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Devotion or Deprivation: Did Catholicism Retard French Development?

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Abstract

Squicciarini (AER, 2020) finds that the parts of France with the most refractory clergy during the Revolution had the lowest industrial employment in 1901, and concludes that Catholicism retarded development. However, because the richest regions were the ones that industrialized, whereas the poorest ones were the most devout, the relationship may be confounded by living standards. If we add a range of simple controls for living standards the claimed result immediately disappears, as it does if alternative measures of religiosity are employed. Regarding education, I find that Catholic schools were established in areas that historically had the fewest public schools and the lowest enrolment of girls relative to boys. Instead of simply indoctrinating children, religious orders appear to have provided a basic education in impoverished places where it was otherwise unavailable, for girls especially.

1 Introduction

Squicciarini (2020) has recently found that the parts of France with the highest share of refractory clergy during the Revolution had the lowest industrial employment in 1901 and concludes that religiosity retarded development. The connection, it is argued, runs through primary education: the most devout areas had the most

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children in schools controlled by the Catholic church in 1866, and the lack of technical education in these institutions prevented these regions from developing the new industries of the Second Industrial Revolution of the late nineteenth century.

However, a fundamental fact of French economic history is that the regions that industrialized successfully were the ones that been most prosperous for centuries previously, with better soil, higher wages and greater literacy. The unusually strong correlation among French data series makes it fairly easy to find some variable that is associated with deprivation, such as religiosity, and to argue that it must be at the root of under-development.

To make sure that the observed correlation between religiosity and industrialization is not being confounded by living standards, we need to add direct controls for living standards. If we simply add a dummy for the more prosperous north and east of France, Squicciarini's claimed connection between religiosity and industrialization immediately disappears. Alternatively, including 1852 wages from Squicciarini and Voigtländer (2015) as the control has the the same effect. Other controls that cause the impact of Catholicism on industrialization to disappear include patents, urbanization, business tax receipts—all for the early 1830s—and soil quality.

Although Squicciarini is concerned with testing the impact of devoutness on industrialization, the analysis rests on a single measure of religiosity: the fraction of clergy who refused to swear loyalty to the Revolution in 1791. Their refusal may actually tell as much about political attitudes at the time as religious ones, so it is worthwhile to explore other measures of Catholic devotion by way of a robustness check.

Several measures of Catholicism were compiled for the years around 1830 by two of the pioneers of social statistics, André-Michel Guerry and Adolph d'Angeville. In his 1833 *Moral Statistics of France* Guerry gives the number of clergy and of donations to the church, ranked by département. Angeville (1836) reports the share of conscripts who were clerical students and, what he argues to be the most informative measure of *le zèle religeux*, the value of donations made for the spe-

cific purpose of propagating the Catholic faith (pp 103–104).[1] When the share of refractory clergy is replaced by any of these measures of piety—which, unlike refractory clergy, are not simple correlates of backwardness—the claimed connection between devotion and under-development again disappears, even before controlling for living standards.

For Squicciarini, the link that connects religiosity to industrialization is the substandard education provided by Catholic schools, more concerned with indoctrinating children than teaching them useful things. To assess this claim, we need to remember two things about nineteenth century France. Firstly, outside the northeast, much of the country was extremely poor, to the extent that severe physical stunting was widespread. In the early 1830s 15 per cent of army conscripts nationally were rejected for being below the minimum height of 157 cm (62 inches, and double this number in the poorest départements), and another 35 per cent, disproportionately from urban areas, were rejected for poor health (Angeville, 1836).

Secondly, until the 1880s, education received no funding from central government. Public schools had to rely on a combination of municipal funding and fees, with the poorest municipalities having to charge the highest fees. As a result, many of the poor went without any education. In the median département in 1837 only around half of boys and a third of girls attended a primary school of any sort (de la Croix and Perrin, 2018).

To fill this void, specialized Catholic teaching orders (*congrégations*) appeared. With large numbers of nuns and brothers willing to work at subsistence wages and buildings funded by pious benefactors, congregational schools allowed families in cash strapped municipalities to afford some sort of basic education for their children. According to one school inspector in 1845, the spread of congregational schooling had less to do with the religiosity of the population than with the parsi-

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[1]Angeville, who was somewhat preoccupied with the influence of the Catholic church on French society, reports his data on *Catholicisme* in Table 7 between *Criminalité* and *Esprit de Chicane* (litigiousness), arguing that these were highest in religious districts, along with mortality, illegitimacy and abandoned infants. Clerical students (who were exempted from service) are discussed beside the number of recruits who mutilated themselves to avoid the army, on the grounds that both shared a common lack of patriotic ardour (p 58).

mony of municipal counselors; and even inspectors unenthusiastic about Catholic education conceded that it was the only viable way to expand schooling, for girls in particular (Curtis, 1999).[2]

In keeping with this view, I find below that the number of Catholic schools in 1901 is strongly predicted by supply and demand factors. On the supply side, religious donations (but not refractory clergy) have strong explanatory power. On the demand side, the first predictor is the scarcity of public schools, specifically the target number for each département set by the government in the school reforms of 1833. The second predictor is the ratio of girls to boys enrolled: public schools were for boys only. After we control for these deficiencies in public education, refractory clergy no longer explain either the level or the growth of Catholic schooling.

