Online Appendix

Devotion and Development:
Religiosity, Education, and Economic Progress in 19th Century France

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A Additional specifications

In this section, I run a series of robustness checks.

A.1 Religiosity and industrialization: Robustness checks

Table A.1: Negative relationship between religiosity and industrialization during the 2nd Industrial Revolution – including additional controls

Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
							weighted by pop.	
Share Refract. Clergy	-0.169**	-1.162***	-0.139**	-0.994***	-0.126**	-0.934***	-0.123**	-0.988***
	(0.073)	(0.307)	(0.057)	(0.261)	(0.059)	(0.252)	(0.055)	(0.312)
Pre-Industrial Activities	0.072***	0.184	0.064***	0.125	0.059***	0.102	0.063***	0.098
	(0.022)	(0.123)	(0.019)	(0.108)	(0.018)	(0.103)	(0.015)	(0.110)
Huguenots pc 1861	0.045	0.197*	0.048*	0.220*	0.031	0.148	0.024	0.156
	(0.028)	(0.114)	(0.025)	(0.122)	(0.024)	(0.116)	(0.023)	(0.111)
Secondary Educ. pc 1876	0.348	-0.112	-0.154	-1.181	-0.230	-1.525	-0.331*	-1.856
	(0.234)	(1.177)	(0.188)	(1.257)	(0.195)	(1.208)	(0.197)	(1.216)
Share Mod. Second. Educ	0.219	1.725*	0.333	1.891**	0.248	1.524*	0.234	1.472
	(0.205)	(0.869)	(0.201)	(0.791)	(0.196)	(0.790)	(0.185)	(0.922)
Farm size 1862			0.093***	0.672***	0.095***	0.679***	0.094***	0.785***
			(0.029)	(0.156)	(0.028)	(0.159)	(0.028)	(0.171)
Value Agric. Prod. pc 1892			-0.189***	-0.486***	-0.186***	-0.464***	-0.195***	-0.581***
			(0.039)	(0.160)	(0.037)	(0.155)	(0.032)	(0.171)
Railways Density 1879					0.094**	0.404*	0.111***	0.557**
					(0.038)	(0.223)	(0.034)	(0.251)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.64	0.60	0.74	0.68	0.76	0.70	0.88	0.73
Observations	78	78	78	78	78	78	78	78

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

First, Table A.1 adds the additional controls (listed in col. 2 of Table 1) measured at the eve of or during the Second Industrial Revolution. The share of Huguenots and the share of students in modern secondary schools are positively associated with the industrialization measures (cols. 1-2).[1] While Table 4 already takes into account the role of geographic factors for involvement in agricultural vs. industrial activities, I now control for the state of agriculture in the 19th century. Specifically, the coefficient on average farm size is positive and significant. At the same time, there is a negative and significant relationship between value of agricultural production per capita and my outcome variables, suggesting that industrialization was lower in departments with higher income from agriculture. Next,

[1]Data on the Huguenot population in 1861 are not available for the Haute-Saone department. This further reduces the number of observations from 79 to 78.

columns 5-6 add, as a further control, the density of the railway system in 1879; this is positively and significantly associated with the industrialization measures. Columns 7-8 weight regressions by population. The results on religiosity hold in all specifications.

Religiosity and conservatism

I consider the antiscientific approach of the Catholic Church as a measure of resistance to adoption of technical and scientific knowledge. One key concern could be that this antiscientific attitude is capturing a broader conservative *état d'esprit*. Controlling for the presence of knowledge elites partly addresses this issue. However, knowledge elites represented an enlightened intellectual minority, and their presence does not necessarily reflect the *état d'esprit* of the rest of the population. I now use data from the *cahiers de doléances* and identify seven categories reflecting "conservative" contents: (1) "*cahiers* appealing to French tradition;" (2) "*cahiers* making reservation on the renunciation of privileges;" (3) "*cahiers* concerned for a regeneration of the *moeurs*;" (4) "*cahiers* asking for restriction of the press;" (5) "*cahiers* in favor of maintaining the gilds;"6) "*cahiers* in favor of maintaining feudal justice gilds;" and (7) "*cahiers* showing conservative nationalism." I construct the share of "conservative" categories in the *cahiers* of the third estate and use it as a proxy for a general dimension of conservatism at the local level.[2]

Table A.2: Religiosity positively associated to conservatism

Dependent Variable: Share Antireligious *Cahiers*

	(1)	(2)
Share Conserv. *Cahiers*	-0.247	-0.416**
	(0.179)	(0.186)
Controls		✓
R^2	0.06	0.18
Observations	75	70

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1 (except for the use of literacy in 1786-90, rather than enrollment rate in the 19th century). Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.2 shows a negative relationship between the share of antireligious contents and the share of conservative contents in the *cahiers* of the third estate,[3] suggesting, as one would expect, that religiosity was related to a broader conservative attitude.

[2] This is computed analogously to the share of antireligious contents (see section 4.1). I do not include the share of conservative contents in the *cahiers* as a baseline controls, since it would systematically reduce the number of observations.

[3] All regressions control for the (log) number of topics covered in each *cahier*. Not including this variable provides extremely similar results.

Since (as discussed in Section 2) the struggle between religion and science sometimes took on political connotations, I now use election outcomes in different moments of French history to empirically analyze the relationship between religiosity and political behavior. First, I look at the 1849 legislative elections for the Parliament and use an index (ranging from 1 to 11) that represents the votes to the Democratic Socialist party (Bouillon, 1956).[4] Then, I use the share of the votes to the Republican parties in 1876, i.e., during the period of the Third Republic (Avenel, 1894).[5] Finally, I construct the principal component of both outcomes, "PCA Progressive Voting." Table A.3 shows the results. In all cases, a negative relationship between religiosity and the share of votes for progressive parties exists (cols.1-6). To further rule out that these findings are driven by the fact that the share of refractory clergy captures political attitudes toward the French Revolution, cols. 7-8 use the share of antireligious *cahiers* as an indicator of religiosity. The results hold.

Table A.3: Religiosity negatively associated to progressive voting

Dependent Variable: Votes to Progressive Parties

	1849 (Index)		1876 (Share)		PCA Progressive Voting			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share Refract. Clergy	-3.738**	-6.201***	-0.251***	-0.261***	-2.120***	-2.607***		
	(1.601)	(1.899)	(0.071)	(0.082)	(0.529)	(0.643)		
Share Anti-Relig. *Cahiers*							5.036**	5.685**
							(2.501)	(2.214)
Controls		✓		✓		✓		✓
R^2	0.07	0.30	0.15	0.45	0.18	0.39	0.06	0.28
Observations	80	78	83	79	80	78	72	71

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Col. 4 includes the 1876 electoral turnout. Cols. 7-8 control for the (log) number of topics covered in the *cahiers*. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Finally, in Table A.4, I regress my economic and industrial outcomes on both religiosity and conservatism.[6] In all specifications, the coefficient on religiosity is still negative and significant, while conservatism is not significantly associated with economic development. This suggests that the anti-scientific dimension of Catholicism (rather than a conservative attitude as such) is likely to explain the negative relationship between religiosity and economic development after 1870.

[4]The suffrage was attained in 1848 and extended to all resident male citizens. In 1849, the Democratic Socialist party lost the elections with about 30% of the votes. The *Parti de l'Ordre* obtained instead the majority of the votes (about 50%).

[5]The Republican parties included the *Modérés et Libéraux*, the *Radicaux socialistes*, the *Radicaux*, the *Socialistes*, and the *Ralliés*. This was opposed to the reactionary coalition which included the *Monarchistes* and the *Revisionistes*.

[6]I use pre-1870 measures of conservatism, to rule out that these are affected by economic development during the Second Industrial Revolution.

Table A.4: Negative relationship between religiosity and industrialization – controlling for conservatism

Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
			weighted by pop.				weighted by pop.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share Refract. Clergy	-0.176*	-1.403***	-0.245***	-1.869***	-0.158*	-1.292***	-0.215**	-1.540***
	(0.088)	(0.336)	(0.088)	(0.362)	(0.087)	(0.291)	(0.092)	(0.379)
Share Conserv. *Cahiers*	0.017	-0.819	-0.110	-0.738				
	(0.484)	(1.876)	(0.449)	(2.064)				
Progressive Voting 1849					-0.001	-0.027	-0.002	-0.022
					(0.005)	(0.020)	(0.006)	(0.025)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.60	0.60	0.80	0.65	0.59	0.56	0.79	0.57
Observations	72	72	72	72	78	78	78	78
standardized beta coefficients								
Share Refractory Clergy	-0.227	-0.381	-0.259	-0.509	-0.210	-0.371	-0.230	-0.436
Share Conserv. Cahiers/ Prog. Voting	0.004	-0.004	-0.019	-0.032	-0.020	-0.112	-0.028	-0.084

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Cols. 1-4 also include the (log) number of topics covered in the *cahiers*. Robust standard errors in parentheses. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Additional robustness checks: cross-sectional analysis at the department level

Here, I show that the cross-sectional results hold when performing a variety of robustness checks.

As discussed in the text, remoteness and distance (also in terms of linguistic and cultural background) could represent an important confounder. However, when carefully looking at Figure 2, the concern that geographic core-periphery patterns are driving the results is mitigated: for instance, the Northern and Eastern departments of the country are relatively close to Paris and more religious than the more distant (and less religious) Limousin or Alps departments. Similarly, the core-periphery dichotomy does not seem to hold in terms of cultural openness vs. backwardness either. For instance, much of the Loire Valley, from Nantes to Southern Brittany is easily accessible, fairly rich and culturally connected, but, at the same time, more religious than the more distant (and less accessible) areas of the Alps or of parts of the Massif Central. Empirically, I already account for difference in the reach of central institutions by controlling for distance from Paris and for whether a department was located in *Pays d'elections*. Here, I specifically focus on Brittany and on those departments that had traditionally spoken a language other than French. Table A.5 shows the results. Columns 1-4 exclude the region of Brittany (i.e., the departments of Finistere, Ille-et-Vilaine, Cotes d'Armor, and Morbihan), and columns 5-8 exclude the non-French speaking departments (i.e., those areas speaking Alsacien, Basque, Breton, Catalan, and Corsican).[7] Excluding these areas from the analysis provides

[7]Using linguistic data from http://www.lexilogos.com/france_carte_dialectes.htm, I construct a dummy for non-French speaking departments. There are three main groups of romance languages in France: *langue d'oc*, *langue d'oil* (the official French), and *langue francoprovencal*. I consider all three "French." By this definition, the following dialects are "non-

very similar results to those in the baseline specification.

