

Religion and Work: Micro Evidence from Contemporary Germany*

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Abstract

Using micro data from contemporary Germany, this paper studies the connection between Protestantism and modern-day labor market outcomes. To address the endogeneity in self-declared religion, I exploit a provision in a sixteenth-century peace treaty, which determined the geographic distribution of Catholics and Protestants. Reduced form and instrumental variable estimates provide no evidence of an effect of Protestantism on hourly wages. However, relative to their Catholic counterparts, Protestants do appear to work longer hours. The patterns in the data are difficult to reconcile with explanations based on institutional factors or religious differences in human capital acquisition. Religious differences in individuals' values, however, can account for most of the estimated effects.

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I. Introduction

Throughout most of the history of the Western world, working hard was considered to be a curse rather than a virtue (Lipset 1992). Classical Greek and Roman societies regarded labor as degrading. Free men were to engage in the arts, trade, or warfare (Rose 1985). Medieval Christian scholars followed the ancient Hebrews in viewing work as God's punishment; and by condemning the accumulation of wealth for reasons other than charity, the Catholic Church went even beyond Greek and Roman contempt (Tilgher 1930, Rose 1985).

In *The Protestant Ethic and the Spirit of Capitalism*, Max Weber (1904/05) contended that Protestantism, in particular Calvinism, promoted a new attitude emphasizing diligence, thrift, and a person's calling. The Protestant Ethic, Weber famously argued, was the decisive factor in the emergence of capitalism.¹

There has been controversy about the impact of Protestantism ever since the publication of Weber's essays. Critics doubt his reading of Calvinist and Lutheran teachings and argue that the rise of capitalism occurred independently of the Reformation, or even spurred the latter (e.g., Sombart 1913, Brentano 1916, Tawney 1926, Samuelsson 1961). Yet the positive correlation between nations' wealth and Protestantism alluded to by Weber can still be found in recent data. To illustrate this point, Figure 1 plots GDP per capita against the share of Protestants for majoritarian Christian countries.

However, even ignoring institutional factors and other sources of omitted variables bias, the link between Protestantism and economic prosperity need not necessarily be causal. Economic theory predicts that more successful individuals, i.e. those with the highest opportunity cost of time, select "less costly" faiths, choose to participate less intensely, or opt out of religion altogether (Azzi and Ehrenberg 1975, Iannaccone 1992). As a consequence, simple correlations are unlikely to be informative about the economic impact of different religions.

Using micro data from contemporary Germany, this paper investigates the effect of Protestantism on work-related outcomes. In several ways, Germany is ideally suited for such an analysis. There exist only two major religious blocks, Catholics and Protestants.² Each comprises approximately one-third of the population, while nonreligious individuals account for about

¹ The exact content of Weber's claim is still disputed. It is uncontroversial, however, that Weber posited a difference between Catholic and Protestant, especially Calvinist, doctrines with a wide-reaching impact on economic outcomes.

² In contrast to the US, there are only a few Protestant denominations in Germany. Moreover, the Lutheran, Reformed, and United state churches are united in the *Evangelical Church in Germany*. Its member churches share full pulpit and altar fellowship, and individual members usually self-identify only as "Protestant."

twenty percent (Barrett et al. 2001).³ Moreover, the German population is relatively homogenous, and institutional differences within Germany are negligible compared to those in a cross-country setting.

As predicted by theory, I document in the data that economic success is an important determinant of whether someone selects out of religion. Not only are high income individuals substantially more likely to declare that they are nonreligious, but selection on economic success appears to be stronger among people who grew up in Protestant households than among those whose parents were Catholic. As a consequence, ordinary least squares estimates show almost no correlation between Protestantism and proxies of individuals' economic success, but are most likely downward biased.

To address the endogeneity in self-declared religion, I exploit the fact that the geographic distribution of Catholics and Protestants can be traced back to the Reformation period, in particular the Peace of Augsburg in 1555. Ending more than two decades of religious conflict, the peace treaty established the *ius reformandi*. According to the principle *cuius regio, eius religio* ("whose realm, his religion"), the religion of a territorial lord became the official religion in his state and, therefore, the religion of *all* the people living within its confines. While the Peace of Augsburg secured the unity of religion within individual states, it led to religious fragmentation of the German Lands as a whole, which at this time consisted of more than a thousand independent territories.⁴

Figure 2 depicts the religious situation as it developed after the Peace of Augsburg, and Figure 3 shows the geographic distribution of Catholics and Protestants within the boundaries of modern-day Germany. Evidently, the distribution today still resembles that at the beginning of the 17th century. This is also borne out in the data. Even today, individuals living in "historically Protestant" areas are considerably more likely to self-identify as Protestant than residents of "historically Catholic" regions.⁵

Although both sets of counties appear broadly similar in terms of observable aggregate characteristics, reduced form estimates reveal important micro-level differences. Compared with residents of historically Catholic regions, individuals living in historically Protestant areas work

³ The remainder is mainly, but not exclusively, accounted for by Muslims.

⁴ Not until the Peace of Westphalia in 1648 were subjects formally free to choose their own religion.

⁵ An important exception is Eastern Germany, where most people self-identify as nonreligious or atheist. To be conservative, I exclude East Germans from the analysis below. Reassuringly this sample restriction has virtually no impact on the qualitative results.

approximately one hour more per week and have slightly higher incomes. At the same time, they do not earn higher wages. Observable county characteristics cannot account for the observed differences.

To explore the impact of religion more rigorously, I use princes' religion in the aftermath of the Peace of Augsburg as an instrumental variable (IV) for whether individuals today self-identify as Protestant. For territories' official religion at the beginning of the 17th century to be a valid instrument for that of contemporary Germans living in the respective areas, it must be the case that princes' choices are uncorrelated with unobserved factors determining labor market outcomes almost 400 years later. This assumption is not directly testable.

The historical record, however, suggests that idiosyncratic factors and sixteenth-century politics, i.e., existing feuds and alliances, played an important role in rulers' decision of whether or not to convert to a Protestant faith (see, for instance, Lutz 1997, Dixon 2002, or Scribner and Dixon 2003).⁶ Cantoni (2012) and Rubin (2014) provide the only available quantitative evidence on rulers' choices and the spread of the Reformation. Cantoni (2012) finds that "latitude, contribution to the Reichsmatrikel [a proxy for military power], ecclesiastical status, and distance to Wittenberg [the origin of the Reformation movement] are the only economically and statistically significant predictors" of princes' decisions (p. 511).

In order to address concerns that these factors may affect labor market outcomes in present-day Germany, I pursue two complementary approaches. First, I present results from an IV strategy that uses rulers' *residualized* choices as an instrument, i.e., net of the effect of all factors that Cantoni (2012) and Rubin (2014) have shown to be correlated with the adoption of Protestantism. Identification in these specifications comes from what is arguably the idiosyncratic component of princes' decisions. Second, I use Bayesian methods developed by Conley et al. (2012) to probe the robustness of the main results with respect to general violations of the exclusion restriction.⁷

Taken at face value, the two-stage least squares point estimates suggest that Protestantism induces individuals to work three to four hours more per week. Again, there is no evidence to indicate that Protestantism affects wages. The result that Protestantism has a positive impact on

⁶ Interestingly, with successive rulers some states' official religion changed more than once. For instance, Calvinist princes often sent their offspring to Jesuit schools, which were of superior quality. Having been educated by devout Catholics, some of these children later reinstated Catholicism as the official religion in their state (Zeeden 1998).

⁷ In follow-up work, Spenkuch and Tillmann (2016) use essentially the same IV strategy to study the connection between religion and support for the Nazis in Weimar Germany.

hours worked is qualitatively robust across specifications as well as to the choice of instrument. Importantly, the Bayesian analysis shows that one would continue to obtain a positive point estimate if one is willing to rule out that princes' choices at the end of the sixteenth century exhibit a direct effect on contemporary hours worked of more than 2.5 hours per week. As long as one is willing to rule out a direct effect of about one hour per week, one would continue to reject the null hypothesis of no effect at conventional significance levels.

I argue that the patterns in the data are unlikely to be explained by institutional differences or a human capital theory of Protestantism, i.e. that Protestantism induces individuals to invest more in education (Becker and Wößmann 2009). If the causal effect of Protestantism operated through human capital acquisition, then one would expect denominational differences in wages. This does not appear to be the case.

By contrast, the evidence is consistent with a values-based explanation. Ancillary results suggest that Protestants are not only more likely to be self-employed, but that they choose jobs with a contractual obligation to work longer hours. Furthermore, controlling for how long individuals would ideally want to work (taking into account that their income would change) reduces the estimated impact of Protestantism by almost three-quarters and renders any remaining denominational differences statistically indistinguishable from zero.

An important limitation of the instrumental variables strategy in this paper is that the instrument is only defined at the county level. As a consequence, the two-stage least squares point estimates do not only pick up any individual-level impact of Protestantism but also spillover and peer effects, i.e., effects from interacting with other Protestants rather than Catholics. While the IV results still indicate an “effect of religion” (provided that the exclusion restriction required for a valid instrument is satisfied), the individual-level impact of Protestantism is likely smaller than suggested by the IV results. If one believes that peers effects are quantitatively important, then the more appropriate counterfactual would be a change in the religion of *all* of a county's residents rather than only the religion of a particular individual. Although peer and spillover effects do not feature prominently in Weber's *Protestant Ethic*, such a counterfactual is nonetheless interesting because it speaks to the economic impact of a society's predominant religion and values.

The analysis in this paper contributes to a large literature investigating the link between religion and economic outcomes (see Iannaccone 1998 or Lehrer 2009 for reviews).⁸ Despite the size of this literature questions of causality have often remained unanswered.

A key exception is the work of Gruber and Hungerman (2008), who demonstrate that declines in religious participation caused by increased secular competition lead to increases in drinking and drug usage.⁹ Hungerman (2014a) develops a theory-driven test for the effect of religious proscriptions on charitable donations and drinking. Intimately related to the findings in this paper are the results in Guiso et al. (2003) and Arruñada (2010), according to which Christian religions are closely associated with attitudes conducive to economic growth.

The closest two papers to the present one are Cantoni (2015) and Becker and Wößmann (2009), both of which use aggregate historical data to test Weber's theory. While Cantoni (2015) finds no evidence for an effect of Protestantism on economic growth, Becker and Wößmann (2009) show that Protestantism was associated with greater affluence in late-nineteenth-century Prussia. They argue, however, that the effect of Protestantism operated through the acquisition of human capital, i.e. literacy, and that there is little to no room for a Protestant work ethic.

Becker and Wößmann (2009) also correlate Protestantism with labor income in present-day Germany.¹⁰ They do not explore whether higher earnings of Protestants are due to an increase in wages, as predicted by their human capital theory, or to longer working hours. Given that contemporary differences in income seem to be due to the latter rather than the former, I argue that the present-day data are more compatible with a values-based explanation.