In later sections, Squicciarini examines a panel of industrial output by département from 1866 to 1911. A difference-in-differences regression finds that refractory clergy only began to affect output after 1871, leading to the argument that the defects of Catholic education only began to matter then. However, if we control for school enrolment in 1863 the effect disappears: devotion again acts as a proxy for deprivation. Similarly, a panel regression showing that places with many Catholic schools had the least industry is driven by the backward and de-industrializing west.

2   Historical Background

Until at least 1900 France showed a sharp geographic split along an imaginary line running northeast-southwest, roughly from St Malo to Geneva. As the maps in Figure 1 indicate, the region above the line had considerably higher literacy in the eighteenth century (and a century earlier) and more industry throughout the nineteenth century, along with taller people and higher wages.

The greater prosperity of the north was associated with proximity to Paris, access to navigable rivers and the coast, and better soil. Before the Revolution,

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[2]The historical role of nuns in education, like that of women more generally, has received little attention: a notable exception is Brejon de Lavergnée (2017).
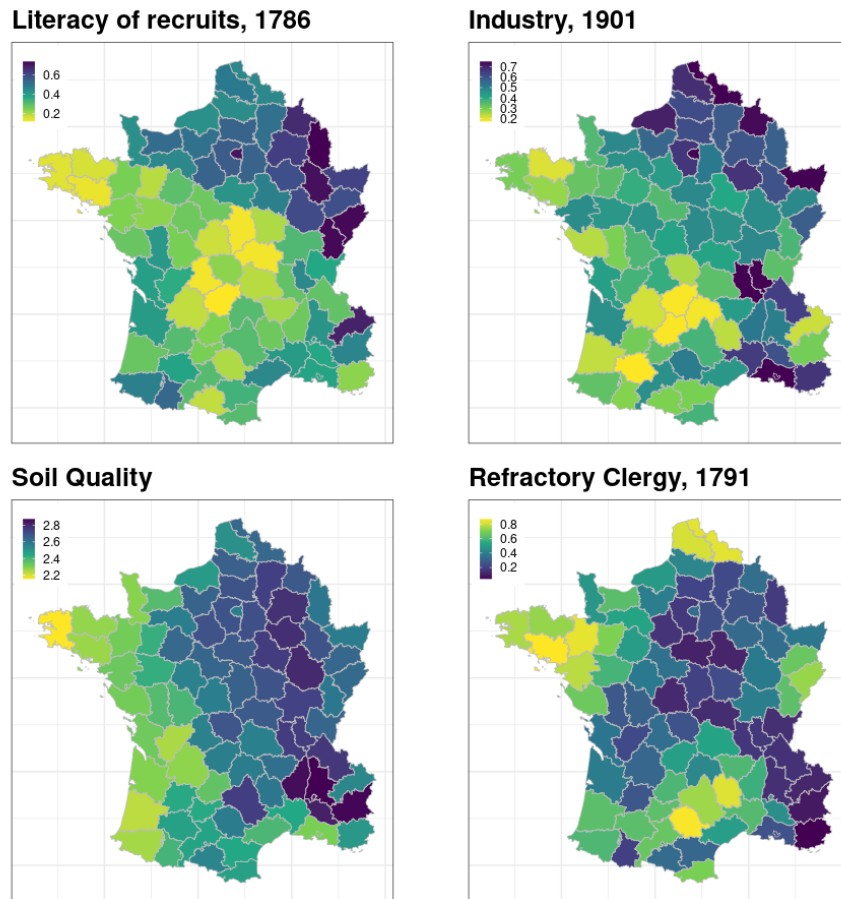
Figure 1: Refractory clergy were concentrated in areas with poor soil and are a proxy for low living standards. The prosperous northeast—where before the Revolution education was provided by the Catholic church rather than the municipalities who provided it elsewhere—had high literacy in 1788 and was highly industrialized in 1901.

this northern prosperity was joined to higher literacy through the Catholic church which provided education subsidized by its income from tithes. In the south, by contrast, education tended to be funded by, usually impoverished, municipalities and was expensive and of low quality (Montalbo, 2021).

This pattern persisted after the Revolution where more prosperous northern areas enjoyed high literacy and able to charge low fees, with the opposite in the

impoverished south. For the ten most literate départements around 1830 Angeville (1836, 71–73) reports that only 19 per cent of conscripts were illiterate and the average monthly school fee was Fr 0.61; whereas in the worst ten, 77 per cent were illiterate and the average fee was Fr 1.56. At the same time Angeville estimated that many teachers would have been doing well to earn as much as road-menders. The quality of teachers was correspondingly low, with many working part-time in other occupations, and of questionable literacy or character: of the 15 teachers in the large town of Rouen in 1815, seven were ex-convicts (Weber, 1976, 303–315).