In addition, France can be divided into five broad regions, based on different climatic and cultural characteristics.[8] To check whether the department-level findings are driven by regional differences, Table A.6 controls for region fixed effects. Table A.7 uses Conley standard errors to account for spatial autocorrelation (Conley, 1999). These are computed using the geographic location of the main city of each department and assuming a cut-off window of 100 kms.[9] Finally, another concern could be that the results are driven by Paris (Seine department) – especially if it had low religiosity, but was highly industrialized. Table A.8 excludes the Seine department from the analysis. The findings on religiosity hold in all specifications.

Table A.5: Negative relationship between religiosity and industrialization – excluding Brittany and non-French speaking departments

	Excl. Brittany				Excl. Non-French Speaking			
Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
			weighted by pop.				weighted by pop.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share Refract. Clergy	-0.134*	-1.043***	-0.190**	-1.310***	-0.152**	-1.093***	-0.211***	-1.419***
	(0.072)	(0.295)	(0.078)	(0.392)	(0.075)	(0.314)	(0.079)	(0.409)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.59	0.56	0.78	0.57	0.59	0.55	0.79	0.56
Observations	75	75	75	75	76	76	76	76

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

French": Alsacien, Basque, Breton, Catalan, and Corsican. Since some of the departments with a non-French dialects were not part of France for the whole period of study and are already excluded from my analysis, the non-French speaking departments in my sample are Corse, Finistere, and Pyrenees Orientales.

[8]These regions are: Northern, Eastern, Western, Central, and Southern France (http://ee.france.fr/en/french-regions).

[9]These results are robust to the use of different cut-offs for the Conley standard errors.

Table A.6: Negative relationship between religiosity and industrialization – controlling for region fixed effects

Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
	(1)	(2)	(3)	(4)
			weighted by pop.	
Share Refract. Clergy	-0.127*	-1.119***	-0.160**	-1.350***
	(0.075)	(0.332)	(0.076)	(0.419)
Controls	✓	✓	✓	✓
Region FE	✓	✓	✓	✓
R^2	0.72	0.58	0.85	0.59
Observations	79	79	79	79

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.7: Religiosity and industrialization (post-1870) – Conley standard errors

Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
	(1)	(2)	(3)	(4)
Share Refract. Clergy	-0.146	-0.861	-0.154	-1.139
	(0.085)	(0.397)	(0.073)	(0.296)
	[0.093]	[0.452]	[0.074]	[0.285]
Controls			✓	✓
R^2	0.04	0.06	0.60	0.56
Observations	83	83	79	79

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col.1. Robust standard errors are in ( ) and Conley standard errors in [ ]. These are computed using the geographic location of main city in each department and assuming a cut-off window of 100 kms.

Table A.8: Negative relationship between religiosity and industrialization – excluding Paris (Seine department)

Dependent Variable:	Share Ind. Workers, 1901	Machines pc, 1891	Share Ind. Workers, 1901	Machines pc, 1891
	(1)	(2)	(3)	(4)
			weighted by pop.	
Share Refract. Clergy	-0.136*	-0.875***	-0.180**	-1.067***
	(0.075)	(0.240)	(0.079)	(0.315)
Controls	✓	✓	✓	✓
R^2	0.57	0.66	0.70	0.68
Observations	78	78	78	78

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

To sum up, the inclusion of many potentially confounding characteristics does not affect the magnitude and significance of the coefficients. This sensitivity analysis suggests that any remaining omitted-variable bias due to unobservables should be modest as well. This is confirmed when I formally analyze the role of unobservables using the Altonji, Elder, and Taber (2005) methodology. Altonji et al. (2005) suggest a method that takes the relationship between the endogenous variable and the observables as a basis to make interference on the relationship between this same endogenous variable and the unobservables. More precisely, under the assumption that unobservables and observables share similar characteristics, selection on observables can be used to assess potential bias from unobservables. In my case, this implies that the variation in the outcome variables related to the observables has the same relationship with religiosity as the part of variation reflecting unobservables. Formally, I calculate a measure showing how much stronger selection on unobservables, relative to observables, should be to explain away the full observed relationship between religiosity and my outcomes. To compute this measure, we should consider two regressions. First, I estimate the coefficient on the share of refractory clergy when running regressions with no controls (as in Table 3) and denote it as β^A. Second, I add the baseline controls (as in Table 4) and denote the coefficient on the share of refractory clergy by β^B. The Altonji et al. ratio is given by $\beta^B/(\beta^A - \beta^B)$. The larger β^B, the stronger is the effect left after controlling for observables – and the more would unobservables have to explain in order to reduce the coefficient to zero. As for the denominator, the smaller is the difference between β^A and β^B, the less is the estimated coefficient influenced by observables – and the stronger would selection on unobservables have to be to explain away the effect.

Table A.9 presents the results for the original Altonji et al. ratio and for the Oster's (2017) correction. The latter takes into account by how much the overall fit improves when adding controls. The R^2 increases from 0.029 to 0.596 when the dependent variable is the share of industrial employment, and from 0.085 to 0.557 when the dependent variable is the number of industrial machines per capita. This suggests that the observables included account for a large part of the overall variation. Both Altonji et al. ratios are negative, implying that the observable controls are negatively correlated with industrial outcomes and positively with religiosity (or vice-versa). When using the Oster's correction, I obtain positive ratios. These imply that, to attribute the entire OLS estimate to selection effects, selection on unobservables would have to be at least 4.23 times greater than selection on observables. In my view, these findings further suggest that it is unlikely that the estimated effect of religiosity is driven by unobservables.

Table A.9: Altonji and the role of unobservables

Controls in restricted set	Controls in full set		Share Ind. Workers, 1901	Machines pc 1891
None	Baseline			
Original Altonji-Elder-Taber test			[<0]	[<0]
Oster correction of the Altonji-Elder-Taber test			13.59	4.23
		R^2 *uncontrolled*	0.029	0.085
		R^2 *controlled*	0.596	0.557

Notes: The table uses the Altonji, Elder, and Taber (2005) methodology and reports the relative strength of selection on unobservables necessary to completely explain away the effect of share of refractory clergy on the different outcome variables.

Additional robustness checks: within-department analysis

Figure A.1 shows the spatial distribution of the share of refractory clergy at the district level.

Then, Table A.10 reproduces the results of Table 5 using (log) household expenditure at the district level. This is computed as the canton population-weighted average of (log) household expenditure.[10] The results on religiosity hold. Finally, Table A.11 focuses on the pre-1870 period. It uses as outcome variable district-level data on the number of firms in three key sectors of the First Industrial Revolution, i.e., cotton spinning, metallurgy, and paper milling. The main variable of interest is the share of refractory clergy.

Similar to the main specifications for the post-1870 period (Table A.10), I include department fixed effects and the baseline controls.[11] The within-department analysis supports the department-level results: the coefficient on the share of refractory clergy is not significantly associated with the industrialization outcome in the pre-1870 period. At the same time, the presence of knowledge elites, who were key for the economic take-off during the First Industrial Revolution is positively and significantly associated with the industrialization outcomes. Finally, at the bottom of the table, I report the standardized beta coefficients. Compared to the post-1870 period, these are much smaller in magnitude.

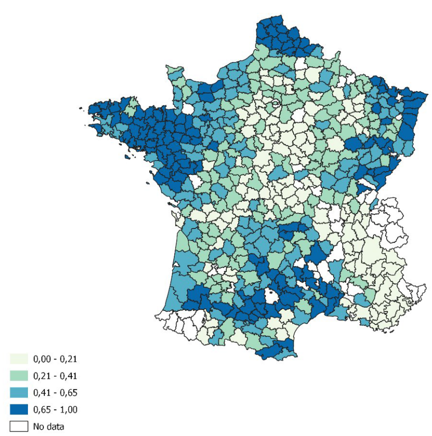

Figure A.1: Religiosity in 1791

Notes: The figure shows the spatial distribution of the share of refractory clergy in 1791 (at the district level). The map is obtained by using quartiles of the share of refractory clergy.

[10]Canton population is measured in 1894.

[11]To my knowledge, population data at the district-level for the early 1800s do not exist.

Table A.10: Negative relationship between religiosity and economic development during the 2nd Industrial Revolution – within-department analysis

Dependent Variable:	(Log) Household Expenditure, 1901				
	(1)	(2)	(3)	(4)	(5)
Share Refract. Clergy	-0.050**	-0.058*	-0.060**	-0.053*	-0.059*
	(0.024)	(0.030)	(0.030)	(0.030)	(0.031)
Population	0.035***	0.026***	0.027***	0.027***	0.020**
	(0.009)	(0.008)	(0.008)	(0.008)	(0.009)
Wheat Suitability			-0.001	-0.001	-0.001
			(0.006)	(0.006)	(0.006)
Distance from Paris				-0.053	-0.051
				(0.035)	(0.035)
Knowledge Elites					0.004
					(0.003)
Department FE		✓	✓	✓	✓
R^2	0.06	0.52	0.49	0.50	0.50
Observations	410	410	397	397	397
Magnitude: Share Refractory Clergy					
stand. beta coeff.	-0.155	-0.179	-0.187	-0.167	-0.185

Notes: All regressions are run at the district level. (Log) household expenditure is a proxy for (log) household income (see footnote 27). Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01. The last row reports the standardized beta coefficients.

Table A.11: No significant relationship between religiosity and industrialization before 1870 – within department analysis

Dependent Variable:	(Log) number of industrial firms, 1800s				
	(1)	(2)	(3)	(4)	(5)
Share Refract. Clergy	-0.100	0.079	0.094	0.110	-0.149
	(0.186)	(0.335)	(0.339)	(0.333)	(0.344)
Wheat Suitability			0.018	0.019	0.010
			(0.067)	(0.067)	(0.070)
Distance from Paris				-0.135	-0.046
				(0.331)	(0.342)
Knowledge Elites					0.117***
					(0.041)
Department FE		✓	✓	✓	✓
R^2	0.00	0.31	0.31	0.31	0.34
Observations	410	410	397	397	397
Magnitude: Share Refractory Clergy					
stand. beta coeff.	-0.029	0.023	0.027	0.032	-0.043

Notes: All regressions are run at the district level. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01. The last row reports the standardized beta coefficients.

