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# The Beloved Myth: Protestantism and the Rise of Industrial Capitalism in Nineteenth-Century Europe<sup>\*</sup>

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## Abstract

*We investigate the thesis widely credited to Max Weber that Protestantism contributed to the rise of industrial capitalism by estimating the associations between the percentage of Protestants and the development of industrial capitalism in European countries in the mid- to late nineteenth century. Development is measured using five sets of variables, including measures of wealth and savings, the founding date of the principal stock exchange, extension of the railroads network, distribution of the male labor force in agriculture and in industry, and infant mortality. On the basis of this evidence, there is little empirical support for what we call the “Common Interpretation” of Weber’s The Protestant Ethic, namely the idea that the strength of Protestantism in a country was associated with the early development of industrial capitalism. The origin of the Common Interpretation and its popular success are probably derived largely from selected anecdotal evidence fortified, through retrospective imputation, by the perceived well-being of contemporary Protestant countries.*

Max Weber’s thesis in *The Protestant Ethic and the Spirit of Capitalism* (1958) on the relationship between Protestant religious ethic and economic outcomes has been the object of endless exegesis and multiple re-interpretations (George &

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George 1961; Glock & Hammond 1973; Green 1959; Hagen 1962; Hudson 1961; Lowy 1989; Luthy 1970; MacKinnon 1994; McClelland 1961; Nelson 1969, 1973; Swanson 1967; Trevor-Roper 1968; Troeltsch 1958; Warner 1970; Zaret 1992). This exegesis sometimes takes exotic turns — disputes by modern-day scholars with the ghosts of Marx, Sombart, and Weber (e.g., Fishman 1989); *a contrario* demonstrations of the existence of the Protestant ethic among such dubious prospects as the Cajuns of Louisiana (Gramling, Forsyth & Mooney 1987); and even attacks on Weber's grasp of Protestantism based on esoteric theological grounds (MacKinnon 1988; Tawney [1922] 1962). In other words, Weber's thesis has been served with every kind of sauce.

The task of discovering what Weber really meant may be hopeless for several reasons: the subtlety of his argumentation, his sometimes idiosyncratic expository style (Fischhoff 1968; MacKinnon 1988), obscurities resulting from Talcott Parsons' translation, the complex relationships between this comparatively self-contained essay and the rest of Weber's massive and junglelike work on religion (see Talcott Parsons' preface to Weber 1958), and, last but not least, the quasi-sacred status that Weber's *opus* in general and *Protestant Ethic* in particular have acquired in the contemporary social sciences. Despite the lack of resolution on its deeper issues of meaning, the main thesis in *Protestant Ethic*, in a simplified form, maintains a high level of currency in American academic discourse while it also continues to influence significantly the mainstream culture of English-speaking countries. Surprisingly, this strong influence has been and continues to be exercised without benefit of overwhelming, or even of moderately strong, empirical evidence for the postulated relationship between Protestantism and the development of industrial capitalism.

In this paper, we deliberately eschew further exegesis of *Protestant Ethic*. We do not propose a new "true" rendition of Max Weber's thinking. We argue instead that, irrespective of what Max Weber may have himself believed or written, there is a dominant interpretation of *Protestant Ethic* that has taken a life of its own. This is the belief that the rise of industrial capitalism was facilitated in predominantly Protestant countries and occurred earlier there as a consequence. We call this dominant view the *Common Interpretation*; its pervasive influence on social commentary and academic culture is sketched here. Using simple graphical displays and bivariate measures of association with European countries as units of analysis, we examine the credibility of the Common Interpretation by estimating the associations between Protestantism and the development of industrial capitalism, as expressed by five sets of indicators. Our results suggest that the Common Interpretation, despite its widespread acceptance, does not have much factual validity. We propose that the Common Interpretation of Weber's thesis, and its popular appeal, may be based on an illusion based on the strong relationships between certain aspects of industrial capitalist development and Protestantism that

became established at the time of Weber's writing and afterward, but did not hold earlier, as the causal argument inherent in the Common Interpretation requires.

## The Common Interpretation

### A FORMULATION OF THE COMMON INTERPRETATION

For purposes of empirical testing, we would like to derive a summary formulation of the Common Interpretation combining three features: It has empirically testable implications; it represents a fair rendition of the thinking of real people (in other words, it is not a straw man); and it is intelligent and thus avoids obvious inconsistencies that are easy targets for attack. Versions of the Common Interpretation fulfilling these desiderata can be found in such contemporary sociological writings as Goldstone (1987) or Martinelli and Smelser (1990), among others. Rather than assembling a composite from several sources, we use as our summary formulation a moderate version of Weber's thesis that is also influential, as it is contained in a popular macrosociology textbook (Lenski, Nolan & Lenski 1995:244–45).<sup>1</sup> All quoted passages below are from this source.

The Common Interpretation decomposes the relationship between the Protestant religious ethic and the rise of industrial capitalism into three steps.

1. *The Protestant Reformation fostered new attitudes.*

“[A] number of the new Protestant doctrines substantially altered the thinking of many members of agrarian societies [in three areas].”

The new Protestant doctrines:

a. “[T]aught that work is an important form of service to God” and “supported the efforts of merchants and craftsmen to upgrade their status,” challenging “both the medieval Catholic view of work as a punishment for sin and the traditional aristocratic view of work as degrading and beneath the dignity of a gentleman.”

b. “[U]ndermined fatalism and trust in magic and, in the long run, stimulated the spread of rationalism.”

c. “[E]mphasized the value of denying the pleasures of this world and living frugally, a practice that enabled those who became economically successful to accumulate capital.”

2. *The new attitudes (the “Protestant ethic”) affected behaviors.*

“To the extent that people followed these teachings, they developed a new outlook on life: they worked harder, acted more rationally, and lived more thriftily.”