After 1833, municipalities had to provide a school for boys (but not for girls) but because the central government provided no funding the quality in many places was low. In these circumstances, Catholic teaching orders with large numbers of nuns and brothers willing to teach at subsistence wages, and buildings funded by pious donations were for a long time the only solution available. These teaching orders spanned a wide spectrum of quality, from the Frères des Ecoles Chrétiennes operating large schools staffed by high quality teachers to congregations sending barely literate brothers and nuns to remote villages (Curtis, 1999).

Each département was supposed to establish a college to train primary school teachers but their annual output was low at first, allowing graduates to take their pick among affluent urban schools without needing to consider poor or remote ones. As a result, across much of France until the 1880s—when the government began to fund universal education with trained teachers and adequately equipped schools—the choice was often between congregational schools or none at all.

Turning to its wider economy, a defining feature of France until the late nineteenth century was its poor internal communications. Certainly, maps show a comprehensive network of primary roads, and later railway lines, connecting large towns to Paris (but often not to their nearby neighbours). The real difficulty however was the almost entire absence across large areas of southern France of local roads and branch lines connecting villages to these main routes. As a consequence, until the 1880s a considerable portion of the French population lived in virtual economic autarky, buying little from the outside except salt and iron, with limited use of money. An official report in 1863 estimated that half of schoolchildren could

not write in French and about ten per cent could not understand it at all. Weber (1976, 67, 310–315) thinks these numbers optimistic, even before we include the large numbers of children in these remoter places who did not attend school.

Reading Squicciarini's discussions of the First versus Second Industrial Revolutions might give the impression that industry across France was a scaled down version of what might be found in Birmingham or Manchester. In fact over most of France production was on a handcraft scale for local markets, and artisans (usually in two person workshops) still outnumbered workers three to one in the 1860s (Weber, 1976, 221).

A decisive change began with the Freycinet plan of 1879. As part of an effort by the Third Republic to democratize France, which also included free education, local railways were expanded rapidly (from 20,000 kilometers in 1879 to 26,000 in 1882, reaching 65,000 by 1910) with similar improvements in local roads Weber (1976, 203–211). In twenty years all but the remotest parts of rural France underwent rapid changes in dress, diet, and language encapsulated in the title of Weber's classic study *Peasants into Frenchmen*.

The economic impact of France's sudden and belated market integration was that the south deindustrialized as small scale metalworking, pottery making, handweaving and similar activities collapsed under competition from northern factories. Instead of Squicciarini's description of industrialization being retarded by substandard Catholic education, the reality is that poorer areas, which happened to have more Catholic schools due to a lack of state ones, de-industrialized at the same time as industries in the north grew at their expense.

3   Confounding Devotion and Deprivation

As mentioned in the Introduction, a distinctive feature of France before 1900 is that most variables were strongly correlated geographically and match up reasonably closely with a soil map of the country. This can be seen in Figure 2 which plots refractory clergy, industrial employment in 1901, agricultural wages in 1852, and

French historical data are highly correlated and tend to follow soil quality.
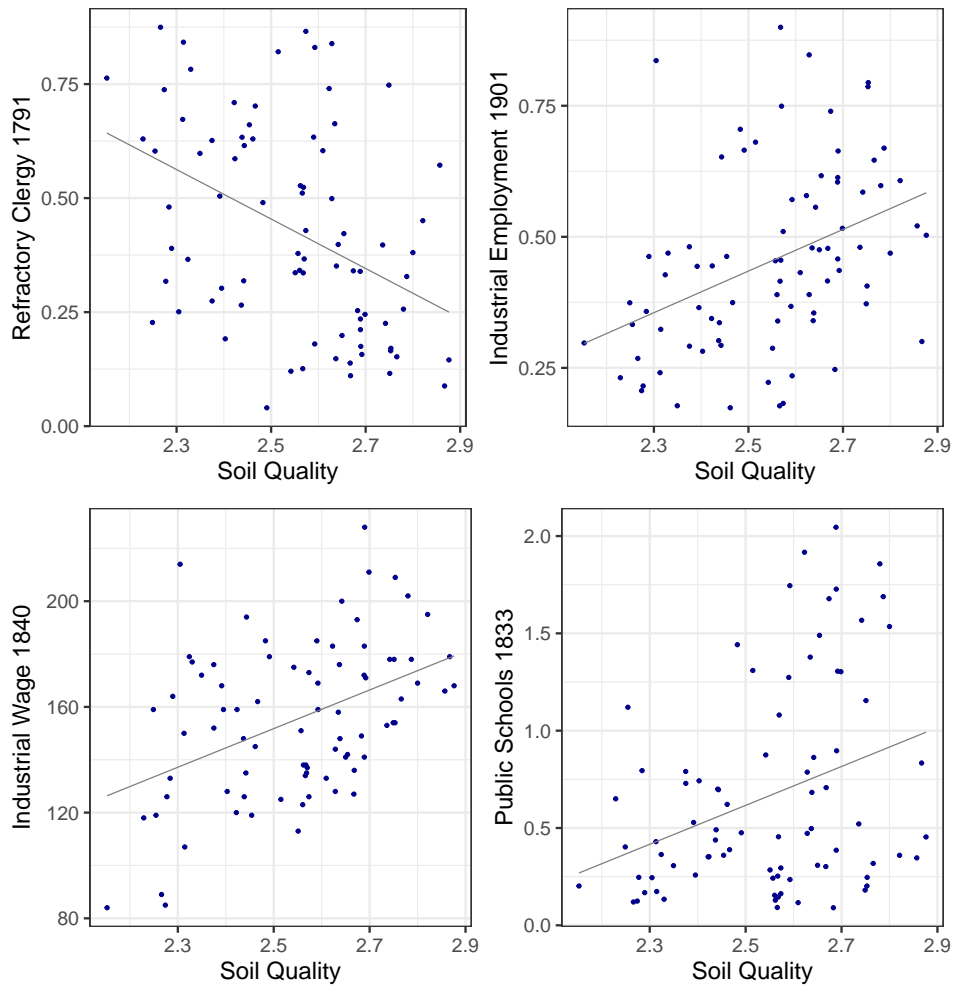Rich areas industrialized whereas poor ones were devout.