Additional robustness checks: difference-in-differences analysis

Here, I use the share of industrial employment from 1866 to 1911 to perform additional robustness checks in a difference-in-differences framework. Figure A.2 plots the per-period coefficient of the share of industrial employment on religiosity. This is obtained from a regression that, rather than interacting "Share Refractory Clergy" with a post-1871 indicator variable, interacts the religiosity measure with each of the time-period fixed effects. The baseline time-period is 1866. The estimated coefficients show how the negative relationship between religiosity and the outcome variable increases in magnitude during the Second Industrial Revolution, becoming particularly large in the late 1890s and in early 1900s.

Figure A.2: Religiosity and industrial employment

Notes: The figure plots the per-period coefficient of the share of industrial employment on religiosity. The baseline time-period is 1866. The bars represent 90 percent confidence intervals.

In addition, one concern could be that other department characteristics (especially those associated with religiosity) also started to matter during the period of the Second Industrial Revolution. Table A.12 uses the same specification of Table 6 (col. 3) and performs a difference-in-differences analysis, using (one by one) the baseline controls (listed in Table 1, col. 1) rather than the share of refractory clergy. Among them, only (log) population and the *Pays d'Elections* dummy were significantly associated with the intensity of Catholicism (Table 1). The interaction between these variables and the $Post1871$ indicator is not significant in the difference-in-differences specification – and neither is the interaction between the other controls and *Post1871*.

Table A.12: Difference-in-differences: What else changed during the 2nd IR?

Dependent Variable: Share of Industrial Employment, 1871-1911

	Pop. 1851	Temp.	Precip.	Wheat Suit.	Pre-ind Activ.	Distance Paris	Pays Elect.	Enroll. Rate 1851	Knowl. Elites
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Control**Post*	-0.000	-0.003	-0.015	0.004	-0.003	-0.008	-0.004	0.030	0.002
	(0.011)	(0.020)	(0.020)	(0.004)	(0.008)	(0.009)	(0.010)	(0.025)	(0.003)
Department FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Observations	820	820	820	790	830	820	830	830	830

Notes: All regressions are run at the department level. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

A.2 Religiosity, Catholic Education, and economic development: Robustness checks

In this section, I further shed light on the role of primary education in explaining the negative relationship between religiosity and economic development.

Figure A.3 illustrates the timeline of the main educational reforms, from the 1833 *Loi Guizot* to the 1901-1904 *Lois Anti-congréganistes*.

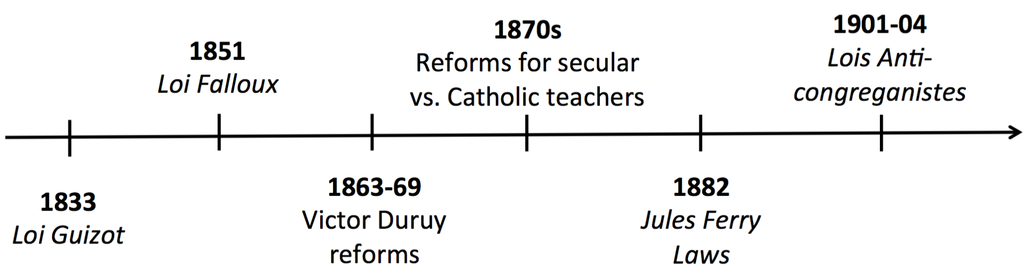

Figure A.3: Timeline of French educational reforms, 1833-1904

Religiosity and Catholic education in the 19th century

Figure A.4 shows the total number (left panel) and the share (right panel) of Catholic and secular schools, without distinguishing between the private and public sectors. It suggests that the total number of Catholic schools, as well as their shares, remained extremely stable throughout the period, despite the effort of the French government to undermine religious education.

Then, Figure A.5 reproduces Figure 3 using the share (rather than the number) of Catholic and secular schools. It shows that the share of Catholic schools remained quite stable throughout the period, with the share of private Catholic schools increasing as their public counterparts were laicized.

Table A.13 uses the share of Catholic students, rather than the share of Catholic schools. Similar to Table 7, columns 1-3 show that departments with a higher share of refractory clergy in 1791 had a higher share of Catholic students, especially after 1850, i.e., when the differences among Catholic and secular education increased. Importantly, columns 4-7 show that in the more religious departments there is also a higher growth in the share of Catholic students, especially in the 1866-1901 period. These findings hold when including the baseline controls of Table 1 (col. 6-7) and when weighting regressions by department-level population (col. 7). Table A.14 use the (log) number of Catholic schools (columns 1-3) and of Catholic students (columns 4-6). It focuses on the two sub-periods of educational reforms (1850-1866, and 1866-1901), controlling for the initial level of Catholic schools

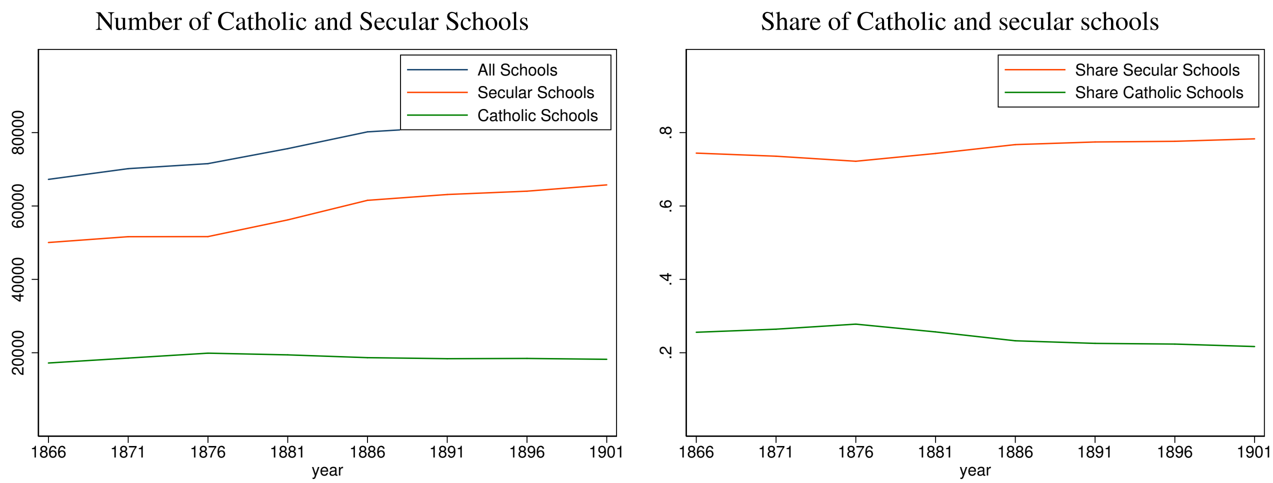

Figure A.4: Catholic and secular schools, 1866-1901

Notes: The left panel shows the number of Catholic schools and secular schools. The right panel shows the share of Catholic schools and secular schools.

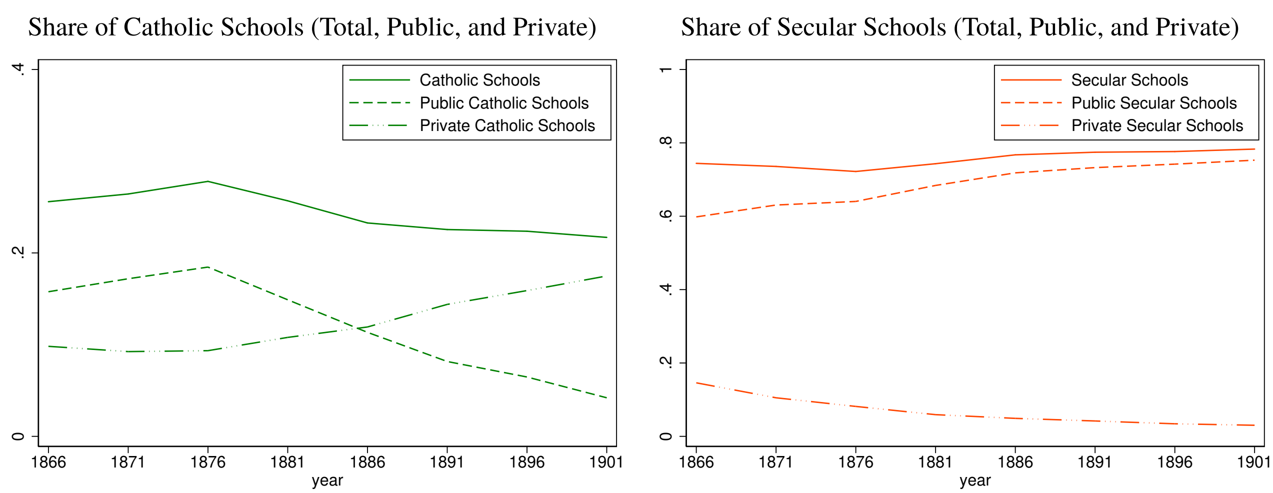

Figure A.5: Share of Catholic and secular schools, 1866-1901

Notes: The left panel shows the share of total Catholic schools, of public Catholic schools, and of private Catholic schools. The right panel shows the share of total secular schools, of public secular schools, and of private secular schools.

and students in 1850 (cols. 1, 3, 4, 6) and in 1866 (cols 2, 5). The results hold.

Table A.15 uses canton-level data on students, separately for male and female students (cols. 1-4) and all together (cols. 5-8). The positive relationship between religiosity and Catholic education holds when distinguishing between genders and when considering all students. This is consistent with historical evidence suggesting that Catholic parents were especially concerned about a Catholic education for their daughters (Franck and Johnson, 2016) but that at the end of the 19th century male Catholic schools represented a strong expression of religiosity (Grew and Harrigan, 1991).[12] Table A.16 shows that changes in the share of Catholic schools are not correlated with changes in state investment on education. This further supports the argument that enrollment in religious vs. secular schools was due to parents preferences for a Catholic education for their children – and that the strong state intervention and investments in secular education did not affect these preferences.