3. *The new attitudes and behaviors favored economic development and contributed to the Industrial Revolution.*

"[T]he Reformation remolded the attitudes, beliefs, and values of countless people in ways that undermined the traditional agrarian economy and stimulated economic and technological innovation." "[T]he Protestant Reformation was an important link in the chain of causation that led to the Industrial Revolution, even if it was not the critical link that some have suggested." "[I]t seems more than coincidence that the Industrial Revolution had its beginning in predominantly Protestant nations." (244-45)

This formulation has four important implications for empirical testing. First, the spread of Protestantism is explicitly linked, in a causal sense, with economic development and with the origins of the Industrial Revolution, although in this moderate version of the Common Interpretation the causal impact is described as "important" rather than "critical." Second, the formulation contains the explicit hypothesis (presented as a statement of fact) that the Industrial Revolution began in "predominantly Protestant nations." This statement (note the use of the plural) explicitly postulates an association *at the national level* between Protestant dominance and early industrialization. Third, the empirical prediction has to do with the beginning of the Industrial Revolution, which took place in Europe (rather than the later diffusion of industrialization overseas). Fourth, the contrast is explicitly drawn between the ideas of the Reformation and the Catholic tradition (rather than between the former and other religions, such as Islam, for instance).

#### THE IMPORTANCE OF THE COMMON INTERPRETATION

While *The Protestant Ethic* may or may not have been intended by Max Weber as a purely historical account of the rise of capitalism, the Common Interpretation derived from it has had influence, and even practical ramifications, much beyond the study of European history.

The Common Interpretation views economic behavior as rooted in attitudinal — psychological and moral — processes within individuals. One of the most productive intellectual heirs to the Common Interpretation, the modernization theory school of national economic development, has emphasized this psychological focus (Eisenstadt 1987a, 1987b; Jensen 1990; Portes 1973; So 1990). Modernization theorists (among other claims) stress the **role of appropriate cultural values as a precondition of economic development**. Some researchers in the modernization theory tradition acknowledge an explicit filiation to Weber in their work (Bellah 1968; Eisenstadt 1968; Rostow 1963; Singer 1966; Stokes 1975; Willems 1968); some extend the Weberian tradition by seeking religious analogues of the (European) Protestant ethic in various non-European cultures to account for the differential economic performance of nation-states (Ali 1988; Bellah 1957; McClelland 1961; Morishima 1990; So 1990). Thus the modernization perspective seems to mimic the Weberian argument in its form by positing that the psychosocial transformation of individuals is the critical precondition to economic

progress on a large scale (e.g., Inkeles & Smith 1974). Hence, it diverges markedly from both neoclassical economic theory — with its more or less invariant *homo economicus* — and from structurally and institutionally oriented theories of economic development that are also prominent in sociology, such as world system theory (Wallerstein 1974) and its forerunners (Horowitz 1970; Myrdal 1956). (On world system theory see also Chirot 1985; Chirot & Hall 1982; Delacroix & Ragin 1981; Portes 1973.)

The Common Interpretation is also surprisingly pervasive in American business schools, partly because of the discovery of the “globalization” of business and the subsequent vogue of curriculum internationalization starting in the 1980s. Thus, a well-known international marketing textbook displays a large table showing countries’ dominant religions side by side with their GNP per capita (Terpstra & David 1985). The clear implication is that Protestant strength is associated with economic success at the national level. Similarly, and while it possesses its own intellectual roots, Hofstede’s (1980) monumental study of the influence of national cultures on managerial practice relies heavily on Weber, both directly and indirectly through its borrowing from modernization theory. Many management and marketing textbooks echo the Common Interpretation, with or without explicit acknowledgment of Weber (e.g., Daniels & Radebaugh 1998:70). The Common Interpretation has a natural affinity with the fast developing field of business ethics (Fox 1987; Quinney 1981; Wayne 1989) and also frequently provides the major intellectual underpinning of policy-oriented books situated at the boundary of scholarly endeavor and popular culture, such as Harrison (1992).

Beyond academic circles and endeavors, the Common Interpretation exercises a ubiquitous influence on the day-to-day culture of the college educated in North America. Educated people often possess an implicit understanding of the Common Interpretation because they have been exposed to more or less diluted renditions of *Protestant Ethic* in an introductory sociology class.<sup>2</sup> Further evidence of widespread familiarity with this aspect of Weber’s work outside the field of sociology abounds.<sup>3</sup>

## EMPIRICAL STATUS OF THE COMMON INTERPRETATION

### *Historical Studies*

How much empirical evidence is there for the Common Interpretation? Weber’s work inspired an abundant stream of research, too rich to be reviewed exhaustively here. It comprised various historical studies linking religion and ethics with various aspects of capitalism. Weber himself often illustrated the Protestant ethic with anecdotes from Benjamin Franklin’s ([1733] 1903) *Poor Richard’s Almanack*, but even this informal utilization raises issues of validity.<sup>4</sup> He did recognize the need for empirical verification and accordingly discussed a 1901 comparative study of

Baden Protestants and Catholics indicating a greater propensity of the former to select schools, subjects, and occupations conducive to entrepreneurial careers, and to greater average wealth (Weber 1958; Samuelsson [1957] 1993).<sup>5</sup>

Many historical studies undermine rather than strengthen the Common Interpretation. Fischhoff (1968) reviewed early European criticisms of a putative geographic coincidence between Calvinism and early manifestations of capitalism. Cummins (1988) demonstrated with archival data that many of the business practices Weber associated with the Reformation, including usury and speculative purchasing, were already legitimized in Catholic sixteenth-century Mexico. Another archival study, based on confessional records, indicates that Catholic Italian merchants suffered progressively fewer pangs of conscience regarding their practice of usury after the fourteenth century (Nelson 1947; see also Groethuysen [1927] 1968). Samuelsson ([1957] 1993) documents several additional instances in which a feature of capitalism could not possibly have been due to Protestantism, since it actually preceded the Reformation (see also Cohen 1980, 1983; Delacroix 1995; Holton 1983; Tawney [1922] 1962). In fact the historical evidence establishing that some element or other of capitalism predates the Reformation itself is so strong that historian Braudel (1977) was moved to write:

For Max Weber, capitalism in the modern sense of the word was no more and no less than a creation of Protestantism or, to be even more accurate, of Puritanism.