Figure 2: French historical data tend to be strongly correlated, and most outcomes can be predicted fairly accurately from soil quality. Rich places were industrialized whereas poor ones were devout, suggesting that the relationship between Catholicism and under-development may be confounded by living standards.

the target number of public schools in 1833 against soil quality.[3] These correlations

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[3]I use FAO predicted wheat yield, with low inputs and no irrigation to measure this. Squicciarini does include an alternative measure of wheat suitability as a control but the measure has a negative

suggest that any claimed connection between Catholicism and industrialization is at risk of being confounded by low living standards.

The regressions in Table 1 check this directly. Along with the variables in Table 3 of Squicciarini, I add a variety of living standard controls. The first is a simple dummy for the more prosperous north and east of France. Next are agricultural wages in 1852 from Squicciarini and Voigtländer (2015). Then there is soil quality, together with patents per capita in 1829; share of population that was urban, receipts from business taxes; and average number of doors and windows per house. This last variable, derived from the window tax, was the conventional measure of poverty at the time (Angeville reports it in the same table as his education data, as a measure of local ability to finance schools): in the early 1830s one third of dwellings had one window or none, and this had only fallen to one fifth in 1893 (Weber, 1976, 157).

Alongside these controls for living standards, I include distance to the nearest coalfield because coal was vital to late much nineteenth century industry (Fernihough and O'Rourke, 2021), and the dummy for northern and eastern (northwest, northeast, and southeast regions from Lavergne 1860) France where modern industry was disproportionately located. In these and following regressions, because some of its data are missing, Corsica is omitted. Reported standard errors are not corrected for spatial correlation: this does not affect the results materially.

The regressions display a consistent pattern. The impact of refractory clergy largely disappears when the dummy for the north and east is included, as it does with 1852 wages. Soil quality has a coefficient of 0.65, and wages, taxes, urbanization and patents have coefficients in the range 0.11 to 0.17. Distance to coal has a large coefficient except when soil quality is used as the control.

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correlation of −0.17 with recorded wheat yields from 1852 and no correlation with agricultural wages.

Table 1: Simple controls for confounding by living standards cause the connection between religiosity and industrialization to disappear. The 1852 wage is from Squicciarini and Voigtländer (2015).

	Industrial Employment 1901.								
	Original	North & East	Wage 1852	Wage 1852	Soil Quality	Business Tax 1836	Urban 1836	Windows 1831	Patents 1829
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Refractory	-0.209	-0.086	-0.072	-0.025	-0.010	0.021	-0.055	-0.033	0.016
	(0.060)	(0.053)	(0.061)	(0.049)	(0.047)	(0.041)	(0.039)	(0.046)	(0.052)
Control			0.368	0.170	0.653	0.123	0.124	0.126	0.142
			(0.068)	(0.068)	(0.225)	(0.025)	(0.022)	(0.050)	(0.045)
North and east		0.172		0.125	0.127	0.100	0.123	0.117	0.115
		(0.028)		(0.031)	(0.029)	(0.025)	(0.025)	(0.031)	(0.027)
Coal Distance				-1.359	-0.782	-1.574	-0.644	-1.699	-1.667
				(0.521)	(0.524)	(0.422)	(0.498)	(0.496)	(0.484)
R^2	0.543	0.702	0.685	0.767	0.770	0.806	0.801	0.751	0.780
Observations	80	80	78	78	80	80	80	80	80

Notes Refractory is share of refractory clergy, living standard is the control used in each column, coal is the (log) distance to the nearest coalfield, and North & East is a dummy for the northeast, northwest and southeast. The original controls for population, proto-industry, temperature, and precipitation are included. Wage 1852 is agricultural wage, soil quality is the FAO estimated yield for rain-fed wheat with low inputs. Urban is percentage urban population. Tax is business tax receipts; windows is average number of windows and doors per house; patents is the number of patents, all per capita. All controls are in logs. Robust standard errors in parentheses.