Finally, Table A.17 shows the relationship between religiosity and other measures of human capital. Panel A focuses on the type (cols. 1-2) and quantity (cols. 3-4) of primary education. The dependent variables are the share of students in Catholic schools and the enrollment rate in primary schools. Panel B instead analyzes the type (cols. 1-2) and quantity (cols. 3-4) of secondary education, thus focusing on the share of students attending modern secondary schools (*enseignement special* or *modern* as opposed to the *enseignement classique*) and on share of individuals with secondary education.[13] Interestingly, the share of refractory clergy is negatively and significantly associated only with the type of primary education (cols. 1-2), supporting the historical record on the importance of religiosity for the choice of primary schools, more than for other measures of human capital. This is evident also from the standardized beta coefficients showing that a one standard deviation increase in religiosity is associated with a 0.358 standard deviations increase in the share of Catholic students, and with only a 0.039 standard deviations decrease in the share of students enrolled in modern secondary schools. The non significant relationship between religiosity and secondary education (as already shown in Table 1) could be due to the fact that the latter was addressed to a minority who, by the end of the 19th century, was less likely (than the majority of the population) to be affected by the Catholic antiscientific program. At the same time, there was little department-level variation in primary-school enrollment: at the beginning of the Second Industrial Revolution, enrollment was already high throughout the country, and the 1882 laws made primary school mandatory.

[12] In 1901, female Catholic schools still represented 40% of all female schools, and about 80% of all Catholic schools.

[13] In the panel regressions, I prefer focusing on Catholic schools rather than on Catholic students (because data on students are not always available). However, since I have information only on students in modern secondary schools (but not on schools), to better compare primary and secondary education, in this cross-sectional analysis, I use the share of Catholic students in primary schools. Using information on the share of Catholic schools would yield very similar results, as shown in Table 7.

Table A.13: Higher growth in share of Catholic students in more religious departments

Dependent Variable:	Share Cath. Students			Gr. Share Cath. Students			
	1851	1866	1901	1851-1866	1866-1901		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
							weighted
Share Refract. Clergy	0.039	0.118**	0.215***	0.322*	0.340***	0.333***	0.284***
	(0.060)	(0.059)	(0.051)	(0.186)	(0.105)	(0.110)	(0.103)
Schooling Controls	✓	✓	✓	✓	✓	✓	✓
Controls						✓	✓
R^2	0.19	0.27	0.40	0.33	0.24	0.34	0.28
Observations	82	82	82	82	82	79	79
Magnitude: Share Refractory Clergy							
stand. beta coeff.	0.072	0.207	0.457	0.242	0.445	0.433	0.431

Notes: All regressions are run at the department level. Schooling controls include enrollment rate, the (log) number of students per school, and the (log) number of total schools (measured in the initial period in cols. 4-7). In addition, cols. 1-3 include (log) department population and cols. 4-7 controls for population growth in the period indicated in the header. Cols. 4-7 also control for the initial share of Catholic schools. Controls are those listed in Table 1, col. 1. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. The last row reports the standardized beta coefficients.

Table A.14: Religiosity and Catholic schools/students (levels)

Dependent Variable:	(Log) Cath. Schools			(Log) Cath. Students		
	1866	1901	1901	1866	1901	1901
	(1)	(2)	(3)	(4)	(5)	(6)
Share Refract. Clergy	0.213**	0.455***	0.624***	0.214**	0.520***	0.709***
	(0.082)	(0.141)	(0.162)	(0.102)	(0.154)	(0.182)
Initial Level 1850	0.644***		0.481***	0.688***		0.612***
	(0.048)		(0.078)	(0.062)		(0.094)
Initial Level 1866		0.746***			0.735***	
		(0.093)			(0.086)	
Schooling Controls	✓	✓	✓	✓	✓	✓
R^2	0.90	0.84	0.76	0.92	0.90	0.85
Observations	82	82	82	82	82	82

Notes: All regressions are run at the department level. Schooling controls (all measured at the initial period) include school rate, the (log) number of students per school, and the (log) number of total schools . In addition, all specifications include (log) department population (measured in the initial period). Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.15: Religiosity and Catholic students (canton level)

Dependent Variable: Share of Catholic Students

	by gender				all			
	male		female					weighted
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share Refract. Clergy	0.137***	0.089***	0.269***	0.170***	0.202***	0.131***	0.126***	0.159***
	(0.021)	(0.024)	(0.029)	(0.028)	(0.023)	(0.023)	(0.023)	(0.027)
Schooling Controls	✓	✓	✓	✓	✓	✓	✓	✓
Controls (Canton)							✓	✓
Department FE		✓		✓		✓	✓	✓
R^2	0.19	0.45	0.25	0.56	0.27	0.57	0.57	0.57
Observations	1902	1902	1902	1902	1902	1902	1819	1819

Notes: All regressions are run at the canton level. Schooling controls are the (log) number of students per school, and the (log) number of total schools. In addition, all specifications include (log) canton population. Controls are those listed in Table 1, col. 1, when available at the canton/district level. Standard errors (clustered at the district level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.16: Catholic schools and state spending

Dependent variable: Share Catholic Schools

	(1)	(2)
State Educational Spending	0.001	-0.005
	(0.005)	(0.004)
Schooling Controls		✓
Department FE	✓	✓
Year FE	✓	✓
R^2	0.98	0.98
Observations	414	414

Notes: All regressions are run at the department level. Schooling controls include enrolment rate, the (log) number of students per school, and the (log) number of total schools. Moreover, col. 2 also controls for (log) department population. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.17: Religiosity and type/quantity of education in primary and secondary schools

Primary Education				
Dependent Variable:	Share Stud. in Cath. Schools, 1881		Enrollment Rate 1881	
	(1)	(2)	(3)	(4)
Share Refract. Clergy	0.237***	0.184***	-0.092	-0.055
	(0.058)	(0.057)	(0.057)	(0.046)
Controls		✓		✓
R^2	0.20	0.37	0.05	0.39
Observations	83	79	83	79
Magnitude: Share Refractory Clergy				
stand. beta coeff.	0.450	0.358	-0.213	-0.125

Secondary Education				
Dependent Variable:	Share Stud. in Modern Schools, 1876		Share Pop. with Second. Educ., 1876	
	(1)	(2)	(3)	(4)
Share Refract. Clergy	-0.021	-0.017	-0.027	-0.016
	(0.043)	(0.041)	(0.028)	(0.033)
Controls		✓		✓
R^2	0.00	0.39	0.01	0.11
Observations	83	79	83	79
Magnitude: Share Refractory Clergy				
stand. beta coeff.	-0.052	-0.039	-0.101	-0.061

Notes: All regressions are run at the department level. Controls are those listed in Table 1, col. 1 – except for enrollment rate and knowledge elites. Robust standard errors in parentheses. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Catholic education and industrialization

This section shows a series of robustness checks to further shed light on the role of the type of education (Catholic vs. secular) for industrial development.

Table 10 showed that the negative relationship between the share of Catholic schools and industrial employment holds when I include potentially confounding factors that are not captured by department and year fixed effects. For instance, changes in agricultural productivity could affect both the type of education and employment in industry. Table 10 controls for changes in agricultural yield, using the principal component of the average yield (per hectare) of wheat, rye, and oats, i.e., the three main cereals produced in France at the time. Table A.18 controls for average yield and total cultivated area, separately for the three cereals. The results on education hold. Among the other potentially confounding factors, public budget considerations are probably the most relevant in the context of this study. A challenge for my interpretation could be that increases in government investment (especially in secular-oriented departments) were the dominant factor leading to higher industrialization, while changes in the type of primary education were only a sideshow without economic relevance. In the decades marked by the massive expansion of the railway system, railroads could facilitate market access and industrial development – thus represening a critical confounder. Table 10 controlled for changes in travel costs via the rail network to any other department in France. I now use additional measures of travel costs: (1) changes in travel costs via railways to Paris, which could capture the influence of central institutions and the exposure to new ideas spreading from the capital; (2) density of national roads; (3) expenditure for national roads (per km). Even if roads were not so massively expanded as railways, they could also confound the results. Table A.19 controls for these additional measures of travel costs and the results on the share of Catholic education hold. Table A.16 already shows that changes in Catholic education are not affected by changes in state educational spending; Table A.20 focuses on broader measures of government investment (listed in Tables 10 and A.19) and finds that the share of Catholic schools does not systematically vary with any of them. This further suggests that parents' religious preferences, rather than public budget considerations, are determining changes in Catholic and secular education over time.

While I showed that Catholic education played a key role in explaining the negative relationship between religiosity and economic development during the Second Industrial Revolution, the historical record suggests that differences in the curricula of secular vs. Catholic schools were key. One concern could be that the two types of primary education differed in other important dimensions. Among them, student attendance and schools' resources could be particularly critical. Table A.21 uses as a dependent variable the share of students attending primary schools during summer months in 1876. The explanatory variable is the share of Catholic schools. The results show that the share of Catholic

Table A.18: Industrial employment and agricultural productivity

Dependent Variable: Share Industrial Employment, 1871-1911			
	Wheat	Rye	Oats
	(1)	(2)	(3)
Share Catholic Schools$_{t-10}$	-0.181**	-0.183**	-0.186**
	(0.080)	(0.078)	(0.079)
Yield (per hectar)	-0.004	-0.005	0.010
	(0.007)	(0.010)	(0.008)
Land Cultivated	-0.028**	0.002	0.000
	(0.013)	(0.004)	(0.003)
Schooling Controls	✓	✓	✓
Department FE	✓	✓	✓
Year FE	✓	✓	✓
R^2	0.96	0.95	0.95
Observations	498	497	496

Notes: All regressions are run at the department level. Schooling controls include school rate, the (log) number of students per school, and the (log) number of total schools in $t-10$. In addition, all specifications include (log) department population in t. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.19: Industrial employment and infrastructure

Dependent Variable: Share Industrial Employment, 1871-1911

	(1)	(2)	(3)
Share Catholic Schools$_{t-10}$	-0.176**	-0.189**	-0.182**
	(0.075)	(0.077)	(0.078)
Travel costs to Paris	-0.028		
	(0.055)		
Roads Density		-0.073	
		(0.078)	
Expenditure on Roads (per km)			0.001
			(0.016)
Schooling Controls	✓	✓	✓
Department FE	✓	✓	✓
Year FE	✓	✓	✓
R^2	0.94	0.95	0.95
Observations	410	498	415