All historians have opposed this tenuous theory, although they have not managed to be rid of it once and for all. Yet it is clearly false. The northern countries took over the place that earlier had so long and so brilliantly been occupied by the old capitalist centers of the Mediterranean. They invented nothing, either in technology or in business management.<sup>6</sup> (pp. 65–66)

### *Comparative Implications of the Common Interpretation*

With respect to the eighteenth-century emergence of industrial capitalism in western Europe, the Common Interpretation has historical-comparative implications at three main levels of analysis: individuals, countries, and in some cases regions within countries. The three kinds of implications of the Common Interpretation provide corresponding empirical opportunities for support or partial falsification of the interpretation.

At the individual level, the Common Interpretation implies that individual Protestants should have historically exhibited a greater affinity than individual Catholics for the activities that characterize industrial capitalism. One would therefore expect that, in religiously heterogeneous countries, Protestants are overrepresented in occupations, such as entrepreneurship, that typify industrial capitalism. Weber's own use of the 1901 Baden study illustrates this point.

At the level of entire societies, the Common Interpretation suggests that industrial capitalism should have developed earlier in Protestant than in Catholic countries. This societal-level implication of the Common Interpretation is explicit in the assertion by Lenski, Nolan and Lenski (1995) that the industrialization began in “predominantly Protestant countries” and in the remark by a prominent exponent of modernization theory that “many seek in the Protestant ethic or some equivalent the key to an understanding of why some non-Western countries have achieved modernization” (Eisenstadt 1968:3). The implication is also broadly and mostly unquestioningly adopted by business scholars (e.g., Pasquero 1997).

In dramatic support of the Common Interpretation is the little-disputed observation that modern capitalism first emerged in the predominantly Protestant United Kingdom. Anomalous with the Common Interpretation, as we will document systematically later, are the evident precociousness of mainly Catholic Belgium and France according to almost all indicators of industrial capitalist development, and the relative lateness of nearly all-Protestant Nordic countries. We focus in this paper on these societal-level implications of the Common Interpretation, relating systematically the religious composition of countries with the tempo of industrial capitalist development.

Finally the Common Interpretation implies that, in religiously heterogeneous countries, Protestant regions should exhibit a greater affinity for industrial capitalism than non-Protestant ones, and therefore industrialize earlier. Germany, the Netherlands, and Switzerland are each about 40% Catholic. Because members of the Protestant and Catholic faiths are concentrated in specific regions, these three countries provide opportunities for empirical historical tests of the Common Interpretation at the regional level. Here too, some regional patterns constitute conspicuous anomalies with respect to the Common Interpretation. A prominent instance is that of the Rhine and Ruhr valleys, which are the heart of both German industry and German Catholicism. We will discuss regional analyses further in the concluding section of this article.

#### CRITIQUES OF THE COMMON INTERPRETATION

The Common Interpretation described here has sometimes been criticized for oversimplifying or even betraying Weber’s own thinking. Although we do not propose an exegesis of Weber’s true meaning, we must take note of three important theoretical critiques of the Common Interpretation. These arguments are often attributed to Max Weber himself, and taken as evidence that the Common Interpretation as we have presented it is an incorrect rendition of his original intent.



*The Protestant Minority Argument*

An alternative interpretation of the relationship between Protestantism and industrial capitalism is that a small elite of Protestant entrepreneurs might have been sufficient to build industrial capitalism in a country, using a largely non-Protestant, presumably Catholic, labor force. In that view, although Protestants are few in numbers, their role is crucial because they act as a leavening agent for the rest of the population as entrepreneurs, leaders, and role models (Bellah 1968). The percentage of Protestants in the population might therefore be unrelated to the tempo of capitalist industrial development, as long as a country has the requisite small Protestant vanguard. This interpretation, which potentially precludes any empirical prediction concerning the relationship between Protestant dominance and industrial capitalism, may be consistent with Weber's desire to refute Sombart's claim of a central role for the Jews (undoubtedly a minority) in the rise of capitalism. However, the Protestant minority view is not shared by other contemporary authors, who argue that the mental disposition of employees, not only that of entrepreneurs, is an important part of the genesis of capitalism (e.g., Fischhoff 1968; Lenski, Nolan & Lenski 1995; Martinelli & Smelser 1990). The latter view is arguably consistent with Weber's own discussion of the role of Protestant labor in general (1958), which is often overshadowed by his better-known discussion of the influence of Protestantism on entrepreneurship. This interpretation implies that it is the overall proportion of Protestants in the population (combining entrepreneurs and others) that should be related to an early onset of industrial capitalism.

*Sect versus Church Protestantism*

The Common Interpretation assumes that "all kinds of Protestantism" are favorable to capitalist development. An alternative interpretation emphasizing another part of Weber's work (Weber [1946] 1958) assigns the essential role to *sect* Protestants (i.e., essentially Puritans) rather than *church* Protestants (such as Lutherans and Anglicans), the latter being relegated in that scenario to the same passive role as Catholics (see also Eisenstadt 1968). An anonymous reviewer who reminded us of this alternative explanation agrees that it does not work empirically any better than the Common Interpretation, which does not distinguish among kinds of Protestantism. We have in fact additional results (not presented here) that show that the percentage of sect Protestants is no more significantly related to industrial development than the percentage of Protestants, for three of our indicators of capitalist development.<sup>7</sup>

*The Timing of Protestant Influence and the Iron Cage of Capitalism*

A third important qualification of the Common Interpretation is related to the second. It interprets Weber's thesis as indicating ascetic Protestantism (Calvinism and Pietism) played an initial role in the shift from traditional to modern modes of action in economics, intellectual inquiry, government, and other realms (Smelser 1994; Weber 1958).<sup>8</sup> Once this shift has taken place in the early development of industrial capitalism, two trends become apparent. First, the initial fervor of the new religion abates as it becomes more accommodating of human weaknesses. Second, the onset of capitalism and rationalism generates an "iron cage" of capitalist competition (including rational bureaucratic constraints on organization) that forces Protestants and non-Protestants alike to conform to the new modes of action. It follows that, as religious fervor attenuates and as non-Protestants become willy-nilly incorporated into the new system, religion becomes less of an explanatory variable in later phases of capitalist development (Lachmann 1989, 2000). This qualification of Weber's argument does not contradict the Common Interpretation as presented, since it still implies that Protestant dominance should have facilitated the initial onset of industrial capitalism, but it suggests that the crucial explanatory variable is the religious composition at the beginning of capitalism development in the early modern period, not at later times.