If the year of the dependent variable is changed from 1901 to 1896, 1906, or 1911 (the last is the end year chosen for the difference-in-differences and panel regressions in Tables 5 and 8 of Squicciarini) the coefficient on refractory clergy in all regressions is roughly halved compared with the figure for 1901 that is reported in the paper. The other measure of industrialization, machinery in 1891, is analyzed in Appendix 2. Again, religiosity has no explanatory power once similar basic controls are added.

3.1 Canton Level Analysis

The fact that data on refractory clergy are available for districts within départements alongside household consumption data allows a very powerful check of the proposed relationship between religiosity and development. Table 3 shows a regression on these two variables, including controls for population and dummies for each département for 1113 cantons within districts, and appears to show that the relationship is robust even at this fine level of analysis. The result, however, is an artefact of fitting outliers, which can immediately be seen by the fact that the effect sizes for population weighted regressions are about double those of the original ones.

High levels of consumption, however, are typically associated with larger towns, and these urban areas tended to have fewer refractory clergy. If we omit the 30 most populous districts (these have populations above 40,000) there the relationship disappears for the remaining 1083. It can also be seen that the population weighted results are effectively identical to the unweighted ones after removing these severe outliers.[4]

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[4]Although the regressions include fixed effects for départements, their reported standard errors are clustered at the level of districts. Clustering at département level causes standard errors to rise by around one sixth, giving a t statistic of 1.7 for the first regression despite over 1100 observations.

	Household consumption, 1901			
			Popn weighted	
	All Cantons	Ex 30 largest	All Cantons	Ex 30 largest
	(1)	(2)	(3)	(4)
Refractory	-0.047	-0.037	-0.080	-0.037
	(0.023)	(0.023)	(0.030)	(0.023)
Population	0.032	0.018	0.052	0.020
	(0.006)	(0.007)	(0.009)	(0.007)
Distance to Paris	-0.048	-0.048	-0.044	-0.046
	(0.023)	(0.022)	(0.034)	(0.025)
R^2	0.377	0.354	0.551	0.372
Observations	1113	1083	1113	1083

Consumption, 1894 population and distance to Paris are in logs. All regressions are at the level of cantons and include département fixed effects, while standard errors are clustered by district.

Table 3: The finding that refractory clergy affected household consumption in 1901 is driven by 30 out of 1113 cantons.

4 Alternative Measures of Religiosity

Although Squicciarini is concerned with the impact of religious devotion on economic development, the study rests on a single measure of devotion: the share of refractory clergy during the Revolution. A potential difficulty with this measure is that religion has often been a means of signalling political differences so that refusing to swear loyalty to the Revolution may have been as much a political act as a religious one. This question was addressed directly by Tackett (1982) who concluded that both motives were at work in 1791.

It is therefore useful as a test of robustness to see how the results change if we try other measures of religiosity, and several measures are available for the early nineteenth century. In his *Moral Statistics of France*, Guerry (1833) reports the number per capita of clergy for 1829, and of donations to the church for 1815–1824, both ranked by département.

	Industrial Employment 1901				
	Refractory Clergy	Donations/ Tax	Donations Rank	Clerical Students	Clergy Rank
Religiosity	-0.209	0.021	-0.001	0.000	0.000
	(0.062)	(0.013)	(0.001)	(0.035)	(0.001)
R^2	0.543	0.534	0.480	0.474	0.476
Observations	80	80	80	80	80

Notes Regressions include original controls for (log) population, mean temperature and precipitation, and pre-industrial activities. Robust standard errors in parentheses. Clerical Students is the fraction of army conscripts from this group, and Donations/Tax is the log of value of donations for the purpose of propagating the faith relative to total direct taxes paid. Clergy Rank is the number of priests, and Donation Rank is the number of donations to the church both relative to population and ranked by département. The Donations/Tax regression has a dummy for Ardennes département.

Table 4: Alternative measures of religiosity do not predict subsequent industrialization.

Similarly, Angeville (1836) reports the share of military conscripts in 1825–1829 who were clerical students; and the total value of donations to the church for the specific purpose of propagating the faith for 1827–1834. To control for the fact that these would be higher in richer places, Angeville measured the donations of each département relative to the total direct taxes it paid. By contrast with refractory clergy, these donations are not a simple correlate of poverty: donations are indeed high along the backward Atlantic coast, as are refractory clergy, but also in the prosperous, industrialized, and ultra-Catholic region around Lyon where clergy were notably docile during the Revolution.

Table 4 reproduces the original regressions of industrial employment in 1901 on religiosity and controls from the first column of Table 1, using both Angeville's and Guerry's measures of donations and clergy. It can be seen that none of these alternative measures of devotion has any ability to explain industrialization, al-

though as we will see in the next Section, Angeville's donation measure has very strong explanatory power for Catholic schooling.

5   Catholicism and Under-Education

What connects religious zeal with industrial underdevelopment? Squicciarini argues that the connection runs through education. The Catholic church set up its own primary schools in opposition to state schools and these schools provided an education that was deficient in technical training. The divergence started to become apparent in the 1860s "as parents began to fear that their Catholic identity was being threatened by the introduction of the secular, technical curriculum" (Squicciarini, 2020, 3456).