Notes: All regressions are run at the department level. Schooling controls include school rate, the (log) number of students per school, and the (log) number of total schools in $t-10$. In addition, all specifications include (log) department population in t. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.20: Catholic schools and government spending

Dependent Variable:	Government	Roads and Railways			
	Subsidies	National	Expenditure	Travel Costs	
	pc	Roads Dens.	on Roads(per km)	to Paris	to any dept.
	(1)	(2)	(3)	(4)	(5)
Share Catholic Schools	-0.097	-0.033	0.109	-0.003	0.138
	(0.191)	(0.222)	(0.645)	(0.195)	(0.138)
Department FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
R^2	0.98	0.97	0.91	1.00	0.99
Observations	581	415	332	328	332

Notes: All regressions are run at the department level. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.21: Catholic schools and summer attendance

Dep. Var.: Share students attending in summer, 1876			
	(1)	(2)	(3)
Share Catholic Schools	0.115	-0.036	-0.021
	(0.074)	(0.067)	(0.066)
Schooling Controls		✓	✓
Controls			✓
R^2	0.03	0.25	0.44
Observations	83	83	79

Notes: All regressions are run at the department level. Schooling controls include school rate, the (log) number of students per school, the (log) number of total schools. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

schools is not associated with student attendance, even when including the schooling controls (col. 2) and the baseline controls (col. 3). Moreover, data from the French National Archives provide detailed information on the quality of school buildings for approximately 2,100 cantons in 1873. Table A.22 uses the share of buildings in bad condition as a proxy for school financial resources. The coefficient on the share of Catholic schools is generally not significant (except for col. 2), suggesting that Catholic schools did not systematically have less resources – if anything, they had a lower share of buildings in bad condition.

Table A.22: Catholic schools and physical facilities

Dep. Var.: Share school buildings in bad condition, 1873

	(1)	(2)	(3)	(4)
Share Cath. Schools	-0.028	-0.044**	-0.027	-0.023
	(0.037)	(0.017)	(0.019)	(0.019)
Schooling Controls			✓	✓
Controls				✓
Department FE			✓	✓
R^2	0.00	0.28	0.28	0.30
Observations	2088	2088	2088	1975

Notes: All regressions are run at the canton level. Schooling controls include the (log) number of students per school, and the (log) number of total schools. In addition, all specifications include (log) canton population in. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

B Source of exogenous variation in religiosity: plague outbreaks during the Reformation

In this section, I provide evidence for a source of exogenous variation in religiosity. Following the recent work of Dittmar and Meisenzahl (2019), I use plague outbreaks during a narrow period (the Protestant Reformation in France, 1517-1598) as an instrumental variable. The Reformation – starting with the circulation of Martin Luther's theses in 1517 – undermined the monopoly of Catholicism, introducing competition in the market for religion (Robert E. Ekelund, Robert F. Hébert, Robert D. Tollison, Gary M. Anderson, and Audrey B. Davison, 1996; Iyigun, 2008, 2015; Dittmar and Meisenzahl, 2019). This represented a "global shock" throughout central Europe and it created an alternative to the Catholic ideology. Importantly, this new religious competition interacted with shocks at the local level. Focusing on German cities, Dittmar and Meisenzahl (2019) show that, once the new doctrine had created an opening for change, the occurrence of plagues discredited the incumbent elites, led to criticism toward the "status-quo," and lowered the price of political action. Religious and political competition at the local level increased and drove the adoption of public goods institutions.[14]

In France too, the Reformation provided an alternative to the Catholic ideology. The decades before the Reformation were characterized by widespread "eschatological anxiety" and by the belief that the world would shortly come to an end (Crouzet and Good, 2001). Pamphlets predicting calamities circulated and natural disasters (such as plagues and floods) were considered God's imminent vengeance upon a sinful society.[15] In this context, the Church had established itself as a monopolistic "provider of salvation." For instance, in 1480, in Le Puy, a procession with the painting *Our Lady of Puy* was organized to receive a remedy from God to end the plague, which was considered a punishment for people's sin (Cohn, 2018). In Metz, a flood that killed animals and destroyed infrastructure was interpreted as a divine punishment, and a collective sense of catastrophe spread throughout the city. The Church pushed people to confess their sins and to receive the communion, and it organized daily processions of expiation. Jean de Bourdigné wrote in *Chronique d'Anjou et de Maine* that around the day of Pentecost, a strong rain was considered a vengeance from God. The community, following the advice of local clergymen, started to "make daily processions, having their children of nine or ten

[14] In the German context, religious competition also took political connotations. On the other hand, the authors show that, before the introduction of religious competition, plague shocks did not lead to institutional change.

[15] These beliefs were spreading across several parts of Europe. From Italy to German lands, a series of prophecies circulated and preachers were predicting enormous disasters. Some of the strongest eschatological tension was felt in Italy in 1513, when Girolamo of Verona (according to the calculations of Joachim of Fiore in the *Concordia Novi et Veteris Testamenti*) announced that his generation would be the last one. A few years later (1524-1525) there was another "case of collective panic." All of Italy, awaited flooding and people bricked up the doors of their houses or built themselves wooden houses in the hills, stock-piled with food (Crouzet and Good, 2001). This approach of the Church was initially common also in German lands – until the mid-16th century, when Catholicism lost consensus.

and older walk barefoot." Analyzing the French religious context of the 16th century, Crouzet concludes that "popular Catholicism in France was steeped in mysticism and apocalypticism and fed by almancas filled with reports of signs and portents and with astrological predictions of disasters and the end of the world."

In this context, the Reformation was immediately welcomed in France. However, the following decades saw frequent persecutions of the Huguenots (the French Protestants).[16] Finally, in 1598, with the Edict of Nantes, Henry IV granted rights to Protestants. The years spanning from the first appearance of the Protestant doctrine to 1598 saw the strongest religious competition in the country. In France, as in the German setting, the global effects of religious competition interacted with local shocks and, where plagues occurred, the prophetic approach of the Catholic Church was further scrutinized: "The Reformation in France heightened attitudes about the forces of good and bad, ... and plagues became a battle hammering out Church positions" (Cohn, 2018, p. 155). Experience with plagues resulted in tensions with the Catholic ideology, in the emergence of early Protestant groups, and in stronger local religious competition.[17] Indeed, embracing the new doctrine "can best be understood as a rejection of this mystical view of the world; its appeal lay in a replacement of the prophetic anguish of Catholicism with a serene assurance of salvation on the part of the elect" (Crouzet, 1996).

Thus, my hypothesis is that, in the period of strongest religious competition, experience with plagues discredited the Catholic doctrine and shifted religious views toward Protestantism.[18]

Following the approach of Dittmar and Meisenzahl (2019), in my empirical analysis, I use variation in plague outbreaks during a limited period as excluded instrument for religiosity. Specifically, I focus on outbreaks during the years of strongest religious competition in France. Historical epidemiologists (such as Biraben, 1975) suggest that, conditional on observables, the short-run occurrence of outbreaks was random, was geographically localized, and did not spread "neighbor-to-neighbor" (Dittmar and Meisenzahl, 2019). Moreover, to deal with the concern that other factors are associated with the occurrence of plagues and also affect economic development, I follow Dittmar and Meisenzahl (2019)

[16]There were many attempts to stop the spread of Protestantism. Some of them (such as the *Affaire des Placards* in 1534 and religious conflicts starting in 1562) got violent. Luther's doctrine spread swiftly across France and, throughout the 16th century, Calvinism became extremely common.

[17]Moreover, contrary to what happened in German cities, higher local religious competition was not conducive to institutional change. This was likely due to the uncertain (often illegal) status of Protestantism in France.

[18]While religious competition fostered dissensus toward the Catholic Church, the several persecutions dissuaded many from converting to Protestantism. When plague occurred, however, people had "less to lose," and would take the risk of criticizing the status-quo and/or switching to the new religion. Thus, one could interpret plague outbreaks in the 1517-1598 period as shifting the overall distribution of religiosity, leading to a decrease in Catholic religiosity, and, in some cases, to conversion to Protestantism. However, why do plague shocks do not lead to less Catholicism and more conversion to Protestantism in later years? First, the French Catholic Church had become more tolerant (and less subject to criticism) – as also reflected in the promulgation of the Edict of Nantes. Second, and very importantly, after Henry IV had granted rights to Protestants, people could convert more easily – and not only when the occurrence of a shock made conversion the only choice left.

and I control for long-run variation in plagues.

To test my hypothesis, I rely on the work of Biraben (1975), which provides city-level data on the number and year of major outbreaks in European history. Specifically, 3,088 outbreaks were recorded in France from 1347 to 1786, 1,049 of which occurred between 1517 and 1598.[19] Given the disaggregated nature of the data, I can exploit within-department variation in plague outbreaks and religiosity. In particular, for each canton,[20] I compute the share of plagues in the 1517-1598 period over the total number of plagues. Then, since data on religiosity are measured at the district level, I compute the average share of plagues across all cantons in a given district and use it as an instrument for the share of refractory clergy. While the instrument (plague outbreaks) and the dependent variable (household expenditure) are measured at the canton level, religiosity is measured at the district level. This does not allow me to run the the First Stage at the canton level and I, thus, perform my entire 2SLS analysis at the district level, reproducing Table A.10 (which uses the canton population-weighted average of (log) household expenditure).[21]

Table B.1 presents the instrumental variable estimates. The first stage shows that the share of plagues in the 1517-1598 period is a strong predictor of Catholic religiosity in 1791. In the second stage, I obtain large and statistically significant coefficients on the share of refractory clergy. The results hold when adding department fixed effects (cols. 2-4) and when including the baseline controls (cols. 3-4). By controlling for long-run plague outbreaks, I account for underlying differences in canton characteristics, thus identifying off variation in outbreaks during the critical 1517-1598 period. In Table B.2, I further address this issue by studying the relationship between religiosity and plagues in the pre-1517 (cols. 3-4) and post-1598 (cols 5-6) periods.[22] First, I show (as in Table B.1, first stage), that my measure of Catholic intensity is negatively associated with plague outbreaks in the 1517-1598 period (cols. 1-2).[23] At the same time, there is no significant relationship between the share of plagues in the placebo periods and the share of refractory clergy. These findings suggest that the interaction between religious competition and local plague shocks (rather than plagues per se) triggered dissensus toward the Catholic Church and decreased Catholic religiosity.