These three critiques of the Common Interpretation — the "Protestant minority," "sect versus church Protestantism," and "initial impact" arguments — may well represent correct interpretations of Max Weber's own thinking. Since our intent in this article is not to propose a new exegesis of *Protestant Ethic*, we wish to remain agnostic on that point. It suffices to discuss the implications of the critiques for our research design. The Protestant minority argument, if true to Weber's intent, would dissociate him from the national-level implication linking Protestant dominance with early industrialization (and make the Protestant ethic argument unfalsifiable at the national level). We do test the national-level implication because it is so clearly part of the Common Interpretation, as we have shown. However, a failure to find an association at the national level between Protestant strength and indicators of industrial capitalism may not constitute a refutation of Weber's own thinking. The same applies to the distinction between sect and church Protestantism. Finally, the issue of the timing of Protestant influence does not affect the analysis either, since an impact of Protestant dominance limited to an early period would still imply that Protestant countries have a head start in industrial development that should still be detectable much later, especially since the religious composition of European countries has been quite stable over the past three centuries, as we discuss later.

## Research Design, Data, and Methods

## RESEARCH DESIGN

Although Weber himself relied largely on anecdotal evidence, he recommended systematic study of the Protestantism-capitalism relationship. He suggested, for example, “investigating whether and at what points certain correlations between forms of religious belief and practical ethics can be worked out” (1958:91). In the previous section we showed that the Common Interpretation has historical comparative implications for the rise of industrial capitalism at the levels of individual, national, and subnational units (regions). We argued in particular that variants of the Common Interpretation required, explicitly or implicitly, that industrial capitalism should develop first in Protestant-dominated countries. Our research focuses on the national level to investigate predicted differences in the tempo of development of industrial capitalism among countries of Western Europe, where industrialization first originated and diffused. This is achieved by systematically relating the religious composition (percentage of Protestants) of these countries to several indicators of the development of industrial capitalism, to evaluate the general proposition that countries with large proportions of Protestants became industrialized earlier than countries that were largely non-Protestant (i.e., Catholic). We first discuss two general issues of research design.

The first issue is the nature of the evidence necessary to support or refute the Common Interpretation. The causal structure of the Common Interpretation comprises three linkages (Lenski, Nolan & Lenski 1995). The Common Interpretation asserts that: (1) membership in the Protestant faith is associated with certain attitudes or mental predispositions that have come to be known as “the Protestant ethic”; (2) these attitudes and predispositions are positively associated with certain behaviors, such as diligence, rationalism, and thriftiness; and (3) these attitudes and behaviors are favorable to the development of industrial capitalism and are therefore expected to be associated with various indicators of the development of industrial capitalism at the societal level. It follows from the combination of these causal linkages that Protestantism should be positively associated with societal indicators of industrial capitalist development. To *demonstrate* the validity of the Common Interpretation would require a careful examination — to eliminate alternative explanations at each stage — of all three linkages. However, to *falsify* the Common Interpretation it is sufficient to examine the outer link of the causal structure, the summary link asserting the existence of an association between Protestantism and societal indicators of the development of industrial capitalism. Any failure to establish empirically an association between Protestantism and indicators of industrial capitalist development constitutes a presumptive case against the Common Interpretation because it implies that at least one of the intermediate causal links does not hold. We therefore focus on this

outer link (or reduced model) that asserts a positive association between Protestantism and indicators of industrial development.

The second issue is a temporal one. In a *gradualist* view of the effect of religion on capitalist development, industrial capitalism did not emerge all at once but instead developed over a period of time. As the purported cause (Protestantism) must precede, or at least be concurrent with, the purported effect, we would then need to know the religious composition of the countries in the study at every point in time during the period of development, starting at or before the onset of industrial capitalism. In the alternative *initial impact* interpretation of the effect of Protestantism, the relevant variable is Protestant strength at the onset of capitalist development (since religion later ceases to be a factor because of the iron cage phenomenon). The appropriate time of measurement of Protestant strength would be a critical issue if the religious composition of European countries had varied substantially over the industrialization period, since reliable data on religious membership are only available from the early nineteenth century at best. The problem, however, is more apparent than real because the territorial distribution of Catholicism and Protestantism was essentially frozen within Europe by the end of the seventeenth century, as we explain in the next subsection. Because the religious distribution has been highly stable after that time, the difference between gradualist and initial impact views is moot. We can use nineteenth-century figures to represent the largely unchanging distribution of religious faiths in European countries from a time preceding the onset of industrialization.

#### THE DISTRIBUTION OF RELIGIOUS FAITHS IN POST-SEVENTEENTH-CENTURY EUROPE

The Treaties of Westphalia that concluded the Thirty Years War fixed religious boundaries within northern and central Europe in 1648. The revocation of the Edict of Nantes in France in 1685, which withdrew political guarantees that the Huguenots had enjoyed, and the Edict of Potsdam in the same year, which opened Prussia to them, occasioned the last large intra-European religious migration and marked the end of the expansion of Protestantism in southern Europe. Both the Treaties of Westphalia and the revocation of the Edict of Nantes also terminated mass religious conversions for practical purposes (Shaughnessy [1925] 1969).<sup>9</sup>

Table 1 shows the distribution of Protestants and Catholics at the earliest dates for which data are available, whenever possible from more than one source, to convey a view of the reliability of the data and of the stability of religious distribution over time.<sup>10</sup> For each national unit, the figure in italics is the one used in the analysis. Except for Ireland, the religious distribution appears quite stable over time. France's religious composition was only slightly affected by territorial changes late in the nineteenth century.<sup>11</sup> Finally, the data in Table 1 do not suggest that differential natural increase of Protestants and Catholics greatly affected the religious composition.<sup>12</sup>