The traditional view, described by Curtis (1999), is that the growth of Catholic education reflected both demand and supply. On the demand side, until central government began to fund schools in the 1880s, religious orders provided a basic schooling that was not affordable, or even available, for most families in poorer places. Public schools, besides, were for boys only, creating a particular demand for girls schools run by nuns. On the other side, the ability of the church to fund these schools depended on the supply of contributions from suitably pious donors.

Figure 3 supports this explanation. The left panel, measuring demand, shows how the number of Catholic schools in 1901 is strongly predicted by a poor provision of public schools in the 1830s. On the supply side, the number of these schools is also strongly correlated with religious donations relative to wages.

Squicciarini (Table 6) finds that, consistent with the growing militancy of the Catholic church, the share of refractory clergy has no explanatory power for Catholic schools in 1851 and 1866 but strongly explains their growth between then and 1901. These findings are reproduced in the first columns of each set of regressions in Table 5. Explicit controls for demand and supply are added in the second column of each.

Table 5: Catholic schools were a response to demand (few public schools and low enrolment of girls) and supply (of donations), with refractory clergy having no explanatory power.

	Share of Catholic Schools.							
	1851		1866		1901		Growth 1866–1901	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Refractory	-0.004	-0.034	0.053	-0.014	0.122	0.038	0.318	0.038
	(0.047)	(0.037)	(0.050)	(0.045)	(0.041)	(0.033)	(0.113)	(0.083)
Public Schools 1833		-0.085		-0.121		-0.134		0.199
		(0.035)		(0.042)		(0.023)		(0.072)
Sex Imbalance 1837		-0.066		-0.088		-0.037		0.253
		(0.024)		(0.027)		(0.019)		(0.052)
Donations 1830		0.021		0.026		0.024		0.057
		(0.008)		(0.009)		(0.006)		(0.018)
R^2	0.172	0.645	0.321	0.629	0.379	0.695	0.248	0.735
Observations	81	81	81	81	81	81	81	81

Notes Public schools are the target number per capita dictated by the 1833 Guizot Law; sex imbalance is the ratio of boys to girls attending school in 1837; donations are for the propagation of the Catholic faith 1827–1834 relative to direct taxes paid. All control variables are in logs with robust standard errors in parentheses. Each regression contains the original controls. The regression for 1851 has dummies for St Etienne (many Catholic schools), Paris and Marseille, and that for 1861 also has a dummy for Seine-Inférieure (many Catholic schools). The growth regressions for 1866–1901 have dummies for Aveyron and Lozère (heavy donations) and Hautes-Pyrénées and Pyrénées-Orientales (low growth of Catholic schools).
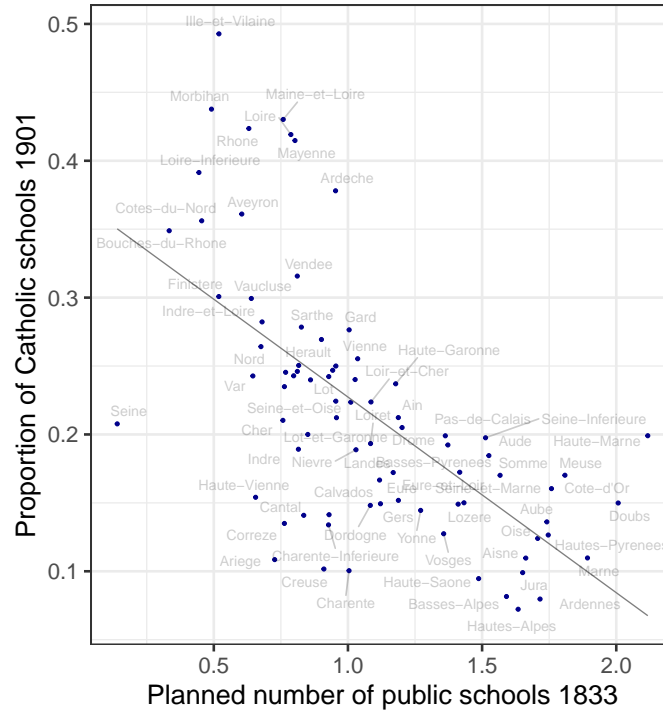
Figure 3: Catholic schools in 1901 versus the planned provision of public schools under the Guizot reforms of 1833.

The two measures of demand for the services of religious orders are the target number of public schools per capita under the Guizot reforms of 1833; and the ratio of boys to girls enrolled in school in 1837. This latter variable also measures poverty: only in relatively affluent areas did many girls go to school. On the supply side, I use donations for propagating the faith as a measure of piety.

It can be seen that these three demand and supply variables strongly predict the share of religious schools in each year, and their growth at the end of the late nineteenth century. As with industrialization, after adding new variables the explanatory power of the regressions jumps considerably while that of refractory clergy disappears: for instance, its coefficient in the final regression for growth after 1866 goes from 0.32 to 0.01.