[19] 1,081 outbreaks occurred from 1347 to 1517, and 958 outbreaks occurred from 1599 to 1786.

[20] City data on plagues map one-to-one into cantons, except for two cases, in which two cities that experienced a plague were located in the same canton. In these two cases, I aggregate city-level plagues information at the canton level.

[21] Alternatively, one could run the first stage at the district level and the second stage at the canton level. By construction, the first stage would be identical to the one shown in B.1. The second stage would use the religiosity measure predicted in the first stage, clustering standard errors at the district level. The results of the second stage (at the canton level) would hold – and be even stronger.

[22] These variables are constructed analogously to plagues in 1517-1598. The pre-1517 plagues, consider outbreaks occurring in the 1347-1517 period. The post-1598 plagues includes outbreaks occurring in the 1599-1786 period. Considering in the untreated period the same number of years as in the "treated" period would not change the results.

[23] I partly reproduce the results of the First Stage (B.1) to directly compare the treated and placebo periods in the same table, using the same specifications.

Table B.1: IV Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Second Stage	Dep. Var.: (Log) Household Expenditure, 1901					
Share Refract. Clergy	-0.558**	-0.687*	-0.342*	-0.392*	-0.391*	-0.468*
	(0.281)	(0.353)	(0.186)	(0.214)	(0.218)	(0.278)
First Stage	Dep. Var.: Share Refractory Clergy					
Plagues, 1517-1598	-0.455**	-0.314**	-0.419***	-0.430***	-0.423***	-0.357**
	(0.194)	(0.139)	(0.137)	(0.137)	(0.139)	(0.141)
Department FE		✓	✓	✓	✓	✓
Total Plagues			✓	✓	✓	✓
Wheat Suitability				✓	✓	✓
Distance from Paris					✓	✓
Knowledge Elites						✓
R^2	0.07	0.75	0.76	0.75	0.76	0.76
Observations	410	407	407	397	397	397
KP F-stat	5.49	5.09	11.00	9.84	9.27	6.46

Notes: All regressions are run at the district level and control for (log) population. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table B.2: Plague outbreaks, Catholic intensity, and early Protestantism

Dependent Variable:	Share Refractory Clergy						Early Protestantism	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Placebo Periods					
Plagues, 1517-1598	-0.509**	-0.440***					0.591*	0.431
	(0.218)	(0.147)					(0.350)	(0.348)
Plagues, pre-1517			-0.378	0.182				
			(0.383)	(0.163)				
Plagues, post-1598					-0.291	-0.172		
					(0.248)	(0.138)		
Department FE		✓		✓		✓		✓
R^2	0.01	0.76	0.01	0.75	0.01	0.75	0.06	0.52
Observations	410	410	410	410	410	410	410	410

Notes: All regressions are run at the district level and control for the (log) number of total plagues. Cols. 7-8 also control for (log) distance to Geneva (in km). Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Then, if this dissensus was accompanied by conversion to Protestantism, I would expect a positive relationship between plague outbreaks and the emergence of early Protestant groups. To have information on the initial distribution of Protestantism within France, I digitized data from the *Livre des habitants de Genève* (Geissendort, 1957). This is a list of French Protestant refugees in Geneva from 1549 to 1560, from 1572 to 1574, and from 1585 to 1588, with details on their city of origin.[24] For each district, I compute the share of cantons from which French refugees escaped to Geneva and use this as my measure of early emergence of Protestantism within France. Geissendort (1957) suggests that refugees in Geneva originated from throughout the French territory and should represent the geographical distribution of early Protestantism in the country. Thus, Columns 7-8 of Table B.2, use as dependent variable the early spreading of Protestantism and show positive coefficients on plague outbreaks.

One concern could be that the findings are confounded by the presence of Protestants, who are usually associated with entrepreneurship and economic development. However, this does not seem to be case, for two main reasons. First, Sunshine (2003, p.17) suggests that in the early 16th century, "there is not a clear connection between social class and occupation, and adherence to either Protestantism or Catholicism." Rather, several Christians simply recognized the Church's many problems and asked for reforms. Thus, the conversion to Protestantism was motivated by religious rather than by economic factors (Rothrock, 1979).[25] Second, while the occurrence of outbreaks decreased Catholic religiosity and fostered the emergence of early Protestant groups, after the strong persecutions against the Protestants and the subsequent massive migration waves, only a small minority of these groups had survived by the mid-17th century (Greengrass, 1987; Mours, 1958). Indeed, the distribution of Huguenots in the 19th century is not associated with Catholic intensity (as shown in Table 1).

Thus, all these findings together suggest that plagues occurring in the years of strong religious competition – and not plagues as such – are predicting Catholic intensity in later centuries.

Next, to be a valid instrument the exclusion restriction would require that cities with more outbreaks became more developed only because of their lower religiosity. However, plagues could affect economic development through different channels, such as through their demographic consequences. If this is the case, then plague outbreaks before and after the period of high religious competition should also affect economic development. Thus, to assess the validity of my IV estimates, I perform

[24] Already in 1534 (with the *Affair des Placards*) and, even more, with legal repressions of Protestants in the subsequent decades, French refugees had migrated to Geneva. By the end of the 1540s, there were so many that the city council decided to keep a register.

[25] Similarly, Becker and Woessmann (2009) argue, for the case of Prussia, that wealthy regions may have been less likely to select into Protestantism at the time of the Reformation because they benefited more from the hierarchical Catholic structure. Only later, when Protestants had invested in education and literacy (originally needed for religious reasons), did they become an economically successful minority.

falsification tests that examine the reduced-form relationship between plagues before 1517 or after 1598 and economic development. Table B.3 shows the results. There is a strong and positive relationship between plague outbreaks in the 1517-1598 period and my measure of economic development, also when including department fixed effects (cols. 1-2). Columns 3-6 report the same reduced-form estimates for both the pre-1517 period (cols. 3-4) and the post-1598 period (cols. 5-6). Unlike plagues occurring in 1517-1598, there is no systematic relationship between the occurrence of outbreaks before 1517 or after 1598 and economic development. At the bottom of the table, I report the standardized beta coefficients: these are much larger in magnitude in the period of strong religious competition than in the placebo periods.[26]

Table B.3: Reduced form relationship between plagues outbreaks and economic development

Dependent Variable: (Log) Household Expenditure, 1901

	(1)	(2)	(3)	(4)	(5)	(6)
	Relig. Competition Period		Placebo Periods			
	1517-1598		pre-1517		post-1598	
Plague Outbreaks	0.212**	0.165*	-0.076	-0.062	0.042	-0.070
	(0.088)	(0.096)	(0.110)	(0.124)	(0.062)	(0.078)
Department FE		✓		✓		✓
R^2	0.07	0.53	0.05	0.52	0.05	0.52
Observations	410	410	410	410	410	410
Magnitude: Plague outbreaks						
stand. beta coeff.	0.123	0.096	-0.039	-0.032	0.031	-0.051

Notes: All regressions are run at the district level and control for (log) number of total plague and (log) population. Standard errors (clustered at the department level) in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

[26] This reduced-form relationship could also be studied using canton-level data, since both plague outbreaks and (log) household expenditure are available. To be consistent with the rest of the instrumental variable regressions, I perform the analysis at the district level. The canton-level results would be even stronger.

C Data: Description and sources

C.1 Information on French departments, districts, and cantons

The variables used in this paper are measured at three different geographical levels: departments, districts, and cantons. While departments and cantons, created during the French Revolution, are still in place today (despite some changes in their number over time), districts only existed for approximately five years. Below I describe the three different geographical units.

Departments

A large part of my cross-sectional analysis and the entire panel analysis are performed at the French department level. Departments were created in 1789 by the National Constituent Assembly. The idea was that the *chef-lieu* (main city) of every department had to be located at no more than 24 hours on horseback from any town in the same department. Initially, there were 83 departments. That number increased to 130 during the Napoleonic period and, in 1815, with the Congress of Vienna, it was reduced to 86 (three of the initial departments were split). In 1860, also the departments of Savoie and Haute-Savoie were annexed to the French territory. After the Franco-Prussian war instead, France lost the departments of Haut-Rhin and of Bas-Rhin (except for the Territoire de Belfort, which was officially recognized as a department only in 1922), as well as a very large area of the departments of the Moselle and Muerthe departments (the remaining part of Moselle and Meurthe were merged into Meurthe-et-Moselle). Hence, since the borders of the French territory changed over time, my analysis does not include Meurthe, Moselle, (Meurthe-et-Moselle), Haut-Rhin, Bas-Rhin (and Belfort), Savoie and Haute-Savoie, leading to a total of 83 departments.

Cantons

Cantons (metropolitan areas) are the lowest geographical units of my analysis – they are just above the communes. Cantons, also created during the French Revolution, were typically composed of a main city and a few smaller towns or villages. In 1801, departments were divided into 2,916 cantons. The number of cantons varied little until 1914:[27] there were 2,860 cantons in 1876 and 2,911 in 1901. Focusing only on the 83 departments that were part of France for the whole period of study, there were 2,770 cantons in 1876, and 2,817 cantons in 1901. Household expenditure in 1901, and the newly digitized schooling data (1873 and 1894) are measured at the canton level.

[27] The number of cantons, instead, increased sharply after the 1970s, reaching, in 2013, approximately 3,600 cantons (and 4,000 when including cantons covering only fractions of large cities, rather than the entire city). In 2,013 then an important reform reduced again their number to 2,054.

Districts

Districts represent the geographical unit between departments and cantons. Districts have been in place for approximately five years during the revolutionary period (from 1790 to 1795). My main measure of religiosity, the share of refractory clergy, is measured at the district level. To the best of my knowledge, data on districts boundaries are not available from official sources. To match 19th-century cantons (metropolitan areas) into 1790-95 districts (as well as to generate district boundaries), I use data from the *Cartes de Cassini*, very kindly shared by Victor Gay. For each of the approximately 36,000 communes, the Cassini database provides information on its 1790-1795 district. At the same time, for each of these communes, I have information on the cantons and departments they belong to. The objective is to create a dataset where each canton is matched to a district and each district to a department. I proceeded in two steps.