II. A Simple Model of Religion, Selection, and Work

To fix ideas and frame the empirical work to follow, this section provides a simple model formalizing Weber's (1904/1905) *Protestant Ethic* as reducing the utility of non-work-related

⁸ There also exist large literatures on the economic determinants of religion (see, e.g., Hungerman 2014b on the impact of education on religiosity) as well as on religious market structure and competition (see, for instance, Ekelund et al. 2006, Barro and McCleary 2005, 2006, Finke and Stark 2005, and the studies cited in Iannaccone 1998). For evidence on the macro-economic impact of religion, see Campante and Yanagizawa-Drot (2015).

⁹ In a similar vein, Gruber (2005) provides evidence that higher religious market density leads to higher levels of religious participation and improved outcomes, such as increased levels of education, income, and marital stability.

¹⁰ Since the instrument used in the historical part of their analysis (as well as by Cantoni 2015), i.e. distance to the city of Wittenberg where the Reformation movement originated, does not induce exogenous variation in the religious affiliation of Germans *today*, their "contemporary analysis of the association between Protestantism and earnings [...] stays purely descriptive" (Becker and Wößmann 2009, p. 578).

activities (or, alternatively, as reducing the “disutility from work”). In doing so, it borrows from Doepke and Zilibotti (2008).¹¹

Consider a population of two overlapping generations: parents and children. For simplicity, each parent is assumed to have exactly one child. Parents maximize their dynasty’s utility; i.e. they are altruistic towards their child, with $\beta \in (0,1)$ denoting the degree of altruism. To improve their offspring’s expected well-being parents invest in the human capital of their children, h , incurring a cost of $f(h)$. f is strictly increasing, convex, and twice continuously differentiable, with $f(0) = 0$. Alternatively, parents can choose to spend their full income w on consumption, c , or engage in leisure, l , both of which are normal goods. Utility is assumed to be additively separable in consumption, $u(c)$, and nonmarket activities, $v(l, s)$. $\delta \in (0,1)$ denotes a dynasty’s “taste for nonmarket activities” relative to consumption, and s denotes the fraction of time spent in church. Agents who do not spend any time in church, i.e. for whom $s^* = 0$, are said to be nonreligious.

For simplicity, the marginal utility of church-related activities is assumed to be independent of the amount of leisure time spent outside of church. That is, $\frac{\partial^2 v}{\partial l \partial s} = 0$. Children inherit δ from their parents. Both u and v are increasing, concave, and twice continuously differentiable in each of their arguments. Moreover, u and v satisfy Inada conditions with respect to c and l .

Assuming that children’s wages increase on average with their human capital, and letting $\mathbb{E}_{\tilde{w}|h}$ denote the expectation operator over a child’s wage conditional on human capital level h , a parent’s value function is given by

$$V(w) = \max_{c,h,l,s} (1 - \delta)u(c) + \delta v(l, s) + \beta \mathbb{E}_{\tilde{w}|h} [V(\tilde{w})],$$

subject to the budget constraint $c + f(h) = w(1 - l - s)$, where agents’ time endowments have been normalized to unity.¹²

By assuming that Protestantism reduces δ , i.e. dynasties’ taste for nonmarket activities (see Doepke and Zilibotti 2008 for a micro model justifying this assumption), the model above provides a very simple formalization of Weber’s (1904/05) hypothesis about the Protestant work ethic—although by no means the only one.

¹¹ Doepke and Zilibotti (2008) develop a model of preference formation with an endogenous taste for leisure. Their model can explain why the Industrial Revolution coincided with the rise of a new work ethic, and why the landowning aristocracy was replaced by capitalists rising from modest backgrounds.

¹² To guarantee existence of V , a child’s expected wage is assumed to be bounded for every level of human capital.

In the spirit of Azzi and Ehrenberg (1975) and Iannaccone (1992), the model also predicts systematic selection of out religion. To see this, consider the first order conditions:

$$(1) \quad (1 - \delta)u'(c) = \mu$$

$$(2) \quad \beta \frac{\partial}{\partial h} \mathbb{E}_{\tilde{w}|h}[V(\tilde{w})] = \mu f'(h)$$

$$(3) \quad \delta v_1(l, s) = w\mu$$

$$(4) \quad \delta v_2(l, s) \leq w\mu$$

where μ denotes the usual Lagrange multiplier, i.e. the marginal utility of income, and equation (4) recognizes that a corner solution might obtain with respect to time spent in church. That is, a strict inequality in (4) implies that $s^* = 0$.

It follows from (3) that by reducing δ , Protestantism induces individuals to engage in less leisure, i.e. it decreases l^* for any w . The same holds true (at interior solutions) for s^* , as is apparent from (4). The decrease in nonmarket time increases hours worked and, therefore, raises earnings (as well as consumption).

The effect of religion on human capital investments, however, is theoretically indeterminate. It is straightforward to show that even for “well-behaved” distributions of wages, the sign of $\frac{d}{d\delta} \left(\frac{\partial}{\partial h} \mathbb{E}_{\tilde{w}|h}[V(\tilde{w})] \right)$ can be either positive or negative, as it will also depend on the levels of u and v . Therefore, for (2) to continue to hold, $\mu f'(h)$ may need to decrease or increase in response to a change in δ . This makes Protestantism’s impact on human capital or education ambiguous.

With regard to selection, the model predicts that individuals with less of a taste for nonmarket activities, i.e. Protestants, are more likely to opt out of church completely. This follows from the inequality in equation (4) being more likely to hold for lower values of δ . For any given level of investment in children’s human capital, h , it takes a lower wage draw for the children of Protestants for the inequality in equation (4) to be strict.

Moreover, if the marginal utility of income does not decrease “too fast,” i.e. if $w\mu$ is increasing in w , then economically more successful individuals, i.e. those with higher wages, will opt out of religion more frequently than less successful agents.¹³

¹³ The assumption that $w\mu$ increases in w is equivalent to assuming that leisure, l , decreases as wages increase, i.e. that the substitution effect outweighs the income effect.

Thus, guided by this simple formalization of Weber's theory, one would predict that selection is more severe among children of Protestant parents and that it mutes observed differences in economic outcomes between self-identified Protestants and self-identified Catholics.

It is important to point out that the model above shuts down individuals' choice between Catholicism and Protestantism. That is, the model lets agents select out of religion, but it (implicitly) assumes that children who choose to participate in church-related activities will be of the same faith as their parents. Whether this assumption is realistic is ultimately an empirical question. In the context of contemporary Germany, it appears to hold up well (cf. Table 1).

III. Data Sources and Summary Statistics

The primary data set used in this paper is the restricted-use version of the German Socio-Economic Panel Study (SOEP), which I supplement with information on counties' institutional features and infrastructure, such as number of schools and colleges, sectoral composition of the workforce, number of firms, etc. The latter data come from *Statistik regional 2007*, an annual publication of the German Federal Statistical Office and the statistical offices of the Länder.

The SOEP is a representative longitudinal data set of private households in Germany.¹⁴ Starting in 1984 with 5,921 households containing 12,245 individuals living in the Federal Republic of Germany, the SOEP has collected data on a wide range of subjects in every year thereafter. Covered topics include household composition, employment status, occupational and family biographies, time allocation, personality traits, as well as physical and mental health, among others.¹⁵

Since there is little variation in religious affiliation over time (and the existing variation is likely endogenous), theoretical gains from exploiting the full panel structure of the data are limited. Hence, the analysis in this paper uses cross-sectional information contained in the 2000–2008 waves. To minimize the effect of measurement error, the available information on time varying outcome variables, such as income, wages, or hours worked, has been combined by taking means. Econometrically, this is useful because it reduces noise in the outcome variable

¹⁴ The restricted-use version differs from the public-use one in that it contains sensitive regional information, such as county identifiers, and that the data files containing sensitive information can only be accessed remotely or on-site in Berlin. Researchers who are interested in using either version may apply to the DIW Berlin for access.

¹⁵ After 15 (25) years, approximately 50% (25%) of the original sample still participated in the SOEP. Panel attrition is overwhelmingly due to refusal to reply.

and thus increases the precision of the point estimates. Economically, it amounts to approximating more desirable measures such as permanent income.

As the communist history of East Germany constitutes a potential confounding factor (given its implications not only for religion but also for economic outcomes), the empirical work in this paper focuses on West Germans who were between 25 and 65 years old in 2003. Furthermore, I restrict attention to self-identified Catholics, Protestants, and nonreligious respondents for a final sample of 9,286 observations.¹⁶ The Data Appendix contains additional information on the sample selection procedures and names the exact source of each variable used throughout the paper.

Summary statistics by religion are presented in Table 1. Demographic differences between Protestants and Catholics are quite small; and in terms of economic success, Protestants do not fare much better than Catholics.¹⁷ By contrast, nonreligious individuals are much more likely to be male, rear fewer children, and divorce more frequently. They are also more likely to live in urban environments. Most importantly, the nonreligious are more educated and display considerably better economic outcomes than either Catholics or Protestants.

As the bottom rows of Table 1 demonstrate, there is a strong intergenerational correlation of religion. Interestingly, the nonreligious are substantially more likely to have been raised by Protestant than by Catholic parents. One explanation for the latter pattern is selection out of religion based on economic success. That is, high income individuals may be more likely to grow up in Protestant environments but choose to affiliate with no religious group as adults. If correct, then selection out of religion would mute economic differences between self-identified Protestants and self-identified Catholics.

IV. Do High-Income Individuals Select out of Religion?

Another reason one may expect economically successful individuals to leave the church is that, in Germany, members of religious congregations are obliged to pay a Church tax (*Kirchensteuer*)

¹⁶ The SOEP asks, “Do you belong to a church or religious community? If so, are you ...?” The set of possible answers is: “Catholic”, “Evangelical” (i.e. Protestant), “member of another Christian community,” “member of another religious community,” “No, nondenominational.” For simplicity, this paper uses the term “nonreligious” for all individuals checking the last category.

¹⁷ Raw differences between Protestants and Catholics are somewhat larger in earlier waves of the SOEP, as shown in Becker and Wößmann’s (2009) addendum.

of up to 4% of all taxable income. Yet, the question of whether well-to-do individuals are actually more likely to select out of religion is ultimately an empirical one.

In Table 2, I study the issue of selection by regressing an indicator variable for whether a respondent in the SOEP self-identifies as nonreligious on hourly wages and a host of observable individual- and county-level characteristics.¹⁸ The first three columns show results for the entire sample. In columns (4)–(6) and (7)–(9), I restrict attention to individuals whose parents were either both Protestant or both Catholic.

Several findings emerge from this analysis. First, respondents who grew up in Protestant households are, on average, nearly twice as likely to select out of religion than those who grew up in Catholic family environments. Second, as predicted by simple economic reasoning, high-wage individuals, i.e. people with a higher opportunity cost of time, are substantially more likely to opt out than their poorer counterparts. Third, selection on economic success is, if anything, stronger among the offspring of Protestant parents. Comparing the coefficients on hourly wages in columns (8) and (12), for instance, yields a difference of .051, which is statistically significant at the 10%-level ($p=.083$).