**TABLE 1: Religious Composition of Countries (Predominantly Protestant or Catholic, or Both) at the End of the Eighteenth Century; Earliest Estimates Available**

Country	Percent Protestant <sup>a</sup>	Percent Catholic	Date	Source
Sweden	> 99	< .1	ca. 1884	Mulhall 1884
	> 99		19th c.	Shaughnessy 1969
Norway	> 99	< .1	ca. 1884	Mulhall 1884
	> 99		19th c.	Shaughnessy 1969
Denmark	> 99	< 1	1860	Statesman's 1871
	> 99	.1	ca. 1884	Mulhall 1884
Finland	98	1 to 2	1858	Statesman's 1867
	> 98	> 1	1899	Mulhall 1899
United Kingdom <sup>a</sup>	82	> 17	1871	Mulhall 1892
Great Britain <sup>b</sup>	91	8 to 9	1867	Statesman's 1868
	91	8	1869	Statesman's 1871
	94	5	1877	Statesman's 1879
	94.5	5	1871	Mulhall 1892
	95	< 5	ca. 1884	Mulhall 1884
England & Wales	> 95	4.7	1861	Statesman's 1867
	95	4.5	1871	Mulhall 1892
	NA	3	19th c.	Shaughnessy 1969
Germany	62	36 to 37	1871	Statesman's 1879
	63	36	ca. 1884	Mulhall 1884
	63	36	ca. 1892	Mulhall 1892
	63	36	1890	Mulhall [1880] 1890
Netherlands	61	38	1849	Statesman's 1867
	62	37	ca. 1865–70	Statesman's 1871
	62.5	37	ca. 1884	Mulhall 1884
	63	36.5	ca. 1892	Mulhall 1892
	62	36	1890	Mulhall 1892
	NA	35	19th c.	Shaughnessy 1969
Switzerland	58	41	1860	Statesman's 1867
	59	41	1870	Statesman's 1879
	59	41	ca. 1884	Mulhall 1884
	59	41	1890	Mulhall 1892
	NA	35 to 40	19th c.	Shaughnessy 1969
Ireland <sup>c</sup>	12	88	1834	Statesman's 1864
	18	82	1840	Shaughnessy 1969
	22	77.5	1861	Statesman's 1867
	24	76	1871	Statesman's 1879
	23	76.5	1871	Mulhall 1892
	23	77	1881	Mulhall 1884
	23	77	1890	Mulhall 1892
	NA	74	1900	Shaughnessy 1969

TABLE 1: Religious Composition of Countries (Predominantly Protestant or Catholic, or Both) at the End of the Eighteenth Century; Earliest Estimates Available

Country	Percent Protestant <sup>a</sup>	Percent Catholic	Date	Source
Austria-Hungary	NA	73	1830–50	Shaughnessy 1969
	10	79	1857	Statesman's 1867
	<i>10</i>	77	1870	Statesman's 1871
	10	81	ca. 1884	Mulhall 1884
	9.5	78.5	ca. 1892	Mulhall 1892
	9	78	1890	Mulhall 1899
	NA	67	1860–90	Shaughnessy 1969
Austrian Crown	< 2	> 91	ca. 1892	Mulhall 1892
	< 2	91	1890	Mulhall 1892
Hungarian Crown	<i>20</i>	60	ca. 1892	Mulhall 1892
France	4	95	1862	Statesman's 1867
	1.5	98	ca. 1884	Mulhall 1884
	> 2	97.5	ca. 1892	Mulhall 1892
	2 to 3	97	1890	Mulhall 1892
	NA	90	19 <sup>th</sup> c.	Shaughnessy 1969
Belgium	NA	95	1830–1900	Shaughnessy 1969
	< <i>1</i>	> 99	1864	Statesman's 1867
	.2	> 99	ca. 1884	Mulhall 1884
	< 1	> 99	1890	Mulhall 1892
Italy	NA	97	1830–1900	Shaughnessy 1969
	< 1	> 99	1871	Statesman's 1879
	.2	> 99	ca. 1884	Mulhall 1884
	< 1	> 99	1890	Mulhall 1892
Portugal	NA	97	1830–1900	Shaughnessy 1969
	< <i>1</i>	> 99	ca. 1870	Statesman's 1870
	.1	> 99	ca. 1884	Mulhall 1884
	< 1	> 99	1890	Mulhall 1892
Spain	NA	97	1830–1900	Shaughnessy 1969
	< 1	> 99	1867	Statesman's 1869
	< . <i>1</i>	> 99	ca. 1884	Mulhall 1884
	< 1	> 99	1890	Mulhall 1892

Notes: Earliest estimates available. Estimates used for analyses are in italics.

<sup>a</sup> United Kingdom refers to England, Wales, Scotland, and Ireland.

<sup>b</sup> Great Britain refers to England, Wales, and Scotland.

<sup>c</sup> Includes Ulster.

The situation in Great Britain and in Ireland was somewhat more complicated. While there has been substantial variation over time in the public acceptance of Catholicism in these areas, variation in the degree of repression does not seem to have caused major fluctuations in actual religious composition.<sup>13</sup> Ireland is the only territorial entity that experienced a substantial change in religious composition during the nineteenth century. According to different estimates in Table 1, the percentage of Catholics in Ireland may have dropped by as little as 4 points between 1840 and 1861 (comparing Shaughnessy [1925] 1969 and *Statesman's* 1867) or as much as 10 points between 1834 and 1861 (comparing *Statesman's* 1864 and 1867). This period encompasses the great potato famine of the 1840s which, affecting as it did the predominantly Catholic tenants, led directly to massive Catholic emigration and has had lingering effects to this day by establishing an emigration pattern among the Irish (Mokyr 1980). Correspondingly, the Protestant minority in Ireland may have nearly doubled during the nineteenth century, although assigning a lower, pre-emigration figure for the percentage of Protestants in Ireland does not change the substance of our findings.<sup>14</sup>