1. I pair each district into a department. This is the department which the majority of communes and population (measured in 1793) of the district belongs to. There were 523 districts in the 83 departments of my analysis – with each department including from a minimum of 3 (e.g., the departments of Ariege or Loire) to a maximum of 10 districts (the Vosges department). Data on religiosity are available for 475 of these districts.[28]

2. I pair each canton into a district. This is the district which the majority of communes and population (measured in 1793) of the canton belongs to.[29]

C.2 Outcomes variables

Share of workers in industry in 1901 – department level (cross-sectional analysis)

The share of industrial workers in 1901 is constructed as the share of workers (*ouvriers*) in industry over the total number of workers (which include workers in industry; agriculture; commerce; and liberal professions). Source: 1901 French censuses (*Recensement Général*).

Share of workers in industry in 1866 – department level (cross-sectional analysis)

The share of industrial workers in 1866 is constructed as the share of workers (*ouvriers*) in industry over the total number of workers (which include workers in industry; agriculture; commerce; activities related with industry, agricultural commerce; and liberal professions). Source: 1866 French censuses (*Recensement Général*).

[28] To check the accuracy of the district-department match, I compare it with Tackett (1986), that, for each district where data on refractory clergy is available, provides the name of the respective department.

[29] To check the accuracy of the canton-district match, I compare the department attributed to the canton through the canton-district match with the department to which the canton effectively belongs.

Industrial machines per capita in 1891 – department level (cross-sectional analysis)

Industrial machines per capita in 1891 is computed as the number of machines per 1,000 inhabitants. Machines include fixed steam engines, as well as locomotives, and steamrollers. Source: *Annuaire Statistique de la France*.

Steam engines per capita in 1839-1847 – department level (cross-sectional analysis)

Data on steam engines are provided at the arrondissement level.[30] I aggregate them at the department level and compute the number of steam engines per 1,000. Source: Chanut, Heffer, Mairesse, and Postel-Vinay (2000).

(Log) household expenditure in 1901 – canton level (cross-sectional analysis)

Household expenditure measures (canton-level) monthly expenditure for a household of four people; it is a proxy for household income.[31] Source: 1901 *Salaire et cout de la vie*.

(Log) Number of firms in 1800s – district level (cross-sectional analysis)

(Log) number of firms in 1800s include firms in three fast-growing sectors of the First Industrial Revolution, i.e. cotton spinning, metallurgy, and paper milling. Data on firms in cotton spinning are from 1806, in metallurgy from 1811, and in paper milling from 1794. Source: Juhász, Squicciarini, and Voigtländer (2019).

Share of workers in skill-intensive sectors in 1896 – department level (cohort analysis)

I use data on workers by industrial sector and worker cohort in 1896. For each cohort, I compute the share of workers in skill-intensive sectors. Cohorts are defined as workers between 15-24, 25-34, 35-44. Based on historical literature, I classify the transformation and transport sectors as skill-intensive – as opposed to the fishing, agriculture, and mining sectors. Source: 1896 *Enquéte industrielle*

Share of industrial employment 1871-1911 – department level (panel analysis)

In the panel analysis, the share of industrial employment is constructed as the share of employment in industry over the active population. These information are available every five years from 1866 to 1911. Since the classification of industrial employment within different categories (e.g., *ouvriers*, *journaliers*, *employés*, *chefs d'établissement*) changes across the different censuses (and, in some cases, two of these categories are reported jointly), I do not focus on workers (*ouvriers*) only, but I study the entire population active in the industrial sector. Family members and servants (of people working in the industrial sectors and of the entire active population) are not included. Source: French

[30] Arrondissements replaced districts. In the mid-19th century, there were approximately 350 arrondissements in France.

[31] Data on household expenditure are available for 1,522 cantons. These cantons are located in 483 (out of 523) districts and in all 83 departments. Among them, 1,113 also have data on religiosity and population. The 1,113 cantons are located in 410 districts and in 75 departments.

censuses (*Recensement Général*), different years.
Digitized data are available at https://www.insee.fr/fr/statistiques/2591397.

C.3 Indicators of religiosity

Share of refractory clergy in 1791 – district and department levels

The share of refractory clergy is computed as the share of clergy that did not swear the oath of allegiance to the Constitution (*nonjurors*) over the total number of clergy in 1791. For the vast majority of cases (95%), information on *jurors* are reported for the first quarter of 1791 (when the government required the clergy to swear the oath). For 5% of districts, I use information reported for later months. Data are provided at the district and department levels. For the department-level analysis, I compute the average share of refractory clergy across all districts in a given department. This allows me to have information on religiosity for 80 departments. For 3 departments, data are not reported at the district level (but only at the department level). I add this information and obtain data on religiosity for all 83 departments of my sample.[32] Source: Tackett (1986).

Cahiers de Doléances in 1788 – department level

For each of the 233 *bailliages* (electoral disctricts) and (generally) for each of the three estates, Hyslop (1934) provides a list of 49 content categories mentioned in the *cahiers de doléances*. I identified four categories reflecting antireligious attitudes. For each *bailliage*, I compute the share of antireligious categories in the *cahiers* of the third estate. In the same way, I also compute the share of conservative categories. I then match the 233 *bailliages* to the departments in my sample and compute the department-level average. Eight departments that report data on the share of refractory clergy have no information on the the *cahiers de doléances*. I end up with 75 observations. Source: Hyslop (1934)

Share of readers of the newspaper La Croix in 1893 – department level

The share of readers of the newspaper *La Croix* in 1893 is an index ranging from 1 to 4. Source: (Cholvy and Hilaire, 2000).

Church attendance in the 1950s – department level

Church attendance captures the share of people attending the Sunday Mass in the 1950s. Source: Isambert and Terrenoire (1980)

Priest ordinations per capita in the 1950s – department level

Priest ordinations per capita in the 1950s is measured as an index ranging from 1 to 6. Source: Godfrin and Godfrin (1965).

[32] Using the department-level data for the department-level analysis (rather than aggregating the district level information) would provide almost identical results.

C.4 Schooling data

Primary education (several years) – department level

Data on primary education at the department level include:

- Share of Catholic schools (students), computed as the number of Catholic schools (students) over the total number of schools (students).
- Enrollment rate, computed as the total number of students over the school-age population (5 to 15 years) – students include both Catholic and secular students.
- Total schools, computed as the (log) number of schools – schools include both Catholic and secular schools.
- Students per school, computed as the (log) of the total number of students over the total number of schools – students/schools include both Catholic and secular students/schools.

Source: *Statistique de l'enseignement primaire*.

Primary education, 1873 and 1894 - canton level

Data on primary education at the canton level include:

- Share of Catholic schools (students), computed as the number of Catholic schools (students) over the total number of schools (students). Data on students are available for the year 1894 only.
- Total schools, computed as the (log) number of schools – schools include both Catholic and secular schools.
- Students per school, computed as the (log) of the total number of students over the total number of schools – students/schools include both Catholic and secular students/schools.
- Share of building in bad conditions, computed as the number of school buildings in bad condition over the total number of school buildings. The quality of schools buildings could be good (*bonne*), adequate (*passable*), or bad (*mauvaise*). Data on schools buildings are available for the year 1873 only.

Data on schooling and religiosity are available for approximately 2,100 cantons in 1873 and for 1,900 cantons in 1894.[33]

[33] In 1873, schooling data are available for about 2,400 cantons. These cantons are located in 493 (out of 523) districts and in the 82 departments. Among them, approximately 2,100 also have data on religiosity. These are located in 445 districts and in 78 departments. Considering cantons for which data on all schooling variables and population are available, I end up with 2,065 observations.
In 1894, schooling data are available for approximately 2,550 cantons. These are located in 522 (out of 523) districts and in all 83 departments. However, in the year 1894, data for private and public schools were reported separately – and those for private schools are more scarce. It is hard to know whether there were no private schools in some cantons or whether private schools records got lost; I decided to focus on those cantons for which records for both private and public schools exist. This leads me to 2,174 cantons (located in 505 districts and in 82 departments). Among them, approximately 1,979 also have data on religiosity. These are located in 458 districts and in 78 departments. Considering cantons for which data on all schooling variables and on population are available, I end up with 1,891 observations. Importantly, the results hold when using all cantons (i.e., also those for which only public schools records are kept).

Source: *Statistique Générale de la France* (National Archives - Series: F17)

C.5 Control variables: cross-sectional analysis

Population (several years) – department level

Population is measured as (log) total population at the department level. Source: *Recensement Général*. Digitized data are available at http://acrh.revues.org.

Population, 1873 and 1894 – canton level

Population is measured as (log) total population at the canton level. Source: *Statistique Générale de la France* (National Archives - Series: F17)

Average temperature and precipitation – department level

Average temperature and precipitation are measured over the 1701-1800 period. Source: Franck and Michalopoulos (2017).

Wheat suitability – district and department levels

Wheat suitability measures wheat soil suitability. These data are provided at the district and at the department levels. Source: Finley, Franck, and Johnson (2017).

Pre-industrial activities – department level

Pre-industrial activities include the total number of mines, forges, iron trading locations, and textile manufactures. I use data on the local density of pre-industrial activities as constructed by Squicciarini and Voigtländer (2015). Source: Squicciarini and Voigtländer (2015).

Distance from Paris – canton and department levels

Distance from Paris is the (log) distance (in km) from Paris. In the department-level analysis, this is computed using the distance from Paris to the main city (*chef-lieu*) of each department. Since not all cantons have a (*chef-lieu*), in the canton-level analysis, this is computed as the average of the distance from Paris across all communes in a given canton.

Pays d'élection – department level

While France was a centralized state already before the French Revolution, in some regions, the *pays d'élection*, the king (before 1789) exerted particularly strong power in fiscal and financial matters (a representative of the royal administration was directly responsible for the assessment and collection of taxes). In contrast, the *pays d'état* and the *pays d'imposition* enjoyed higher autonomy in terms of taxation. I use a dummy for departments located in *pays d'élection*. Source: Le Bras (1986).