To appreciate the consequences of selection on economic success, consider a naïve OLS regression of some economic outcome of interest, y_i , on a set of religious identifiers and controls, as in the following linear model:

$$(5) \quad y_i = \beta_P \text{PROTESTANT}_i + \beta_{NR} \text{NONRELIGIOUS}_i + \mathbf{X}'_i \boldsymbol{\gamma} + \mathbf{Q}'_c \boldsymbol{\lambda} + \mu_s + \varepsilon_i,$$

where Catholic is the omitted category, and \mathbf{X}_i and \mathbf{Q}_c denote vectors of individual- and county-level covariates, respectively. μ_s marks a state fixed effect, and the error term is given by ε_i .

By the Frisch-Waugh Theorem, the probability limit of the OLS estimate of β_P is given by

$$(6) \quad \text{plim } \hat{\beta}_P = \beta_P + \text{Cov}(\text{PROTESTANT}_i^*, \varepsilon_i) / \text{Var}(\text{PROTESTANT}_i^*),$$

where PROTESTANT_i^* denotes the residual from projecting PROTESTANT_i on the remaining covariates. Thus, least squares produces an unbiased estimate of β_P , the causal effect of Protestantism on y_i , if and only if $\text{Cov}(\text{PROTESTANT}_i^*, \varepsilon_i) = 0$.

¹⁸ Appendix Table A.1 replicates the analysis in Table 2 using labor income instead of wages to proxy for economic success.

This condition is unlikely to hold. Given the selection patterns that I document in Table 2, the covariance between $PROTESTANT_i$ and ε_i is most likely negative. This is because “latent Protestants” with high values ε_i are economically more successful and, therefore, more likely to self-identify as nonreligious—even more so than those who grew up “Catholic.” Thus, unless the included covariates perfectly account for selection between and out of different religions, the second term in equation (6) will be negative, which leads to downward bias in simple OLS estimates of β_P .

As is well known from other contexts, the extent of the bias need not decline with the inclusion of additional controls (cf. Grilliches 1979). Specifically, including control variables that explain variation in $PROTESTANT_i$ but fail to reduce $Cov(PROTESTANT_i^*, \varepsilon_i)$ by much, may actually increase the second summand in equation (6) and, therefore, the bias in $\hat{\beta}_P$.

V. Partial Correlations

Although the analysis above suggests that there is little to be learned from simple comparisons of outcomes between self-identified Protestants and self-identified Catholics it is nonetheless useful to start by doing exactly that, if only to establish a lower bound on β_P , the causal effect of Protestantism (relative to Catholicism).

To this end, I restrict attention to individuals who identify as Catholic or Protestant, and estimate variants of equation (5). My baseline regressions use a parsimonious set of covariates, including only individuals’ gender, age, and distance to the nearest city, which proxies for economic conditions related to urban environments. To be as nonparametric as possible, age and distance to the nearest city are each divided into multiple categories and included in the regressions as indicator variables. Yet regional characteristics beyond the control of the individual are also likely to influence outcomes. To account for these factors, the vector \mathbf{Q}_c includes all county characteristics shown in Table 4 below.

Table 3 presents the results from this exercise. The dependent variable in columns (1)–(4) is weekly hours of work, while that in columns (5)–(8) is the natural logarithm of hourly wages. The logarithm of monthly earnings serves as the dependent variable in columns (9)–(12). The vector of included covariates varies across columns. Moving from left to right within each group of regressions, the set of controls steadily grows.

For all three outcomes, the same picture as in the raw data emerges. Protestants and Catholics fare quite similarly. Although the former work slightly longer hours, large standard errors make any conclusions prohibitively speculative.

Given that economic theory predicts individuals with higher opportunity cost of time to choose “less costly” forms of religion or to opt out of religion altogether (e.g., Azzi and Ehrenberg 1975, Iannaccone 1992), and considering the selection patterns in the SOEP data, the OLS estimates in Table 3 are best viewed as lower bounds on the causal impact of Protestantism. Estimating the true effect of religion requires exogenous variation in individuals’ affiliation.

To address the endogeneity in self-declared religion, I exploit the fact that the geographic distribution of Catholics and Protestants can be traced back to a peace treaty in the sixteenth century. Based on this historical event, I construct a variable, Z_c , with which I instrument for $PROTESTANT_i$. For Z_c to be a valid instrument it must be the case that (i) $Cov(PROTESTANT_i, Z_c) \neq 0$ and (ii) $Cov(Z_c, \varepsilon_i) = 0$. In words, the instrument must explain at least some of the residual variation in individuals’ self-declared religion *and* it must not be systematically correlated with any unobserved factors affecting the outcome of interest today. If both conditions are satisfied, then the causal effect of Protestantism, i.e., β_P , can be consistently estimated via two-stage least squares (2SLS).

As is generally the case with IV methods, the resulting point estimates should be interpreted as local average treatment effects. That is, the 2SLS coefficients will denote the causal impact of Protestantism on individuals who, for historical reasons, self-identify today as Protestants rather than Catholics. These are likely people who do not consciously select between different faiths or out of religion altogether.

VI. Germany's Religious Landscape and Its Historic Determinants

As Figure 3 demonstrates, the religious landscape in present-day Germany is far from homogenous. With the exception of East Germany, where atheists constitute the overwhelming majority (due to half a century of Communist rule), the population in most counties adheres predominantly to either Catholicism or Protestantism. This section briefly reviews the historic causes for this pattern and describes the construction of my instrumental variable.¹⁹

¹⁹ The following summary draws heavily on historical accounts by Lutz (1997), Dixon (2002), Scribner and Dixon (2003), as well as Nowak (1995).

At the beginning of the sixteenth century, the German Lands were fragmented into more than a thousand independent (secular and ecclesiastical) territories and free Imperial Cities. Although the Holy Roman Empire was formally governed by an emperor, political power within the Empire lay for the most part with its territorial lords.

Despite widespread discontent about matters of church organization and abuses of power by the clergy, the religious monopoly of the Roman Catholic Church remained essentially unchallenged until the “Luther affair” starting in 1517.²⁰ What those in power initially perceived as a dispute among clergymen quickly spread to the urban (and later rural) laity and became a mass movement. Notwithstanding Luther’s excommunication in 1521 and the Edict of Worms, in which Emperor Charles V outlawed Luther as well as the reading and the possession of Luther's writings, popular support for the Reformation remained strong until the Peasant War in 1525.

After the Diet of Speyer in 1526, the German princes assumed leadership of the Reformation movement. The Diet instituted that until a synod could settle the religious dispute, territorial lords were to proceed in matters of faith as they saw fit under the Word of God and the laws of the Empire. Princes who had privately converted to Lutheranism took this as an opportunity to proceed with church reform in their state. As a devout Catholic, Emperor Charles V, however, was determined to defend the (old) Church. Yet, his attempts to undo the Reformation and enforce the Edict of Worms led only to the Schmalkaldic War.

Ending more than two decades of religious conflict, the Peace of Augsburg in 1555 established the princes’ constitutional right to introduce the Lutheran faith in their state (*ius reformandi*). According to the principle *cuius regio, eius religio* (“whose realm, his religion”), the religion of a lord became the official faith in his territory and, therefore, the religion of *all* the people living within its confines.²¹ Only ecclesiastical rulers were not covered by the *ius reformandi* (*reservatum ecclesiasticum*). A (Catholic) bishop or archbishop would lose his office

²⁰ Martin Luther was by no means the first to voice discontent about the state of the Catholic Church. According to Dixon (2002, p. 18), “In the final decades of the fifteenth century the state of the Church had become a matter of great urgency.” Being deeply concerned about his own salvation and the spiritual welfare of parishioners, Luther’s initial intention was simply to alert the archbishop of Mainz to the abuse of the indulgence trade—not to cause a schism of the Church. However, Luther’s doctrine of salvation through faith alone (*sola fide*) “challenged the basis of the Church as it then was” (Scribner and Dixon 2003, p. 14), which made Luther a heretic in the eye of the papacy. Only after his excommunication in 1521 did Luther ultimately break with the Catholic Church.

²¹ In contrast to the Lutheran faith (*Confessio Augustana*), neither Calvinism nor Anabaptism was protected under the Peace of Augsburg. Nevertheless, a non-negligible number of territories underwent a Second Reformation, in which Calvinism became the official religion.

and the possessions tied to it upon conversion to another faith. Ordinary subjects refusing to convert were, conditional on selling all property, granted the right to emigrate (*ius emigrandi*). The overwhelming majority of subjects, however, were serfs who could not afford to pay for their own freedom.

Only about 10% of the population ever showed a lasting interest in the ideas of the Reformation, but as much as 80% adhered to a Protestant religion at the end of the sixteenth century (Scribner and Dixon 2003). Therefore, most conversions must have occurred involuntarily. There exists, indeed, ample evidence that the *ius reformandi* was often strictly enforced until the beginning of the seventeenth century.²² Even residents of Imperial Cities—although formally free—were frequently forced to adopt a particular faith. In these towns, political power lay in the hands of local elites who virtually imposed the Reformation (Dixon 2002).

Rulers' choices of religion depended on multiple factors. Most lords were deeply religious and not only concerned about their own salvation but also about that of their subjects (Dixon 2002). Moreover, political considerations, such as ties between noble families and the formation of alliances with or against the Catholic emperor, contributed to the decision (see, for instance, Lutz 1997). On one hand, any converted territory or Imperial City had to fear losing the Emperor's support or drawing hostility from neighboring states. On the other hand, rulers also stood to gain from introducing the Reformation, as it allowed them to take possession of church property as well as assert their independence.²³ The fact that territories' official religion often changed more than once, especially when a new generation of princes took reign toward the end of the sixteenth century, suggests that idiosyncratic factors also played an important role.²⁴

Cantoni (2012) and Rubin (2014) provide otherwise rare empirical evidence on rulers' choices and the spread of the Reformation. Cantoni (2012) reports that “latitude, contribution to the Reichsmatrikel [a proxy for military power], ecclesiastical status, and distance to Wittenberg [the origin of the Reformation movement] are the only economically and statistically significant predictors” of princes' decisions (p. 511). He rationalizes these findings through a theory of

²² For instance, “heretics,” i.e. those who did not adhere to the official state religion, faced the death penalty in the Duchy of Upper Saxony (Lutz 1997).

²³ Formally, a reformed lord was head of the Protestant church in his state. Of course, this did not apply to Catholic rulers, who nevertheless often behaved “like popes in their lands” (Dixon 2002, p. 117).