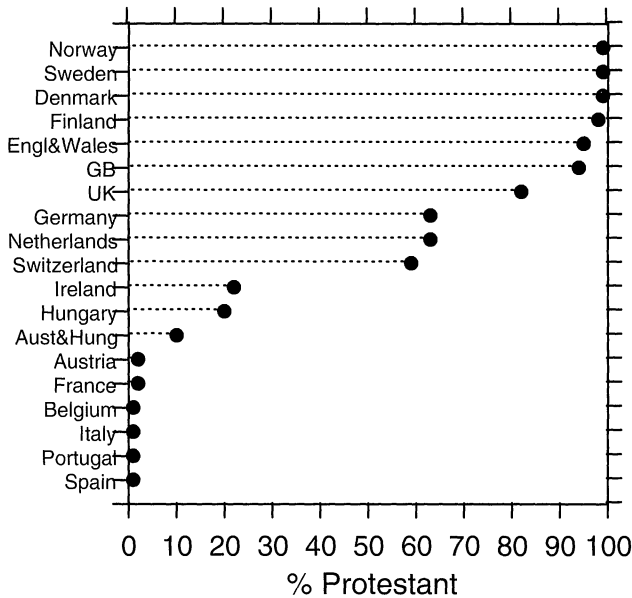
The overall stability of the distribution of Protestants and Catholics in Europe since the end of the seventeenth century entails that the nineteenth-century percentages in Table 1 are nearly perfect proxies for late eighteenth-century figures. The design of the study therefore allows us to estimate the effect of the level of Protestant strength on capitalist development over a time span of at least a century. This holds even if one discounts completely the iron cage argument discussed above.

#### UNITS OF ANALYSIS

The national units included in the data set are determined in accordance with both Weber's explicit comparison of Protestant and Catholic mind-sets in relation to the emergence of capitalism, and practical considerations of data availability and historical continuity over the period of interest. They consist of European countries with populations that were predominantly Protestant and/or Catholic at the time of the onset of industrial capitalism by the middle of the eighteenth century, *and* that were part of the first wave of development of industrial capitalism, extending roughly to the end of the nineteenth century. They are Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland.<sup>15</sup> For reasons of data availability, we include the Austrian-Hungarian Empire, instead of Austria and Hungary separately, in some of the analyses; we also use variant territorial definitions for Great Britain, using the following terminology consistently after Mitchell (1975, 1992): Great Britain (England, Wales, and Scotland), England and Wales (excluding Scotland), or the United Kingdom (Great Britain plus Ireland).<sup>16</sup>

Figure 1 shows the national units ordered by descending percentage of Protestants. The percentage of Protestants shows considerable variation, ranging from close to zero (Austria, France, Belgium, Italy, Portugal, and Spain) to almost

FIGURE 1: Percentage of Protestants in European Countries That Were Predominantly Protestant and/or Catholic at the End of the Eighteenth Century



Note: Earliest estimates available (see Table 1). Countries are listed by decreasing percentage of Protestants from top to bottom. National units pertaining to the United Kingdom and the Austro-Hungarian Empire are not exclusive.

100 (Finland, Denmark, Sweden, and Norway), with three highly heterogeneous cases (Switzerland, Netherlands, and Germany) that have values about 60. We will maintain the order of units shown in Figure 1 in all the graphical displays in the article.

#### DEPENDENT VARIABLES: DIMENSIONS OF INDUSTRIAL CAPITALISM

Weber gave clear indications in *Protestant Ethic* (1958) and elsewhere (1961; see also Gerth & Mills [1946] 1958) that the historical episode he was investigating was the “historically unique” . . . “modern industrial” capitalism and not any of its earlier “merchant” or “adventurer” forerunners. Most proponents of and commentators on the Common Interpretation also treat modern industrial capitalism as the specific object of interest (Martinelli & Smelser 1990; Morishima 1990; Tawney [1922] 1962). The general hypothesis associated with the Common Interpretation is that a large proportion of Protestants should facilitate the development of industrial capitalism in a country. In this view, modern industrial



TABLE 2: Percentage of Protestants and Measures of Industrial Capitalism

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Norway	99	100	3	104	1881	1819	4493	1959	8	44	1891	56	24	1850	102	91	21
Sweden	99	140	5.3	60	1863	1863	16710	1938	10	68	1870	63	10	1850	146	99	17
Denmark	99	230	11.6	209	1808	1808	5294	1930	15	55	1870	57	27	1850	127	128	25
Finland	98	—	—	—	1912	1912	5864	1939	8	45	1880	72	11	1866	218	153	30
England and Wales	95	—	—	—	—	—	—	—	—	—	—	—	—	1850	162	154	25
G.B.	94	—	—	—	1812	1773	32846	1928	66	92	1871	20	49	—	—	—	—
U.K.	82	300	24	56	—	—	—	—	—	—	—	—	—	—	—	—	—
Germany	63	160	5	—	1820	1820	61940	1939	30	83	1882	43	39	1851	287	220	45
Netherlands	63	240	4.5	27	1876	1631	3677	1930	39	75	1874	39	31	1850	169	155	22
Switzerland	59	150	6	158	1850	1850	5249	1937	27	75	1890	46	37	1871	222	150	26
Ireland	22	—	—	—	1799	1799	—	—	—	—	1871	54	15	1864	98	109	37
Hungary	20	—	—	—	—	—	10307	1961	—	—	1869	70	10	1852	229	223	50
Austria and																	
Hungary	10	105	3.8	65	—	—	22981	1913	27	84	—	—	—	—	—	—	—
Austria	2	—	—	—	1771	1771	6742	1948	—	—	1869	65	19	1850	251	231	41
France	2	240	7	59	1807	1807	42600	1935	36	89	1866	51	29	1850	146	160	39
Belgium	1	170	5	40	1801	1801	5145	1934	56	89	1866	45	40	1850	141	172	41
Italy	1	95	3.6	46	1808	1913	23158	1934	29	71	1871	61	21	1863	232	174	51
Portugal	1	90	2.2	—	1901	1901	3597	1952	20	60	1890	68	19	—	—	—	90
Spain	1	150	2.8	2	1831	1885	18187	1952	30	73	1877	72	13	1858	175	204	51

TABLE 2: Percentage of Protestants and Measures of Industrial Capitalism

Key to column headings:

1. Percentage of Protestants in total population
2. Total wealth per capita 1890 (pounds sterling)
3. Total bank deposits per capita 1890 (pounds sterling)
4. Savings banks deposits per capita 1890 (shillings)
5. Year of founding of principal stock exchange — preferred
6. Year of founding of principal stock exchange — pro-CI
7. Maximum extension of railroads network (km)
8. Year of maximum extension of railroads network
9. Extension of railroads network 1870 (percentage of maximum)
10. Extension of railroads network 1900 (percentage of maximum)
11. Year of measurement of male labor force distribution circa 1870
12. Percentage of male labor force in agriculture circa 1870
13. Percentage of male labor force in industry circa 1870
14. Year of measurement of infant mortality circa 1850
15. Infant mortality (per 1,000 live births) circa 1850
16. Infant mortality (per 1,000 live births) 1900
17. Infant mortality (per 1,000 live births) 1955

Sources: See text

TABLE 3: Dates of Founding of Stock Exchanges

Country	Location	Date	Event
Norway	Oslo	<u>1819</u>	"Foundation" (no further detail)
		<u>1881</u>	Quotation of shares
Sweden	Stockholm	<u>1863</u>	"Foundation" (no further detail)
		<u>1919</u>	Inauguration of laws regarding securities trading and Stock Exchange activities
Denmark <sup>a</sup>	Copenhagen	<u>1808</u>	Ordinance on Broking of 22 December 1808; Copenhagen Chamber of Commerce becomes supervisor of trading and publishing prices
		<u>1919</u>	First statute on Broking enacted
Finland	Helsinki	<u>1912</u>	"Foundation" (no further detail)
Great Britain	London	<u>1773</u>	Adoption of name "Stock Exchange"
		<u>1812</u>	Exchange's Deed of Settlement: elaboration of first formal rules
Germany <sup>b</sup>	Frankfurt	<u>1585</u>	"Foundation"; trading in exchange bills and foreign currency
		<u>1820</u>	First listing of shares
		<u>1896</u>	Stock Exchange Law established
Netherlands	Amsterdam	<u>1631</u>	Trading in securities
		<u>1796</u>	Publication of stock prices begins (Neal 1990)
		<u>1876</u>	Foundation of Amsterdam Stock Exchange as a private association <sup>c</sup>
Switzerland <sup>d</sup>	Geneva	<u>1850</u>	Foundation by 24 stockbrokers
Ireland	Dublin	<u>1793</u>	Formation of voluntary association of stock brokers
		<u>1799</u>	Association becomes Dublin Stock Exchange; Act regulating stock brokers

capitalism (1) possesses individual psychological and behavioral correlates; (2) has specific institutional requirements as well as infrastructural ones; and (3) produces certain social consequences. The Common Interpretation implies that the proportion of Protestants in the population of a country should be associated with these dimensions of modern industrial capitalism. Measures of these dimensions are presented in Table 2 and discussed in this section.

### *Wealth and Savings*

A major consequence of the rise of industrial capitalism has been a tremendous increase in the productivity of labor and therefore an increase in average wealth. We use two indicators of wealth. One measure is *Wealth per capita* (pounds sterling) in 1890, and the other *Total bank deposits per capita* (pounds sterling) in 1888. The

TABLE 3: Dates of Founding of Stock Exchanges

Austria	Vienna	<u>1771</u>	Foundation by Imperial decree and opening
France	Paris	<i>1141</i> <u>1807</u>	Centralization of trading in letters of credit by Louis VII Napoleon commercial code; Paris Exchange granted monopoly of stock trading
Belgium <sup>c</sup>	Brussels	<u>1801</u>	Foundation by decree under French occupation
Italy <sup>f</sup>	Milan	<i>1808</i> <u>1913</u>	Foundation by decree of Vice-Roy Eugene Napoleon Basic law governing Italian Stock Exchange
Portugal	Lisbon	<u>1901</u>	First regulation of Lisbon Stock Exchange
Spain <sup>g</sup>	Madrid	<i>1831</i> <u>1885</u>	Foundation by decree Commercial code defining transactions and responsibilities of brokers

Notes: The preferred date is italicized, and the pro-Common Interpretation date is underlined. Occasionally they are the same.

<sup>a</sup> The earlier Ordinance on Commerce (1681) and Brokers' Articles (1684) affected dealing in securities, but these were occasional activities.

<sup>b</sup> None of the other German locations (Hamburg, Berlin, Bremen) list earlier trading in stocks.

<sup>c</sup> This event implies existing rules, but no rules or laws are mentioned for an earlier date.

<sup>d</sup> The Zurich Stock Exchange was opened later (1877).

<sup>e</sup> Trading in stocks may have been taking place as early as the thirteenth (Bruges) or fifteenth (Antwerp) centuries.

<sup>f</sup> Milan handles 90% of total equity volume in Italy; other exchanges share the remaining 10%.

<sup>g</sup> The modern Barcelona Stock Exchange was founded in 1919 but may have antecedents going back to 1251.

Source: *The Directory of World Stock Exchanges* (1988) unless otherwise indicated.

Common Interpretation claims that the Protestant ethic facilitated the accumulation of wealth by promoting frugality. We use *Savings bank deposits per capita* (shillings) in 1890 to measure the propensity to save, an aspect of frugality. We will further discuss the conceptual relationships between these variables in conjunction with the results. The data are from Mulhall (1892, 1899). The three variables are presented in columns 2, 3, and 4 of Table 2.

### *Institutionalization of Stock Trading*

The second set consists of two alternative measures of the *Year of founding of the stock exchange*, taken as an institutional indicator of the development of industrial capitalism. According to Gerth & Mills ([1946] 1958), Weber viewed the highest stage of capitalism as the separation of ownership from management, as manifested in the public sale of shares in enterprises. Elsewhere, Weber (1961) specifically

mentioned stock exchanges as signaling a capitalist economy. Weber's view is in line with current mainstream conceptualizations of modern capitalism, such as the discussion in the *Encyclopaedia Britannica* (1991) of "stock," "stock exchange," and "Financial markets — The development of stock exchanges," which hold that the anonymous and extensive mobilization of public, nonstate financial resources toward private gain is the single most important feature differentiating modern capitalism from its various antecedents (also see Samuelsson ([1957] 1993).