	Industrial Employment 1861–1911					
	Refractory Clergy				Donations 1830	
	(1)	(2)	(3)	(4)	(5)	(6)
Religiosity	-0.045			-0.029	-0.008	-0.004
	(0.017)			(0.023)	(0.008)	(0.008)
Enrollment 1863		0.095		0.078		0.077
		(0.025)		(0.022)		(0.024)
Patents 1829			0.130	0.033		0.056
			(0.053)	(0.066)		(0.062)
R^2	0.111	0.146	0.127	0.160	0.086	0.142
Observations	810	810	810	810	810	810

Notes Religiosity is measured as the share of refractory clergy in columns 1–4; and as the log of donations for propagating the faith per capita in columns 5–6. Enrolment is the fraction of boys at school, and patents are the log of patents per capita. All variables are interacted with a post 1871 dummy. Département and year fixed effects are used and standard errors are clustered by département. Log population is included as a control.

Table 6: Difference-in-differences: Refractory clergy are again a proxy for backwardness.

6   Difference-in-Differences

In support of the argument that devotion hindered industrialization after 1871, Squicciarini runs a difference in differences regression of industrial employment at five year intervals from 1866 to 1911, where refractory clergy are interacted with a post-1871 dummy. The motivation is that the negative influence of Catholic education only began to be felt as more skilled workers came to be needed in new industry.

Given our earlier results the expectation is that these refractory clergy may again acting as a proxy for deprivation. To test this we add two other controls that we might expect to affect post-1871 industrialization: patents per capita in

1829 and the percentage of boys who were enrolled in school in 1863, both interacted with the post-1871 dummy. Religiosity is measured either by refractory clergy or by donations relative to tax around 1830 which, we have seen, is a far stronger predictor of Catholic schooling.

It can be seen that both patents and, especially, enrolment have strong explanatory power for post-1871 industrialization. When these are combined with refractory clergy, school enrolment retains a large coefficient: patents and refractory clergy highly collinear as Table 1 showed. If we use donations as the measure of religiosity, there is no connection with industrialization, even before controlling for development.

7 Longitudinal Results

Table 8 of Squicciarini finds that Catholic education retards industrial employment ten years later using a panel running from 1871 to 1911. This result is reproduced in the first two columns of Table 7 both for the share of Catholic students, and of Catholic schools.[5] The next two columns of Table 7 show the same regression results when the focus is on the north and east (the northwest, northeast, and southeast in Lavergne's 1860 classification): the modernizing regions of the French economy. These show no indication of any effect of Catholic education. The final columns are for all of France except the western region (in other words, adding the southwest and centre), which was de-industrializing in this period under competition from modern manufacturing, and show substantially reduced effect sizes from the first columns where that region is included.

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[5]The most important omitted variables in these regressions are likely to be road and railway links: as we saw above, these grew at an extremely rapid rate after 1880 under the Freycinet plan, particularly in poorer areas, butthese are not considered here.

	Industrial Employment 1861–1911					
	All Regions		North & East		Ex. West	
	Schools	Students	Schools	Students	Schools	Students
	(1)	(2)	(3)	(4)	(5)	(6)
Share Catholic	-0.196	-0.195	0.058	-0.064	-0.121	-0.136
	(0.068)	(0.063)	(0.109)	(0.084)	(0.073)	(0.066)
Population	0.256	0.236	0.229	0.248	0.261	0.245
	(0.084)	(0.077)	(0.101)	(0.108)	(0.081)	(0.077)
Enrollment rate	0.023	0.004	0.086	0.082	0.037	0.019
	(0.042)	(0.041)	(0.076)	(0.080)	(0.049)	(0.051)
Total schools	-0.067	-0.054	0.001	-0.024	-0.053	-0.049
	(0.049)	(0.045)	(0.105)	(0.104)	(0.054)	(0.055)
Students per school	-0.085	-0.087	-0.116	-0.125	-0.104	-0.103
	(0.031)	(0.030)	(0.062)	(0.069)	(0.034)	(0.035)
R^2	0.166	0.190	0.154	0.167	0.160	0.173
Observations	729	648	360	320	603	536

Panel regressions of industrial employment on the share of Catholic students and schools, plus other controls from the original regressions, ten years earlier. The first two columns give the original regressions; the second pair are for the northwest, northeast, and southeast; and the last pair are for all regions (adding the southwest, and centre) except the west.

Table 7: The apparent effect of Catholic schooling on development is driven by the backward and de-industrializing west.

8   Conclusions

Because the richest regions of France were the ones that industrialized, whereas the poorest ones were the most devout, any claimed causal relationship between religiosity and economic development may be confounded by living standards. Once simple controls for living standards were added—such as a dummy for northern and eastern France, a measure of soil quality, 1852 wages, and several more—the impact of refractory clergy on 1901 industrial employment does not appear ro-

bust. Similarly, using different measures of religiosity, in particular donations to the Catholic church around 1830, also led the claimed connection to disappear. Although church schools were the supposed link between clerical militancy and under-development, we found instead that the data are more consistent with traditional views that, to a considerable degree, Catholic religious orders established schools in response to a lack of affordable public education.

References

Angeville, Adolph d'. 1836. *Essai sur la statistique de la population française*. Paris: F. Darfour.