²⁴ Testing the *reservatum ecclesiasticum*, Archbishop Gebhard Truchseß von Waldburg, for instance, converted to the Lutheran faith in order to be allowed to marry a Protestant canoness. He thereby started the Cologne War (1582/83).

strategic neighborhood interactions, in which territorial lords followed the lead of their more powerful neighbors. Rubin (2014) shows that cities that had a printing press in 1500 were subsequently more likely to adopt Protestantism, presumably because printing facilitated the spread of information.

Historians refer to the period from the Peace of Augsburg to the Peace of Westphalia in 1648 as the Age of Confessionalization.²⁵ It is during this time and through the process of princely reformation that states developed religious identities and that the geographic distribution of Protestants and Catholics was determined (Eyck 1998).

Although individuals were formally free to choose their own faith after 1648, most territories of the Holy Roman Empire remained religiously uniform until the *Reichsdeputationshauptschluss* in 1803. This piece of legislation enacted the secularization of ecclesiastical territories and the mediatization of small secular principalities. That is, ecclesiastical territories, Imperial Cities, and other small entities were annexed by neighboring states, thereby reducing the number of independent territories from over a thousand to slightly more than thirty states and forty-eight Imperial Cities (Nowak 1995). Due to the *Reichsdeputationshauptschluss*, Protestants and Catholics have lived in religiously “mixed” states for at least two hundred years.

On a local level, however, most areas remained religiously homogenous until the mass migrations associated with World War II. In 1939, for instance, Protestants or Catholics respectively comprised more than 90% of the population in each of 247 counties.²⁶ By 1946 this number had dropped to 82 (Nowak 1995). Nevertheless, the geographic distribution of Catholics and Protestants today can still be traced back to the religion of the territorial lords during the Age of Confessionalization (cf. Figures 2 and 3).

To construct a mapping between present-day counties and the religion of the princes who reigned over the corresponding areas in the aftermath of the Peace of Augsburg, this paper relies on several historical accounts. In particular, the regional histories by Schindling and Ziegler

²⁵ Ending the Thirty Years’ War, the Peace of Westphalia (1648) also ended the princes’ right to determine the religion of their subjects (although the *ius reformandi* remained formally in place). A territory’s official Church was guaranteed the right to publicly celebrate Mass etc. (*exercitium publicum religionis*), but individuals were allowed to choose and privately practice another faith (*devotio domestica*). In contrast to the Peace of Augsburg, the Peace of Westphalia did not only protect the Catholic and Lutheran denominations, but also Calvinists. Regarding disputes, the peace treaty stipulated the “normal year” 1624. That is, territories should remain with the side that controlled them in January 1624.

²⁶ At this time, the Third Reich consisted of almost 900 counties.

(1992a, 1992b, 1993a, 1993b, 1995, 1996) contain the most detailed available information on the territories of the Holy Roman Empire for the period from 1500 to 1650.

The assignment created with this information is based on the religious situation around 1624—the “normal year” set in the Peace of Westphalia.²⁷ Although there existed notable differences between and within different reformed faiths, as a whole the teachings of Lutherans, Calvinists, and Zwinglians were much closer to each other than to the doctrines of the Catholic Church (Dixon 2002). Moreover, most Protestant denominations today are united in the *Evangelical Church in Germany*.²⁸ Therefore, the assignment abstracts from differences between reformed denominations and differentiates only between Protestant and Catholic territories.

I define a county as “historically Protestant” when the prince who ruled over the respective area chose to convert to a Protestant faith. Whenever Catholic and Protestant princes reigned over different parts of a county’s area, or whenever that area encompassed an Imperial City or an ecclesiastical territory, I classify the county as “historically Protestant” if and only if the likely majority of subjects was Protestant. Since population estimates for the period are often not available, relative populations are gauged by comparing the size of the areas in question (assuming equal densities).²⁹

Table 4 displays descriptive statistics for observable county characteristics today. While “historically Catholic” counties are somewhat larger and more densely settled, the difference in means is statistically distinguishable from zero in only one out of eleven cases.³⁰ Based on this evidence, it appears that “historically Protestant” and “historically Catholic” counties are broadly comparable. Importantly, there is little evidence to suggest that the former areas fare systematically better than the latter ones.

²⁷ Since territories’ official religion was not constant in the aftermath of the Peace of Augsburg, there exists the possibility that the results depend on the choice of base year. To rule this out, a second mapping based on the situation directly after the Peace of Augsburg in 1555 has been created. Both mappings are fairly similar, but the situation in 1624 is a slightly better predictor of the geographic distribution of Protestants and Catholics today.

²⁸ The German use of the term “evangelical” (*evangelisch*) is very different from that in English. In particular, it does not share the connotation of a “high regard for biblical authority,” but simply refers to the Protestant faith in general.

²⁹ In a previous version of this paper, I experimented with a finer classification system, which allowed for “historically mixed” counties. Since “historically mixed” turns out to be a weak instrumental variable, and since the results are qualitatively robust to dropping observations in “historically mixed” counties, I proceed with the coarser classification above.

³⁰ Even controlling for whether a county is located within the area of the former German Democratic Republic (GDR), differences in means are statistically distinguishable from zero in only one case.

VII. Estimating the Impact of Protestantism

A. Reduced Form Relationships

The historical review suggests that the peculiar determinants of the geographic distribution of Catholics and Protestants may constitute a source of plausibly exogenous variation in the religious affiliation of Germans today. If the exclusion restriction required for a valid instrument does, indeed, hold, then the two-stage least squares estimates below will identify the local average treatment effect of Protestantism (relative to Catholicism).

First, however, Table 5 verifies that the princely reformation in the aftermath of the Peace of Augsburg introduces variation in the religion of contemporary Germans. The estimates in the upper panel correspond to α_p in the linear model:

$$(7) \quad \text{PROTESTANT}_i = \alpha_p \text{HISTORICALLY PROTESTANT}_c + \mathbf{X}'_i \boldsymbol{\theta} + \mathbf{Q}'_c \boldsymbol{\zeta} + \iota_s + v_i,$$

where $\text{HISTORICALLY PROTESTANT}_c$ is an indicator variable for the religion of counties' ruler, as explained above.

The evidence demonstrates that individuals living in historically Protestant counties are at least 25 percentage points more likely to self-identify as Protestant than those living in the remaining areas. The results in the lower panel are based on the same specification as those in the upper one, but use princes' *residualized* instead of their actual choice of religion as the key independent variable. That is, in the lower panel, $\text{HISTORICALLY PROTESTANT}_c$ corresponds to the residual from regressing rulers' religion at the end of the sixteenth century on all factors that Cantoni (2012) and Rubin (2014) have shown to be predictive of their choices. Focusing on the residuals isolates the idiosyncratic component of princes' decisions. Reassuringly, the first stage estimates are quite similar.

As princes' choices of whether or not to remain Catholic introduce variation in the religion of Germans today, one would also expect princes' religion to be correlated with individual-level economic outcomes if Protestantism were to have a causal effect. Table 6 explores this issue by estimating the reduced form relationship:

$$(8) \quad y_i = \varphi_p \text{HISTORICALLY PROTESTANT}_c + \mathbf{X}'_i \boldsymbol{\theta} + \mathbf{Q}'_c \boldsymbol{\psi} + \tau_s + \eta_i,$$

where all variables are defined as above.

According to the reduced form point estimates, individuals living in historically Protestant counties work about 1 hour more per week, and have about 4% higher earnings than their counterparts in historically Catholic areas. While only the former effect is consistently statistically significant, both sets of point estimates are economically meaningful. By contrast, as shown in the columns in the middle of the table, wages in historically Protestant counties are statistically indistinguishable from those in Catholic regions.

One possible explanation for these findings is that historically Protestant territories differ systematically from historically Catholic ones. For instance, the former might have developed different institutions, or invested in infrastructure particularly conducive to economic success. In such a case, the reduced form estimates might simply reflect such differences.

The explanatory power of this argument, however, is a priori limited. At least since the creation of a unified German Empire in 1871, but more likely since the *Reichsdeputationshauptschluss* in 1803, formal and informal institutions have converged between traditionally Protestant and Catholic areas. Today formal institutions, such as the legal or tax system, are virtually identical across counties. Only the educational system exhibits some variation at the state level. To the extent that observable county characteristics proxy for existing differences in institutions or infrastructure, one would also expect the estimates to decline markedly with the inclusion of county-level controls. This is not the case.

Moreover, by controlling for state fixed effects, only within-state variation in outcomes and princes' choices of religion is being used to identify the coefficients in the even-numbered columns of Table 6. This removes any potential bias from unobservable institutions that vary only at the state level. While there does remain variation in princes' religion within today's states (cf. Figures 2 and 3), including state fixed effects comes at the cost of discarding much otherwise useful variation. Remarkably though, the point estimates change only slightly.

B. Instrumental Variables Estimates

The preceding discussion establishes a relationship between princes' religion around 1624 and the religion of contemporary Germans, as well as a correlation between princes' religion and economic outcomes today. Differences in observable county characteristics or unobservable institutions are unlikely to explain the patterns in the data. Together, the results point to a causal impact of Protestantism. In what follows, I examine this effect more rigorously by using princes'

religion in the aftermath of the Peace of Augsburg as an instrumental variable for whether individuals today self-identify as Protestant.

Although the historical record suggests that a territory's official religion in the aftermath of the Peace stands a reasonable chance of satisfying the exogeneity assumption required for a valid instrument, this is not verifiable. To address potential concerns regarding the validity of the instrument, I follow a two-pronged approach. First, I also present results that rely on rulers' *residualized* choices as an instrument, i.e., purged of the effect of all factors that Cantoni (2012) and Rubin (2014) have shown to be correlated with the adoption of Protestantism. In these specifications, identification comes solely from the idiosyncratic component of princes' decisions. Second, in Section VII.C, I use Bayesian methods developed by Conley et al. (2012) to probe the robustness of the main result with respect to general violations of the exclusion restriction.

Table 7 presents two-stage least squares estimates using rulers' actual as well as their residualized choice of religion as instrumental variable. The particular form of the estimating equation is

$$(9) \quad y_i = \beta_P \text{PROTESTANT}_i + \mathbf{X}'_i \boldsymbol{\gamma} + \mathbf{Q}'_c \boldsymbol{\lambda} + \mu_s + \varepsilon_i,$$

with the first stage given by (7).

Taking the IV estimates in the upper panel at face value, the results indicate that Protestantism induces individuals to work approximately three to four hours more per week, which is accompanied by an increase in earnings of about 13%. Both effects are economically very large and statistically significant, or marginally so. Again, there is no evidence to conclude that Protestantism affects wages.

Since the instrumental variables strategy in the lower panel relies on less variation than that in the upper one, it is not surprising that the corresponding coefficients are less precisely estimated. If anything, however, the coefficients in the lower panel are somewhat larger. At the same time, the size of the standard errors makes quantitative comparisons difficult. In fact, even for the estimates that are statistically distinguishable from zero, it is generally not possible to rule out that Protestantism exerts only moderate effects.

