonishingly small among the lower social classes. At the same time, however, there was a strong relationship between the local presence of knowledge elites (proxied by subscriptions to the famous *Encyclopédie* in 1777-80) and demand for modernization. We then turned to the post-Revolution period and documented a strong correlation between knowledge elites and the expansion of education after 1830 – the period during which the central government pursued major schooling reforms. We also showed that the presence of knowledge elites was strongly associated with other indicators of modernization and state-building in the mid-19th century: the share of French-speaking school children, association density, and votes for progressive political parties. These findings support the hypothesis that knowledge elites played an important role in the modernization of France. They fostered the implementation of education policies at the local level. Education, in turn, provided the basis for other dimensions of modernization, such as state building, progressive political views, and social capital. In sum, our findings suggest that enlightened elites had a latent demand for modernization already before the French Revolution, and that they fostered modernization once the political environment after the Revolution allowed for their active involvement. Thus, our results point to an interesting interaction between the *local* demand for societal change and *aggregate* institutions that seek to promote modernization.

In the context of the literature that has studied the relationship between inequality and development, our findings suggest a novel angle. Sokoloff and Engerman (2000) have argued that inequality can hamper development by favoring the development of institutions that entrench elites and restrict economic opportunities for the masses. Our findings, in contrast, suggests that the *type* of elites is crucial for whether they hamper or foster economic development. In particular, we find that enlightened elites are positively associated with the expansion of education to the masses and other proxies for modernization. Our findings also relate to the role of institutions that are put in place by elites (Acemoglu and Robinson, 2012). Our findings suggest that enlightened elites are more likely to foster the development of inclusive (as opposed to extractive) institution. This opens the door for future research to examine the relationship between the type of elites in power and economic development more systematically and across countries.

Table 10: Overview of the variables used in the paper

| Variable Name | Variable Description | Source |
|---|---|---|
| | *Main outcome variables* | |
| Demand for national education in the *Cahiers* | PCA (or share) of "education" contents in the *Cahiers de doleances* | Hyslop (1934) |
| Demand for democratization in the *Cahiers* | PCA of "democratization" contents in the *Cahiers de doleances* | Hyslop (1934) |
| Economic demands in the *Cahiers* | PCA of liberalist or mercantilist contents in the *Cahiers de doleances* | Hyslop (1934) |
| School rate 1837, 1876 | Students over school-aged children | Statistique Générale de la France |
| Literacy 1876 | percentage of people able to sign their wedding certificate | Statistique Générale de la France |
| Schools per 10,000 inhabitants 1829, 1850, 1876 | number of schools per 10,000 inhabitants | Statistique Générale de la France |
| School Growth, 1829-50 | (log) number schools in 1850 over number of schools in 1829 | Statistique Générale de la France |
| School Growth, 1850-76 | (log) number schools in 1876 over number of schools in 1850 | Statistique Générale de la France |
| Mutual aid societies (members)1878 | Members of mutual aid societies per disposable income | Annuaire Statistique de la France |
| Mutual aid societies (number)1878 | Number of mutual aid societies per disposable income | Annuaire Statistique de la France |
| French speaking population 1863 | Share of the population "using" French as language | Weber (1976) |
| French speaking children 1863 | Share of children not writing and not speaking in French | Weber (1976) |
| Share rep. votes 1876 | Share of votes to the Republican coalition | Avenel (1894) |
| Wages 1839-1847 | (log) wages by sector and arrondissement 1839-47 | Chanut et al. (2000) |
| | *Controls* | |
| Atlantic Port | dummy equal to 1 for cities located on the Atlantic Ocean | Dittmar (2011) |
| Navigable River | dummy equal to 1 for cities located on a navigable river | Dittmar (2011) |
| Universities | dummy equal to 1 for cities hosting a university before 1750 | Jedin et al. (1970); Darby and Fullard (1970) |
| Printing press in 1500 | dummy equal to 1 for cities where a printing press was established before 1500, | Febvre and Martin (1958); Clair (1976) |
| Paris | dummy equal to 1 for Paris (Seine department) | |
| Literacy 1786 | percentage of people able to sign their wedding certificate | Statistique Générale de la France |
| School Rate (several years) | ratio of students to school-age population | Statistique Générale de la France |
| Department urban population 1750 | department level urban population in 1750 | Bairoch et al. (1988) |
| Department population (different years) | log total department population | Statistique Générale de la France |
| | *Additional Controls* | |
| Non-French speaking departments | dummy equal to 1 for departments located in non-French speaking areas | http://www.lexilogos.com/france_carte_dialectes.htm |
| Log Income 1864 | log disposable income in 1864 | Delefortrie and Morice (1959) |
| Share of urban population | urban population divided by total population | Statistique Générale de la France |
| Establishment size | (log) number of workers per establishment in 1839-1847 | Chanut et al. (2000) |

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