Brejon de Lavergnée, Matthieu. 2017. "Congrégations féminines et «éducation populaire»: l'exemple des sœurs de Saint-Vincent-de-Paul avant les lois Ferry." *Revue d'histoire du XIXe siecle* 55:93–107.

Curtis, Sarah A. 1999. "Supply and Demand: Religious Schooling in Nineteenth-Century France." *History of Education Quarterly* 39:51–72.

de la Croix, David and Faustine Perrin. 2018. "How Far Can Economic Incentives Explain the French Fertility and Education Transition?" *European Economic Review* 108:221–245.

Fernihough, Alan and Kevin Hjortshøj O'Rourke. 2021. "Coal and the European Industrial Revolution." *Economic Journal* 131:1135–1149.

Guerry, André-Michel. 1833. *Essai sur la statistique morale de la France*. Paris: Crochard.

Lavergne, M. Léonce de. 1860. *Economie rurale de la France depuis 1789*. Paris: Guillaume.

Montalbo, Adrien. 2021. "Schools without a Law: Primary Education in France from the Revolution to the Guizot Law." *Explorations in Economic History* 79(101364).

Squicciarini, Mara. 2020. "Devotion and Development: Religiosity, Education, and Economic Progress in Nineteenth-Century France." *American Economic Review* 110:3454–3491.

Squicciarini, Mara and Nico Voigtländer. 2015. "Human Capital and Industrialization: Evidence from the Age of Enlightenment." *Quarterly Journal of Economics* 30:1825–1883.

Tackett, Timothy. 1982. "The West of France in 1789: The Religious Factor in the Origins of the Counterrevolution." *Journal of Modern History* 54:715–745.

Weber, Eugen. 1976. *Peasants into Frenchmen: The Modernization of Rural France, 1870–1914.* Palo Alto: Stanford University Press.

Zhang, Nan and Melissa M. Lee. 2020. "Literacy and State-Society Interactions in Nineteenth-Century France." *American Journal of Political Science* 64:1001–1016.

Appendix A   Data Sources

Unless stated otherwise, all variables are taken from Squicciarini. Agricultural wages in 1852 are taken from Squicciarini and Voigtländer (2015).

Angeville (1836) is the source for ecclesiastical students 1825-29 as a share of recruits; value of donations to the church for propagating the faith, measured relative to total direct taxes paid for 1827–1834; average number of doors and windows per house in 1831; and patents per capita in 1829. The number of Catholic priests in 1829 and religious donations for 1815–1824 per capita, ranked by département, are from Guerry (1833). The regional classification is taken from Lavergne (1860)

The ratio of girls to boys in school in 1837 and the share of boys enrolled in school in 1863 are from de la Croix and Perrin (2018) and the planned number of schools in 1833 is from http://www.inrp.fr/she/guizot/annexes/tableau_07.htm.

Soil quality is FAO predicted wheat yield, rain-fed with low inputs http://www.fao.org/nr/gaez/en/. Each département is assigned the third quartile of the tiles that lie within it. Business tax receipts and urbanization in 1836 are taken from Zhang and Lee (2020).

Appendix B   Machinery 1891

Table A.1 repeats the regressions in Table 1, where the dependent variable is now machines per capita in 1891. It uses a subset of the previous living standard controls, along with proximity to coal and distance from Paris. Again, the claimed connection between religiosity and development is less than robust: adding coal and distance reduces the religious effect from -1.3 to -0.3, with living standard controls reducing it to around -0.1 for agricultural wages and patents. In keeping with the importance of steam power in the late nineteenth century, distance to coal has high explanatory power.

	(1)	(2)	Wage 1852 (3)	Soil Quality (4)	Patents 1829 (5)	Windows 1831 (6)
Refractory	-1.290	-0.303	-0.122	-0.240	-0.112	-0.272
	(0.271)	(0.247)	(0.254)	(0.257)	(0.253)	(0.233)
Control			0.406	2.118	0.608	0.614
			(0.453)	(1.338)	(0.260)	(0.258)
North and east		0.434	0.369	0.368	0.290	0.263
		(0.143)	(0.174)	(0.146)	(0.131)	(0.143)
Coal		-11.116	-10.568	-7.592	-9.423	-10.308
		(2.942)	(3.159)	(3.666)	(2.835)	(3.057)
Days from Paris		-0.152	-0.158	-0.130	-0.116	-0.132
		(0.034)	(0.034)	(0.041)	(0.033)	(0.035)
R^2	0.420	0.673	0.683	0.685	0.708	0.689
Observations	80	80	78	80	80	80

Column header: Machines per capita, 1891

Regressions include original controls for (log) population, mean temperature and precipitation, and pre-industrial activities. Robust standard errors in parentheses. All regressions after column 1 include a dummy for the heavy outlier of the Oise département. Control is the log of the living standard variable listed at the top of each column. Each regression after column 3 examines one potential confounder which are all described in Table 2. The soil regression contains a dummy for Marseille.

Table A.1: After controlling for living standards, coal and distance from Paris, religiosity has no explanatory power for the mechanization of industry.