Notwithstanding the size of the confidence intervals, the two-stage least squares point estimates with respect to hours worked and earnings are perhaps much larger than one might have expected. It is, therefore, important to put them into perspective. The effect on hours

worked, for instance, equals approximately one-third of the mean difference between males and females. Such an effect size might not be unreasonable if Protestantism causes men to work only slightly harder, but induces more females to take up full-time employment. As I show below, there is some suggestive evidence to that effect.

However, there is also reason to suspect that the IV estimates in Table 7 are upper bounds on the true individual-level impact of Protestantism. Since the instrument exhibits only county-level variation, estimation by two-stage least squares also picks up any peer or spillover effects as well as complementarities in production within counties.³¹ If, for example, how hard one works depends not only on one's own values, but also on how hard the people with whom one interacts work, then the two-stage least squares estimates would partly reflect these peer effects. Although there would still be an "effect of religion," if one believes that spillover and peer effects are quantitatively important, then the correct counterfactual is not a change in a particular individual's religion, holding all else equal, but a change in the religion of *all* of a county's residents. Given that many regions and countries around the world are religiously quite homogenous (cf. Figure 1), this counterfactual is arguably still interesting, as it speaks to the economic impact of a society's religion and values.

C. Sensitivity and Robustness

Table 8 probes the robustness of the two-stage least squares estimates across different specifications and subsamples of the data. To conserve on space, I present coefficients using princes' actual choices as instrumental variable, as these are generally more precise. Results based on rulers' residualized choices are shown in Appendix Table A.2. The first row in the upper panel displays the baseline estimates, i.e. those from columns (1), (3), and (5) in Table 7. Successive rows expand the set of covariates to include potentially endogenous controls, such as indicator variables for marital status, the number of children, or educational attainment. The lower panel shows results obtained by estimating the model in equation (9) on different subsamples of the data.

All of the point estimates with respect to hours worked and labor income carry the same sign as their counterparts in Table 7. Of the 14 coefficients with respect to wages, only 5 are positive, while the 9 are negative. With one exception, the estimated impact of Protestantism on

³¹ For formal models of peer and effects, see Akerlof (1997), Bernheim (1994), or Cicala et al. (2016).

wages is fairly close to zero. The sign pattern of the coefficients in Table 8 is, therefore, consistent with the findings above.

While the inclusion of additional covariates does, of course, affect individual point estimates, and notwithstanding the fact that the coefficients vary considerably across different subsamples of the data, the effect of Protestantism on hours worked remains economically large and in most cases statistically significant. The estimated impact of Protestantism on earnings is less robust. The standard errors in this case are simply too large to draw strong conclusions, or to distinguish 7 of the 17 coefficients from zero at conventional significance levels.

Interestingly, the estimated effect on income and hours worked is stronger for females than for males and for older than for younger individuals. However, wide confidence intervals make any comparisons speculative.³² In fact, the coefficients for males and females are statistically indistinguishable. I, therefore, caution against interpreting this piece of evidence as more than suggestive. Importantly, the estimates do not appear to be driven by religious differences in the number of children. Controlling for this variable has almost no effect.

As with most IV strategies, there exists the possibility that the main results in Table 7 are driven by some unobservable that is correlated with princes' choices at the end of the sixteenth-century *and* contemporary labor market outcomes. To rationalize the patterns in the data such an unobservable would have to be correlated with hours worked and earnings, but not with wages. A priori, however, one might expect that unobservable factors that are broadly conducive to labor market success would also have an impact on wages.

In order to rigorously assess the robustness of the main result (i.e., that Protestantism induces individuals to work longer hours) to violations of the exclusion restriction, I now turn to Bayesian methods developed by Conley et al. (2012). To this end, consider the following econometric specification:

$$(10) \quad y_i = \beta_P \text{PROTESTANT}_i + \phi_P \text{HISTORICALLY PROTESTANT}_c + \mathbf{X}'_i \boldsymbol{\gamma} + \mathbf{Q}'_c \boldsymbol{\lambda} + \mu_s + \varepsilon_i,$$

where ϕ_P parameterizes the extent to which the exclusion restriction fails. If the exclusion restriction is, in fact, satisfied, then $\phi_P = 0$. That is, princes' decisions exerted no independent effect on present-day labor market outcomes.

³² Becker and Wößmann (2008) document that in nineteenth-century Prussia, the gender gap in education was smaller in predominantly Protestant areas.

Since $PROTESTANT_i$ is endogenous, β_P and ϕ_P cannot be separately identified. It is, however, possible to identify the causal effect of Protestantism, i.e., β_P , and conduct inference conditional on specifying the support or the distribution of ϕ_P (see Conley et al. 2012).

The analysis in Conley et al. (2012) shows that without any information on the direction of the direct effect of rulers' choices, one obtains identical point estimates as in the standard IV setup. The only difference is that the standard errors increase. In Figure 4, I, therefore, focus on the more damaging scenario of prior information that leads one to believe that a prince's choice to convert to Protestantism had a direct, positive impact on hours worked almost 400 hundred years later. Formally, I impose the assumption that ϕ_P is distributed uniformly on $[0, \delta]$ and plot the resulting estimate of the causal effect of Protestantism as well as the 90%- and 95%-confidence intervals. Intuitively, δ denotes the maximal allowable violation of the exclusion restriction, with the econometrician considering all "damaging" scenarios to be equally likely.

Clearly, the estimated effect of Protestantism declines as I allow larger violations of the exclusion restriction. At the same time, it is reassuring that the estimate remains positive as long as one is willing to assume that princes' choices at the end of the sixteenth century exhibit a *direct* effect on hours worked of no more than about 2.5 hours per week. If one is willing to rule out a direct effect of more than about one hour per week, one would even continue to reject the null hypothesis of no effect at conventional significance levels.

VIII. Interpreting the Evidence

Broadly summarizing, the results above suggest that Protestantism has a positive impact on economic outcomes, as indicated by an increase in hours worked and, possibly, higher earnings. However, there is no evidence to conclude that Protestantism also raises wages. This section attempts to distinguish between competing explanations for these results. In particular, I argue that a simple human capital theory of Protestantism is at odds with data, while an explanation based on individual values *is* capable of explaining the findings. In support of this argument, I present additional empirical evidence.

Using an earlier wave of the SOEP, Becker and Wößmann (2009) report that Protestants receive on average .8 more years of schooling than Catholics, and that assuming a labor market return as low as 5.2% would be sufficient to reconcile essentially the whole *earnings* gap of 4.8%. A human capital theory of Protestantism, however, cannot explain why there appears to be

no effect on wages. If Protestants invested more in education, one would expect this to be reflected not only in higher earnings, but also in higher wages.^{33, 34}

Table 9 studies these issues further by reporting reduced form and two-stage least squares estimates of the effect of Protestantism on several additional outcomes: years of schooling, college graduation, net wealth, contractual hours of work, *desired* hours of work, females' propensity to take up full-time employment, and the probability of being self-employed. All specifications include the full set of individual and county level covariates. The results in the right column also control for state fixed effects (which comes at the cost of losing precision, but removes potential bias from unobserved state-level variation in institutions).

In light of the conflicting sign pattern, and given the size of the standard errors, I find little to no evidence of a consistently positive effect of Protestantism on educational attainment among Germans today.³⁵ The remaining coefficients in Table 9, however, hint at a positive impact of Protestantism on net wealth, self-employment, and females' propensity to take up full-time work. The respective estimates are again large, but very imprecise. Given the size of the corresponding standard errors, these results ought to be taken with a large grain of salt. By contrast, the point estimates with respect to "contractual hours of work" are precise enough to conclude that Protestants take jobs that require longer hours.³⁶

The most important piece of evidence in favor of a values- rather than human capital-based explanation comes from the question: "If you could choose your own number of working hours, taking into account that your income would change according to the number of hours: How many hours would you want to work?" Consistent with differences in work-related values, the two-stage least squares estimates suggest that, all else equal, Protestants *want* to work about 2.5 hours more per week than Catholics.

Table 10 explores how much of the estimated impact of Protestantism on earnings and hours worked can be explained by this crude proxy for an individual's work ethic. Surprisingly,

³³ Given higher wages and if the substitution effect outweighs the income effect, Protestants might also work more.

³⁴ In Germany, a large array of non-pecuniary job benefits, such as health insurance or vacation time, are subject to strict government regulation; and the limited information contained in the SOEP does not point to systematic differences between Catholics and Protestants.

³⁵ Becker and Wößmann (2009) acknowledge that their finding of more years of schooling among Protestants does not hold up later waves of the SOEP. Recall, the model in Section II did not have an unambiguous prediction for the effect of Protestantism on human capital investments.

³⁶ Ancillary analyses show no evidence of religious differences in occupational prestige or the likelihood of working in the public sector.

controlling for “desired hours of work” reduces the estimated effect on hours worked and earnings by almost three quarters.

By contrast, accounting for educational attainment or time spent in church—another candidate explanation for why Protestants work longer hours than Catholics—makes very little difference to the point estimates. In sum, the results in this paper are difficult to reconcile with a human capital theory of Protestantism. They *are* consistent, however, with a simple explanation based on values. Remarkably, a single proxy for individuals’ work-related values can account for most of the estimated effect of Protestantism on hours worked and for almost all the effect with respect to earnings.

IX. Conclusion

Ever since Weber’s (1904/05) *The Protestant Ethic and the Spirit of Capitalism*, there has been controversy about the effect of religion on economic growth and development. Even contemporary data feature a correlation between religion and countries’ GDP per capita.

This paper studies the relationship between Protestantism and labor market outcomes in present-day Germany. To address the endogeneity of religion, I exploit variation in the geographic distribution of Catholics and Protestants due to a provision in a sixteenth-century peace treaty. Both reduced form and instrumental variables estimates indicate that Protestantism increases hours worked. There is also evidence of a commensurate effect on earnings. At the same time, Protestantism has no detectable impact on wages.

I argue that neither institutional factors nor religious differences in human capital acquisition can account for the patterns in the data. Instead, I present evidence in favor of a values-based explanation.

It is important to point out, however, that my analysis cannot distinguish between general, work-related attitudes and the specific values and beliefs that Weber associated with a Protestant work ethic. Whether the effect of Protestantism is, indeed, due to diligence, thrift, and the belief in a person’s calling, or to religious differences in more mundane values, such as gender roles, conservatism, or patience, remains an important question for future research.