Knowledge elites – canton and department levels

Knowledge elites are measured as the (log) number of subscribers to the *Éncyclopedie* of Diderot and d'Alembert. This information is available at the city level. I aggregate it at the canton and department levels. Source: Squicciarini and Voigtländer (2015)

Share of secondary educated individuals in 1876 – department level

The share of secondary educated individuals represents the share of the population enrolled in secondary schools in 1876. Source: *Statistique de l'enseignement secondaire*.

Share of students in modern secondary schools in 1876 – department level

The share of students in modern secondary schools is computed as the number of students enrolled in modern secondary schools over the total number of students attending secondary education in 1876. Modern secondary schools refers to the *enseignement special* or *modern*, as opposed to the *enseignement classique*. Source: *Statistique de l'enseignement secondaire*.

Huguenots per capita in 1861 – department level

Huguenots per capita in 1861 is computed as the share of Huguenots in the population in 1861. Source: Mours (1958).

Average farm size in 1862 – department level

Farm size measures the (log) average farm size in 1862. Source: Finley et al. (2017)

Value of agricultural production per capita in 1892 – department level

This is computed as the value of agricultural production over the total department population. Agricultural production includes cereals production and animal husbandry. Source: Bignon and García-Peñalosa (2018).

Density of the railway system in 1879 – department level

Railways density represents the (log) km of the railway network divided by total department surface in 1879. Source: *Annuaire Statistique de la France*.

C.6 Control variables: panel analysis

Baseline controls – department level

In the baseline specification, I control for department-level population, school rate, the number of students per school, and the total number of schools. These variables have been described above.

Fertility rate – department level

Fertility rate is measured as the I_g Princeton index. This is constructed as the ratio of births that married women in a given population actually have to the number they would have if subject to the maximal age-specific fertility schedule. This is considered a less coarse measure than the crude birth rate (Daudin, Franck, and Rapoport, 2018). Fertility is measured every five year, from 1861 to 1901. Source: Murphy (2015)

Share of vaccination – department level

The share of vaccinations is computed as the number of people vaccinated over the total number of people needing vaccinations. The latter include the number of children born and number of people infected (computed as the average of people infected in the period of analysis and in the previous period). The results are robust to different measures of people infected. Since vaccinations were provided not only to newly born (and, indeed, the number of vaccinations is sometimes higher than the number of births), using the number of people needing vaccinations is better capturing the diffusion of this modern medical practice. This variable is measured every five year, from 1866 to 1881. Source: *Rapport sur les vaccinations pratiquées en France.*.

Phyloxxera dummy – department level

Between 1863 and 1890, the phyloxxera destroyed 40% of French vineyards and represented one of the most dramatic and devastating agricultural shocks in France (Meloni and Swinnen, 2014; Banerjee, Duflo, Postel-Vinay, and Watts, 2010). I use the Galet (1957) dummy (provided in Bignon, Caroli, and Galbiati (2017)) indicating the year where the phylloxera aphids were first spotted in a department. This is measured every five years from 1861 to 1901. Source: Bignon et al. (2017).

Cereal Yield (per hectare) – department level

Cereal Yield (per hectare) is the principal component of average yield (per hectare) of the three main cereals produced in France in the late 19th century: wheat, rye, and oats. This is measured every five year from 1876 to 1906 – except for the year 1891. Source: *Annuaire Statistique de la France*.

Land Cultivated – department level

Land cultivated measures the (log) of total land surface where wheat, rye, or oats are grown. This is measured every five year from 1876 to 1906 – except for the year 1891. Source: *Annuaire Statistique de la France*.

Immigration – department level

Immigration is computed as the number of immigrants per 10 inhabitants. These only include immigrants from other French departments, since foreign immigration to France was very limited at the time (Daudin et al., 2018). This is measured every five year from 1871 to 1911 – except for the year 1896. Source: *Recensement Général*.

Share of urban population – department level

The share of urban population is computed as the ratio of urban population over total population. It is measured every five years from 1871 to 1911. Source: *Recensement Général*.

Extraordinary government subsidies pc – department level

Extraordinary government subsidies pc are computed as the extraordinary subsidies that the different departments received from the central government over the total department population. This is measured every five year from 1871 to 1906. Source: *Bulletin des lois de la République française*.

Average travel costs via railways – department level

Using a four step procedure (that takes into account the progressive development of the railroad network, as well as the priceof a train ticket), Daudin et al. (2018) compute a matrix of bilateral time-varying transport costs. In the main specification, I use average travel costs to any departments. In robustness checks, I use travel costs to Paris. These data are reported every 10 years from 1871 to 1911. Source: Daudin et al. (2018).

State spending on education – department level

State spending on education is the (log) state spending on education. These data are available for the years 1876, 1881 and 1901. Source: *Annuaire Statistique de la France*.

National roads density – department level

National roads density is computed as the (log) total length of national roads divided by total department surface. The data are available for the years 1881, 1886, 1896, and 1901. Source: *Annuaire Statistique de la France*.

Expenditures for national roads (per km) – department level

Expenditures for national roads are computed as (log) total expenditure divided by the length of national roads (in km). The data are available for the years 1881, 1886, and 1901. Source: *Annuaire Statistique de la France*.

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Overview of the variables used in the paper (1/3)

Variable Name	**Variable Description**	**Source**
	Outcome Variables	
Share workers in industry	workers in industry divided by total number of workers	Recensement Général
Machines per capita	number of machineries per 1,000 inhabitants	Annuaire Statistique de la France
Steam engines per capita	number of steam engine per 1,000 inhabitants	Chanut et al. (2000)
Household expenditure (canton-level)	(log) household expenditure	Salaire et cout de la vie
Share industrial employment	people active in industry divided by total active population	Recensement Général
Number of firm 1800s	(log) number of firms in cotton spinning, metallurgy, and paper milling	Juhász et al. (2019)
	Indicators of religiosity	
Share refractory clergy	number of clergy not signing the oath divided by the total number of clergy	Tackett (1986)
Share of (anti-)religious *cahiers*	number of “antireligious” contents divided by the total number of contents in the *cahiers*	Hyslop (1934)
Share of readers of *La Croix*	index (from 1 to 4) for the share of readers of *La Croix in 1893*	Cholvy and Hilaire (2000)
Share of Catholic schools in 1901	Catholic schools divided by total number of schools	Annuaire Statistique de la France
Church attendance 1950s	share of people attending the Sunday Mess in the 1950s	Isambert and Terrenoire (1980)
Priests’ ordinations per capita 1850s	index (from 1 to 6) for the priests ordination per capita	Godfrin and Godfrin (1965)
	Data on primary education	
Students per school	(log) number of students divided by total number of schools	Statistique de l’enseignement primaire
Number of schools	(log) number of total schools	Statistique de l’enseignement primaire
Enrollment rate	number of students divided by school-age population (5-15 years)	Statistique de l’enseignement primaire
Share of Catholic schools (canton-level)	Catholic schools divided by total number of schools	National Archives. Series: F17

Overview of the variables used in the paper (2/3)

Variable Name	**Variable Description**	**Source**
	Controls: Cross-sectional analysis	
Population	(log) total department population	Recensement Général
Population (canton-level)	(log) total canton population in 1873 and 1894	National Archives Series: F17
Average temperature	average temperature over the 1701-1800 period	Franck and Michalopoulos (2017)
Average precipitation	average precipitation over the 1701-1800 period	Franck and Michalopoulos (2017)
Soil suitability	wheat soil suitability	Finley et al. (2017)
Pre-Industrial activities	(log) number of pre-industrial centers	Squicciarini and Voigtländer (2015)
Distance from Paris	(log) distance (in km) from Paris	
Pays d'élection	dummy for departments located in *pays d'éléction*	Le Bras (1986)
Knowledge elites	(log) subscriptions to the Éncyclopedie of Diderot and d'Alembert	Squicciarini and Voigtländer (2015)
Share secondary education	secondary-educated individuals divided by total population	Statistique de l'enseignement secondaire
Share modern secondary educ.	students in modern secondary schools divided by total students in second. schools	Statistique de l'enseignement secondaire
Huguenots pc	number of huguenots divided by total population	Mours (1958)
Farm size	(log) average farm size	Finley et al. (2017)
Value agric. production pc	(log) value of agricultural production (cereal and animal husbandry) divided by total population	Bignon and García-Peñalosa (2018)
Railway density	(log) km of railway newtork divided by total surface	Annuaire Statistique de la France

Overview of the variables used in the paper (3/3)

Variable Name	**Variable Description**	**Source**
	Controls: Panel analysis	
Population	(log) total department population	Recensement Général
Phyloxxera	dummy equal to 1 for the year in which a department was hit by the phyloxxera	Bignon et al. (2017)
Fertility rate	I_g Princeton fertility index	Murphy (2015)
Share of vaccination	vaccinations provided divided by the total number of people needing vaccines	Rapport sur les vaccinations
Share of urban population	urban population divided by total population	Recensement Général
Immigration	number of immigrants per 10 inhabitants	Recensement Général
Department subsidies pc	government extraordinary subsidies divided by total population	*Bulletin des lois de la République française*
Avg. travel costs via railway	average travel costs via railways to any departments	Daudin et al. (2018)
	Data used in the robustness checks	
Share of conservative *cahiers*	number of "conservative" contents divided by the total number of contents in the *cahiers*	Hyslop (1934)
Share votes Demo-Socialist party	index (from 1 to 11) on the share of votes to the Democratic-Socialist party	Bouillon (1956)
Share votes Republican party	share of votes to the Republican parties in 1876 and 1893	Avenel (1894)
Avg. travel costs to Paris	average travel costs via railways to Paris	Daudin et al. (2018)
Roads density	(log) length of national roads (in km) divided by total surface	Annuaire Statistique de la France
Expenditure on roads	(log) total expenditure divided by the length of national roads (in km)	Annuaire Statistique de la France
Share of buildings in bad conditions	school buildings in bad conditions over the total number of buildings in 1873	National Archives Series: F17
Share student attending in summer	student attending in summer over total number of student in 1876	Statistique de l'enseignement primaire
Plagues, 1517-1598	number of plagues in the 1517-98 period over the total number of plagues (in 1347-1786)	Biraben (1975)
Early Protestant	share of cantons in a district from where French refugees escaped to Geneva	Geissendort (1957)