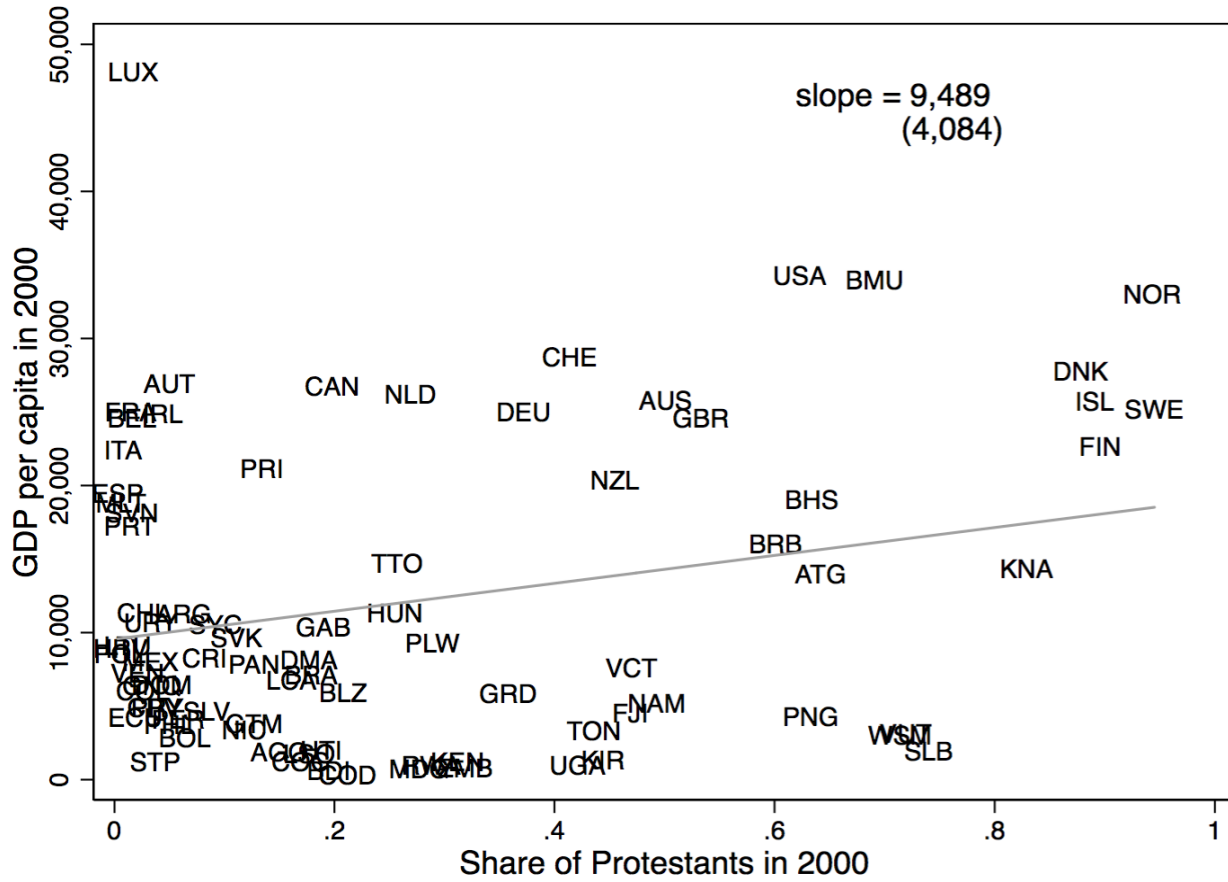
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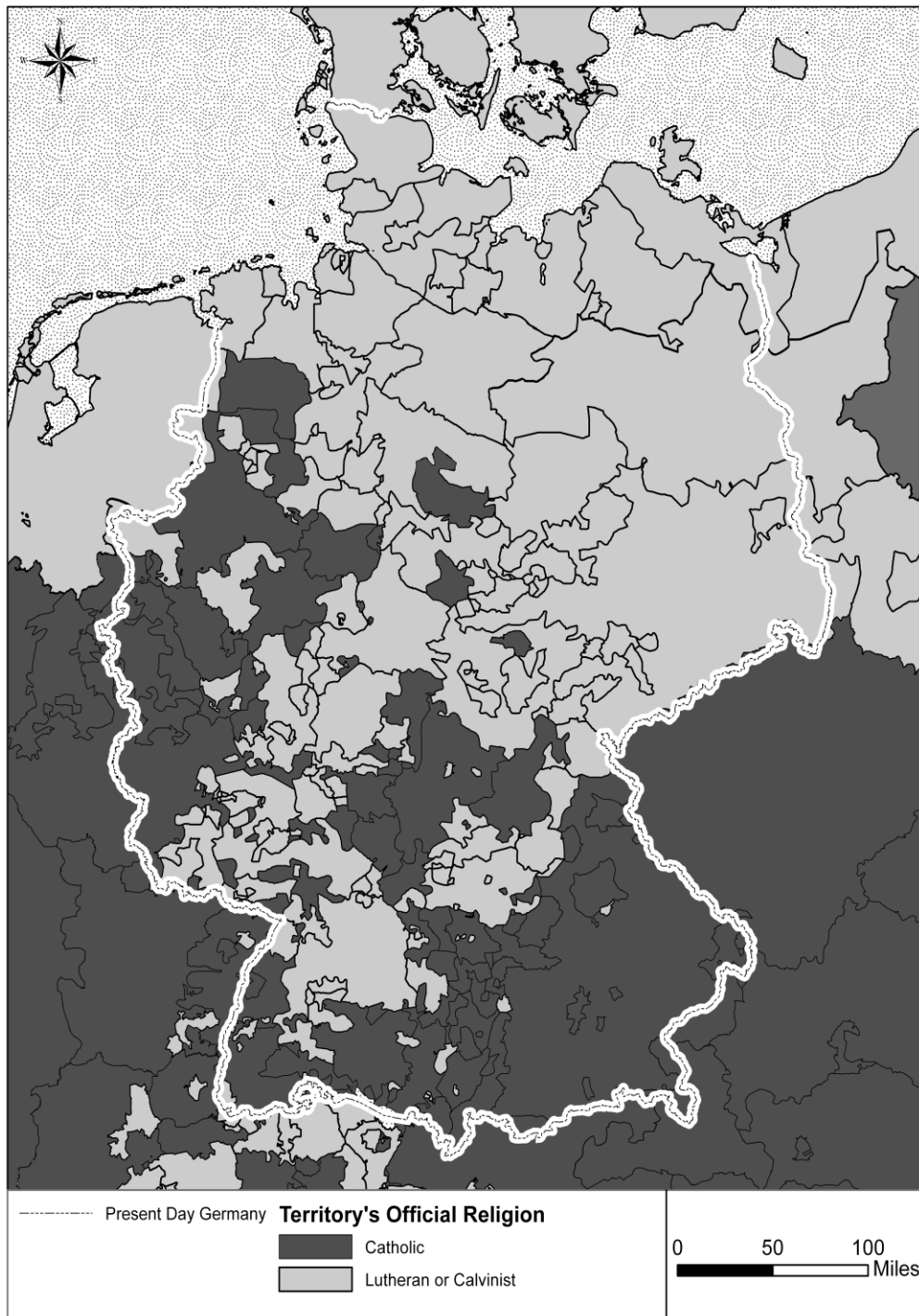
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Figure 1: The Correlation between GDP per Capita and Share of Protestants



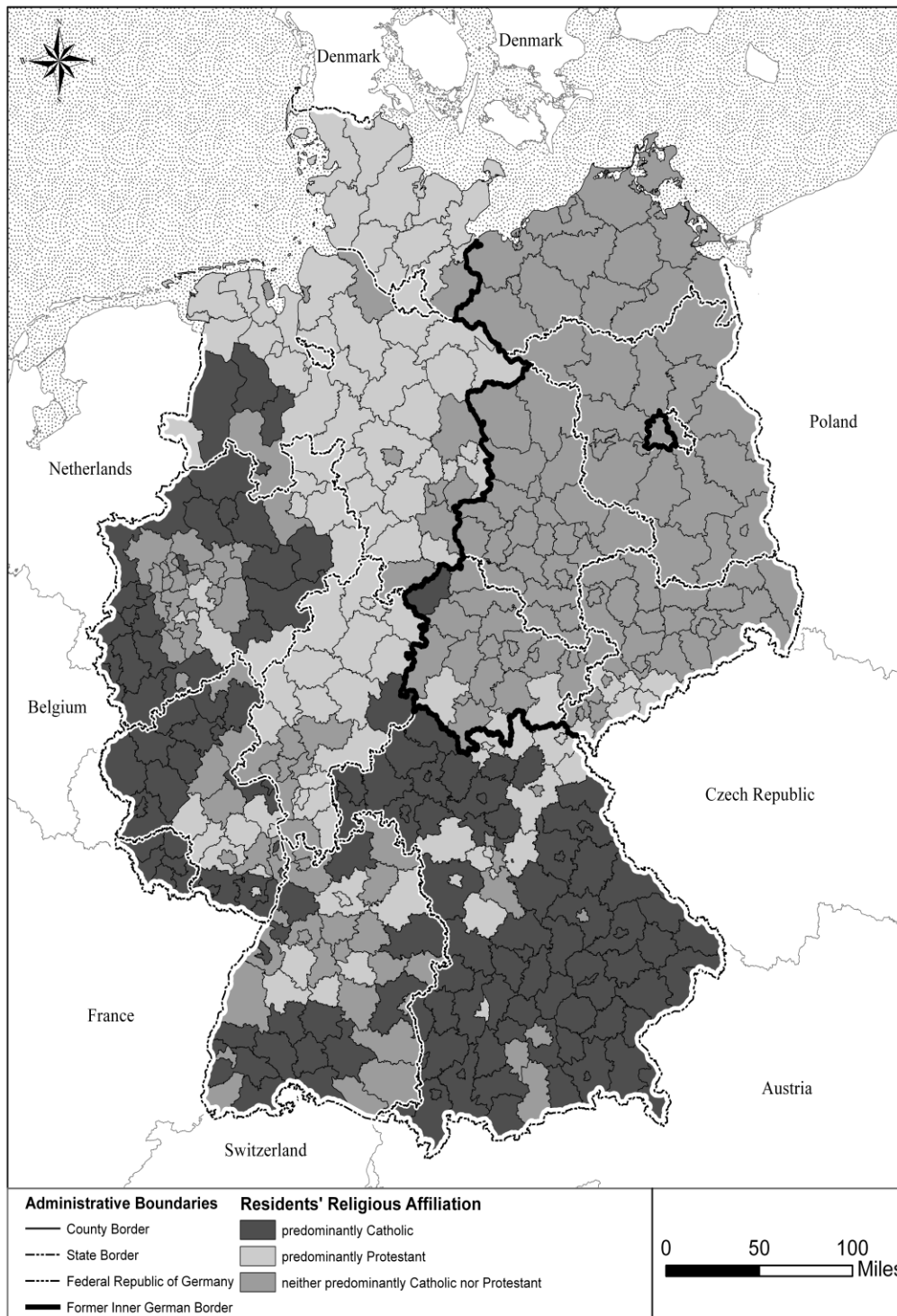
Notes: GDP per capita is measured in purchasing power adjusted 2000 USD. The sources of GDP per capita and Share of Protestants are Penn World Table 6.2 (Heston et al. 2006) and Barrett et al. (2001), respectively. The Data Appendix provides further detail. See Becker and Wößmann (2009) for a very similar figure with 1900 as base year.

Figure 2: The Religious Situation in the Holy Roman Empire Before the Thirty Years' War



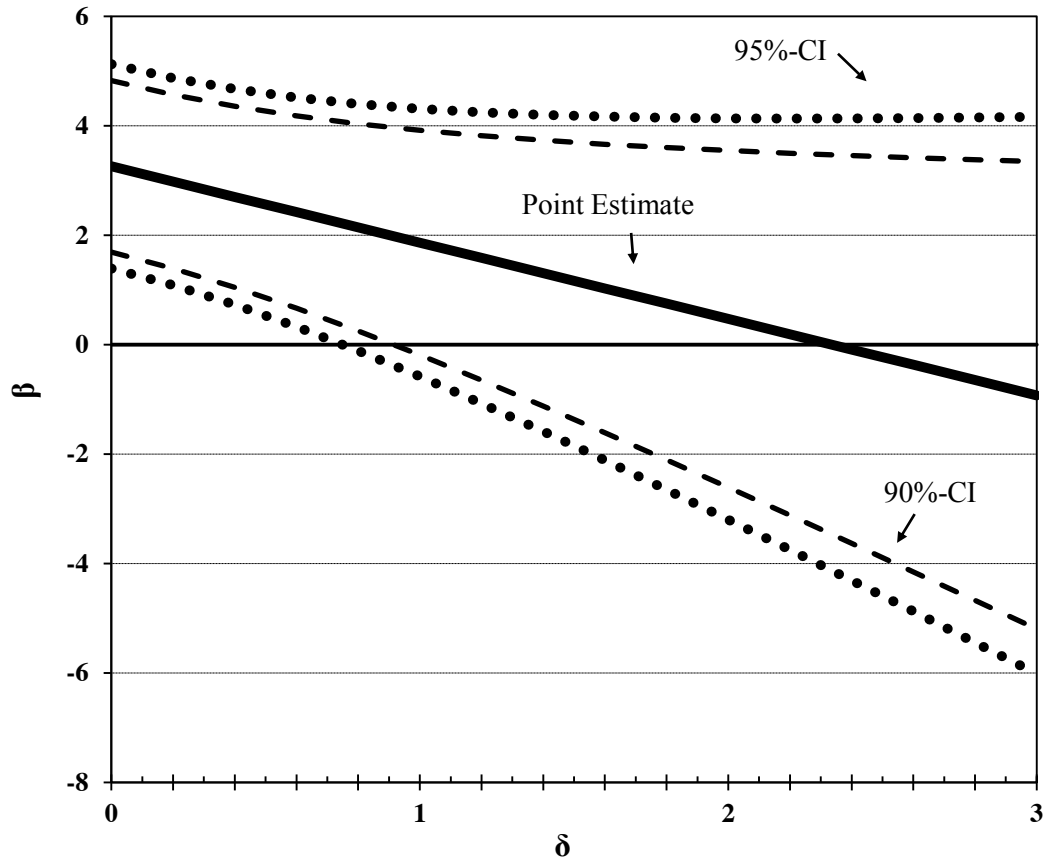
Sources: Based on Kunz (1996) and the information in Schindling and Ziegler (1992a, 1992b, 1993a, 1993b, 1995, 1996).

Figure 3: The Religious Situation in Present Day Germany



Sources: Author's calculations based on SOEP data and Statistisches Bundesamt (1990).

Figure 4: Inference Allowing for Violations of the Exclusion Restriction



Notes: Figure depicts point estimates as well as 90% (dashed line) and 95% (dotted line) confidence intervals for the effect of Protestantism on hours worked. Estimates are based on the assumption that ϕ in equation (10) is distributed $U(0, \delta)$. See the main text as well as Conley et al. (2012) for details on the estimation procedure.

Table 1: Individual-Level Descriptive Statistics

Variable	Full Sample	Catholics	Protestants	Nonreligious
Demographics:				
Female	.468 (.499)	.494 (.500)	.491 (.500)	.378 (.485)
Age	43.52 (10.46)	43.13 (10.53)	43.51 (10.75)	44.30 (9.69)
Number of Children	1.318 (1.143)	1.415 (1.138)	1.395 (1.154)	.991 (1.071)
Years of Schooling	12.30 (2.62)	12.15 (2.56)	12.28 (2.63)	12.61 (2.66)
Marital Status:				
Single	.242 (.428)	.241 (.428)	.226 (.418)	.274 (.446)
Married	.641 (.480)	.663 (.473)	.664 (.472)	.557 (.497)
Divorced	.095 (.293)	.075 (.263)	.086 (.281)	.151 (.358)
Widowed	.021 (.145)	.021 (.143)	.024 (.152)	.018 (.135)
Distance to Nearest City:				
less than 10 km	.361 (.480)	.328 (.497)	.355 (.479)	.434 (.496)
10 km to 40 km	.445 (.497)	.453 (.498)	.440 (.497)	.436 (.496)
more than 40 km	.194 (.395)	.218 (.413)	.204 (.403)	.130 (.337)
Economic Outcomes:				
Employed Full Time	.611 (.419)	.594 (.431)	.577 (.421)	.711 (.378)
Labor Income (EUR)	2,425 (1,493)	2,292 (1,447)	2,313 (1,442)	2,890 (1,580)
Hours Worked	36.75 (12.82)	35.80 (13.26)	36.18 (12.96)	39.63 (11.19)
Hourly Earnings (EUR)	15.79 (7.00)	15.25 (6.77)	15.30 (6.79)	17.72 (7.49)
Self-Employed	.061 (.201)	.053 (.190)	.062 (.202)	.074 (.218)
Desired Hours of Work	33.36 (9.97)	32.59 (10.54)	33.13 (9.94)	35.27 (8.58)
Religion of Parents:				
Father:				
Catholic	.454 (.498)	.862 (.345)	.117 (.322)	.305 (.461)
Protestant	.484 (.500)	.121 (.326)	.831 (.374)	.525 (.500)
Nonreligious	.048 (.214)	.015 (.121)	.038 (.190)	.133 (.340)
Mother:				
Catholic	.462 (.499)	.927 (.259)	.075 (.264)	.305 (.461)
Protestant	.499 (.500)	.064 (.246)	.899 (.301)	.572 (.495)
Nonreligious	.030 (.171)	.005 (.073)	.023 (.149)	.093 (.093)
Number of Observations	9,286	3,749	3,678	1,859

Notes: Entries are weighted means and standard deviations of individual-level data for those individuals with non-missing information. See the Data Appendix for the precise definition and source of each variable.

Table 2: Selection out of Religion

Independent Variable	Nonreligious											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log Hourly Wages	.123*** (.013)	.094*** (.015)	.086*** (.015)	.085*** (.015)	.137*** (.021)	.099*** (.021)	.092*** (.021)	.094*** (.021)	.078*** (.018)	.057*** (.020)	.050** (.021)	.043** (.021)
Female		-.048*** (.013)	-.051*** (.013)	-.050*** (.013)		-.063*** (.020)	-.065*** (.020)	-.066** (.020)		-.041** (.020)	-.045** (.020)	-.045** (.019)
Age:												
< 30		-.030 (.024)	-.019 (.024)	-.015 (.024)		-.027 (.047)	-.019 (.045)	-.010 (.045)		.002 (.037)	.003 (.038)	-.004 (.036)
30 to 40		.058** (.023)	.070*** (.024)	.072*** (.023)		.021 (.043)	.030 (.044)	.034 (.043)		.033 (.032)	.037 (.032)	.034 (.031)
40 to 50		.051** (.025)	.058*** (.025)	.064*** (.024)		.087* (.049)	.082* (.047)	.083* (.046)		.037 (.033)	.045 (.033)	.044 (.033)
50 to 60		.058** (.025)	.063* (.025)	.065*** (.024)		.079 (.050)	.078 (.049)	.077 (.049)		.040 (.032)	.043 (.032)	.046 (.032)
Distance to Nearest City:												
10 km to 40 km		-.051** (.025)	.009 (.020)	.029* (.016)		-.045 (.028)	.028 (.033)	.033 (.032)		-.011 (.023)	.017 (.025)	.028 (.025)
> 40 km		-.110*** (.030)	-.028 (.025)	-.012 (.021)		-.116*** (.032)	-.003 (.037)	.004 (.037)		-.062** (.026)	-.030 (.030)	-.028 (.030)
Constant	-.118*** (.038)	-.013 (.053)	-.279 (.456)		-.148*** (.053)	-.020 (.066)	.236 (.853)		-.094** (.047)	-.028 (.063)	-.548 (.563)	
Mean of Dependent Variable	.200											
Sample	All Observations											
County-Level Controls	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
State Fixed Effects	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
R-Squared	.019	.036	.065	.081	.023	.047	.086	.098	.012	.023	.033	.048
Number of Observations	9,286	9,286	9,286	9,286	2,575	2,575	2,575	2,575	2,523	2,523	2,523	2,523
	.220											
	Two Protestant Parents											
	.121											
	Two Catholic Parents											

Notes: Entries are coefficients and standard errors from regression an indicator variable for whether an individual self-identifies as "nonreligious" on different individual- and county-level observables. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. In addition to the variables shown in the table, indicator variables for missing values on each covariate are also included in the regressions. ***, **, * and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: OLS Estimates of the Partial Correlation between Religion and Work-Related Outcomes

Independent Variable	Hours Worked				Log Hourly Wages				Log Labor Income			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Protestant	.379 (.347)	.343 (.323)	.282 (.333)	.085 (.352)	.001 (.015)	-.001 (.015)	-.007 (.015)	-.002 (.015)	.020 (.023)	.017 (.023)	.008 (.023)	.003 (.023)
Female												
Age:												
< 30												
30 to 40												
40 to 50												
50 to 60												
Distance to Nearest City:												
10 km to 40 km												
> 40 km												
Constant	35.804*** (.254)	40.348*** (.872)	38.501*** (10.020)		2.630*** (.011)	2.761*** (.033)	1.358*** (.497)	1.304** (.528)	7.495*** (.017)	7.758*** (.056)	6.138*** (.662)	
County-Level Controls	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
State Fixed Effects	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
R-Squared	.000	.330	.332		.000	.123	.135	.145	.000	.282	.289	.296
Number of Observations	7,427	7,427	7,427	7,427	7,427	7,427	7,427	7,427	7,427	7,427	7,427	7,427

Notes: Entries are coefficients and standard errors from estimating equation (5) by weighted least squares, with the sample restricted to self-identified Protestants and Catholics. The respective dependent variables are listed at the top of each column. Heteroskedasticity-robust standard errors are clustered by county and reported in parentheses. In addition to the variables shown in the table, indicator variables for missing values on each covariate are also included in the regressions. ***, **, and * denote statistical significance at the 1%, 5%, and 10%-levels, respectively.

Table 4: County-Level Summary Statistics

Variable	Full Sample	Historical Religion		<i>p</i> -value Catholic = Protestant
		Catholic	Protestant	
Total Population (in 1,000)	163.1 (140.9)	192.2 (161.8)	145.2 (123.8)	.296
Population per Square Kilometer (in 1,000)	.462 (.621)	.543 (.733)	.414 (.536)	.530
Number of Businesses (per 1,000 Residents)	1.718 (7.514)	2.093 (10.217)	1.488 (5.219)	.495
Employment by Sector (percent):				
Manufacturing	28.24 (8.67)	29.60 (8.48)	27.41 (8.70)	.147
Services	68.59 (9.39)	67.21 (9.62)	69.43 (9.16)	.259
Hospitals (per 1,000 Residents)	.067 (.264)	.073 (.304)	.062 (.235)	.694
Welfare Recipients (per 1,000 Residents)	7.058 (27.71)	7.831 (37.81)	6.584 (19.11)	.678
Educational Institutions (per 1,000 Residents):				
Preschools	.031 (.078)	.013 (.036)	.042 (.094)	.043
Elementary Schools	.565 (2.032)	.639 (2.632)	.519 (1.559)	.589
High Schools (<i>Gymnasien</i>)	.099 (.423)	.110 (.568)	.093 (.302)	.675
Universities	.003 (.016)	.002 (.008)	.003 (.019)	.492
Number of Observations	437	166	271	

Notes: Entries are means and standard deviations of county-level data for those counties with non-missing information, by counties' historical religion. The rightmost column shows *p*-values for tests of equality in means between historically Catholic and Protestant counties, adjusted for clustering by state. See the Data Appendix for the precise definition and source of each variable.

Table 5: Territories' Religion in 1624 and Protestantism Today

<i>A. Based on Rulers' Actual Choices</i>				
	Protestant			
	(1)	(2)	(3)	(4)
Historically Protestant	.361*** (.032)	.361*** (.032)	.319*** (.034)	.256*** (.038)
Demographic Controls	No	Yes	Yes	Yes
County-Level Controls	No	No	Yes	Yes
State Fixed Effects	No	No	No	Yes
R-Squared	.130	.131	.156	.226
Number of Observations	7,427	7,427	7,427	7,427
<i>B. Based on Rulers' Residualized Choices</i>				
	Protestant			
	(5)	(6)	(7)	(8)
Residualized Choice	.253*** (.044)	.253*** (.045)	.223*** (.042)	.187*** (.042)
Demographic Controls	No	Yes	Yes	Yes
County-Level Controls	No	No	Yes	Yes
State Fixed Effects	No	No	No	Yes
R-Squared	.048	.049	.103	.207
Number of Observations	7,427	7,427	7,427	7,427

Notes: Entries are coefficients and standard errors from estimating equation (7) by weighted least squares, with the sample restricted to self-identified Protestants and Catholics. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. In addition to the variables shown in the table, indicator variables for missing values on each covariate are also included in the regressions. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.

Table 6: Reduced Form Estimates

<i>A. Based on Rulers' Actual Choices</i>						
	Hours Worked		Log Hourly Wages		Log Labor Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Historically Protestant	1.177*** (.329)	1.027*** (.402)	.001 (.018)	.001 (.018)	.047** (.024)	.036 (.025)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
County-Level Controls	No	Yes	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes
R-Squared	.332	.336	.123	.145	.283	.297
Number of Observations	7,427	7,427	7,427	7,427	7,427	7,427
<i>B. Based on Rulers' Residualized Choices</i>						
	Hours Worked		Log Hourly Wages		Log Labor Income	
	(7)	(8)	(9)	(10)	(11)	(12)
Residualized Choice	1.017*** (.374)	.904** (.450)	.008 (.022)	.009 (.021)	.045 (.030)	.038 (.029)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
County-Level Controls	No	Yes	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes
R-Squared	.331	.336	.123	.145	.282	.297
Number of Observations	7,427	7,427	7,427	7,427	7,427	7,427

Notes: Entries are coefficients and standard errors from estimating equation (8) by weighted least squares, with the sample restricted to self-identified Protestants and Catholics. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. In addition to the variables shown in the table, indicator variables for missing values on each covariate are also included in the regressions.

***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.

Table 7: 2SLS Estimates of the Effect of Protestantism on Work-Related Outcomes

<i>A. Based on Rulers' Actual Choices</i>						
	Hours Worked		Log Hourly Wages		Log Labor Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Protestant	3.261*** (.953)	4.004** (1.721)	.003 (.050)	.005 (.069)	.130* (.069)	.142 (.101)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
County-Level Controls	No	Yes	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes
First Stage F-Statistic	126.87	45.30	126.87	45.30	126.87	45.30
Number of Observations	7,427	7,427	7,427	7,427	7,427	7,427
<i>B. Based on Rulers' Residualized Choices</i>						
	Hours Worked		Log Hourly Wages		Log Labor Income	
	(7)	(8)	(9)	(10)	(11)	(12)
Protestant	4.018*** (1.600)	4.841* (2.635)	.031 (.087)	.046 (.118)	.180 (.121)	.206 (.163)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
County-Level Controls	No	Yes	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes
First Stage F-Statistic	32.38	19.49	32.38	19.49	32.38	19.49
Number of Observations	7,427	7,427	7,427	7,427	7,427	7,427

Notes: Entries are coefficients and standard errors from estimating equation (9) by weighted two-stage least squares, with the sample restricted to self-identified Protestants and Catholics. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. In addition to the variables shown in the table, indicator variables for missing values on each covariate are also included in the regressions. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.

Table 8: Sensitivity Analysis of 2SLS Estimates

Specification / Sample	Hours Worked	Log Hourly Wages	Log Labor Income
<i>Controls:</i>			
Baseline Individual Controls	3.261*** (.953)	.003 (.050)	.130* (.069)
Baseline Individual Controls, Education	3.051*** (.908)	-.009 (.042)	.112* (.059)
Baseline Individual Controls, Education, Marital Status	3.059*** (.874)	-.009 (.041)	.113** (.057)
Baseline Individual Controls, Education, Marital Status, Number of Children	3.008*** (.875)	-.009 (.041)	.110** (.057)
Baseline Individual Controls, Education, Marital Status, Number of Children, County Characteristics	3.815*** (1.083)	-.010 (.048)	.138** (.067)
Baseline Individual Controls, Education, Marital Status, Number of Children, County Characteristics, State Fixed Effects	4.340*** (1.651)	.032 (.060)	.183** (.092)
<i>Sample:</i>			
Including East Germans	4.271*** (1.640)	.024 (.066)	.166* (.096)
Including Self-Declared Nonreligious	3.467* (1.964)	-.031 (.076)	.074 (.109)
Protestant or Catholic Parents Only	3.867** (1.972)	-.040 (.083)	.069 (.113)
By Gender:			
Males	2.396 (1.843)	-.051 (.081)	.029 (.105)
Females	5.557 (3.455)	.046 (.107)	.225 (.198)
By Age:			
< 35	1.282 (2.937)	-.004 (.131)	.040 (.196)
35 to 50	3.542 (2.498)	.076 (.103)	.193 (.145)
> 50	6.580** (3.342)	-.134 (.123)	.112 (.185)

Notes: Entries are coefficients and standard errors on "Protestant" from estimating equation (9) by weighted two-stage least squares, with counties' historical religion serving as instrumental variable. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. The sample has been restricted to individuals who self-identify as Protestant or Catholic, except when otherwise noted. The upper panel varies the set of covariates, with the respective controls indicated on the left of each row. The lower panel reports estimates for different subsets of the data, using the baseline individual- and county-level controls as well as state fixed effects. The respective sample restriction is indicated on the left of each row. All specifications include indicator variables for missing values on each covariate. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.

Table 9: Ancillary Evidence

<i>A. Reduced Form Estimates</i>		
Outcome	without State FE	with State FE
Years of Education	-.026 (.120)	-.159 (.139)
College Graduate	.008 (.016)	.004 (.020)
Net Wealth (in 1,000 EUR)	3.033 (5.569)	5.909 (5.924)
Contractual Hours of Work	.871*** (.269)	.556* (.330)
Desired Hours of Work	.796*** (.284)	.724** (.340)
Employed Full Time Female	.026 (.020)	.031 (.027)
Self-Employed	.012* (.006)	.011 (.009)

<i>B. 2SLS Estimates</i>		
Outcome	without State FE	with State FE
Years of Education	-.080 (.369)	-.622 (.553)
College Graduate	.025 (.050)	.014 (.074)
Net Wealth (in 1,000 EUR)	9.565 (17.672)	23.422 (23.834)
Contractual Hours of Work	2.856*** (.914)	2.269* (1.387)
Desired Hours of Work	2.493*** (.918)	2.835** (1.407)
Employed Full Time Female	.093 (.073)	.140 (.126)
Self-Employed	.037* (.022)	.042 (.036)

Notes: Entries are coefficients and standard errors on "Protestant" from estimating the reduced form model by weighted least squares (upper panel), and equation (9) by two-stage least squares (lower panel), with counties' historical religion serving as instrument. Estimates shown in the left column control for the baseline individual- and county-level covariates, while estimates shown in the right column also include state fixed effects. The respective dependent variable is indicated on the left of each row. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. All specifications include indicator variables for missing values on each covariate. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.

Table 10: Estimates Controlling for Education, Time in Church, and a Proxy for Work Ethic

<i>A. Reduced Form Estimates</i>			
Controls	Hours Worked	Log Hourly Wages	Log Labor Income
Baseline	1.027*** (.402)	.001 (.018)	.036 (.025)
Baseline, Education	1.076*** (.384)	.008 (.015)	.045** (.022)
Baseline, Time in Church	.975** (.402)	.004 (.018)	.037 (.025)
Baseline, Desired Hours of Work	.279 (.281)	-.003 (.018)	.003 (.023)
<i>B. 2SLS Estimates</i>			
Controls	Hours Worked	Log Hourly Wages	Log Labor Income
Baseline	4.004*** (1.721)	.005 (.069)	.142 (.101)
Baseline, Education	4.194*** (1.677)	.032 (.060)	.177** (.091)
Baseline, Time in Church	3.878** (1.748)	.014 (.071)	.146 (.103)
Baseline, Desired Hours of Work	1.095 (1.124)	-.014 (.070)	.011 (.090)

Notes: Entries are coefficients and standard errors on "Protestant" from estimating the reduced form model by weighted least squares (upper panel), and equation (9) by two-stage least squares (lower panel), with counties' historical religion serving as instrument. The respective dependent variable is indicated at the top of each column, and the set of included controls is listed on the left of each row. The set of baseline controls includes all individual- and county-level covariates as well as state fixed effects. Heteroskedasticity robust standard errors are clustered by county and reported in parentheses. All specifications include indicator variables for missing values on each covariate. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-levels, respectively.