Historically, institutionalization of stock trading took two forms. In the first, the most common, legislation was enacted regulating share brokering. This was usually done in connection with preexisting exchange locations. Thus, the Barcelona stock exchange was created by 1915 legislation applied to a commodities market in continuous existence since 1251 that originally specialized in cross-Mediterranean trade. In Paris and Brussels, a pre-existing practice was regularized through the awarding of a legal monopoly to a sole exchange location, a method commonly used to facilitate state oversight (*Directory of World Stock Exchanges* 1988). In the less common but better known second form, exemplified by the case of Great Britain, the actors in a de facto market formally adopted their own rules without state intervention. A similar process took place in the case of the Frankfurt exchange. Both forms of institutionalization, legislation and the formal adoption of self-regulation, satisfy Weber's (1958) insistence on "rational structures of law and administration" as principal contributors to the calculability of economic action specific to capitalism. Weber, and by implication the Common Interpretation, would predict a positive association between Protestantism, on the one hand, and an early date of institutionalization of stock trading, on the other.

Dating the institutionalization of stock trading requires substantive judgment in some cases. Candidate dates are shown in Table 3. We used two alternative sets of dates in the analysis. The first set (italics in Table 3) is preferred on theoretical grounds: It consists of the date of first adoption of formal rules regulating stock trading or, when this information is lacking, the date of first listing or sales of stocks.<sup>17</sup> Events pertaining to bonds — that is, debt — are explicitly excluded in accordance with the view of Weber (and of everyone else) that there is, at best, no particular association between debt and capitalism. The coding of this first set of dates is religion blind. The second date (underlined in Table 3) is the earliest possible date for more Protestant countries and the latest possible date for more Catholic countries mentioned by any credible source. The coding of this second set of dates therefore allocates the benefit of any doubt systematically to the Common Interpretation. This second coding results in differential coding for Norway, Great Britain, Netherlands, Italy, and Spain.<sup>18</sup> The two dates are also shown in columns 5 and 6 of Table 2.

*Development of Railroads*

The third set of measures pertains to the development of railroads. Checkland (1964) stressed the dual role of railroads as massive users of capital and as generators of other industries: "The railway has been the classic capital user of all times" and "Coal mining and iron manufacturing responded with mounting output" (24) and further, "Railroad iron is a magnificent rod in its power to evoke the sleeping energies of land and water" (25). Weber (1961) himself viewed the railroad as both an instrument and a consequence of capitalist development. Other students of capitalism, representing extremely varied viewpoints, have emphasized the importance of railroads as hallmarks of industrial capitalism (Bairoch 1965; Kuznets 1966; Lenin 1917; Mandel 1975). Deane (1976) recounts how, in Britain, the railroad dramatically lowered transportation costs, permitting new economies of scale by enlarging markets, and stimulated demands in other key industries such as iron and coal. Cafagna (1976) makes similar points with respect to the industrialization of Italy. Chandler (1977) presents railroad companies as exemplary organizational forms of modern capitalism.<sup>19</sup>

Straightforward measures of railroad development, such as length of railroad track per capita, are inappropriate for comparative study, since the extensiveness of a national railroad network is influenced by a number of physical and human ecological factors unrelated to the progress of capitalism (Bairoch 1965). For example, to serve exactly the same economic functions, a railroad network will have to be more extensive when serving a larger, sparsely settled area than when serving a smaller, densely populated area. To control for these idiosyncratic factors, the chosen measure of railroads development is the extension of the railroad network, in 1870 and in 1900, *expressed as a percentage of the maximum extension of the network*, which was achieved for all countries, with one exception, between 1928 and 1959.<sup>20</sup> This measure of railroads development permits cross-national comparisons. The Common Interpretation would predict that, at a given date, the railroads network in more Protestant countries should have achieved a higher percentage of what would eventually become its maximum extension than in their more Catholic counterparts. The railroads data are from Mitchell (1992). The maximum extension of the railroads network, the year in which maximum extension was achieved, and the extension in 1870 and 1900 as percentages of maximum extension are shown in columns 7 to 10 of Table 2.

*Sectoral Distribution of the Labor Force*

Industrial development has been historically accompanied by major shifts in the distribution of the labor force into primary (extractive), secondary (industrial),

TABLE 4: Association between Percentage Protestant and Selected Variables

Variable	Measure of Association	Coef.	P-value (one-tailed)	N	Controlling for:
Wealth/Cap.	Spearman	.270	.186	13	
	Pearson	.306	.155	13	
Bank deposits/Cap.	Spearman	.489*	.045	13	
	Pearson	.411	.082	13	
Savings/Cap.	Spearman	.630 *	.019	11	
	Pearson	.551 *	.040	11	
	Std. Coef.	.569 *	.048	11	Wealth/Cap.
Founding of stock exchange (preferred)	Spearman	.364	.091	15	
	Pearson	.424	.058	15	
Founding of stock exchange (pro-CI)	Spearman	-.129	.323	15	
	Pearson	-.124	.330	15	
Railroads extension, 1870	Spearman	-.491*	.037	14	
	Pearson	-.316	.136	14	
Railroads extension, 1900	Spearman	-.428	.063	14	
	Pearson	-.464*	.047	14	
Male LF in agriculture	Spearman	-.196	.233	16	
	Pearson	-.287	.141	16	
	Std. Coef.	-.334	.120	16	Year
Male LF in industry	Spearman	.009	.487	16	
	Pearson	.156	.282	16	
	Std. Coef.	.158	.278	16	Year
Infant mortality, 1850	Spearman	-.327	.117	15	
	Pearson	-.201	.236	15	
	Std. Coef.	-.185	.260	15	Year
Infant mortality, 1900	Spearman	-.701**	.002	15	
	Pearson	-.578*	.012	15	
Infant mortality, 1955	Spearman	-.853**	.000	16	
	Pearson	-.712**	.001	16	

\*  $p < .05$     \*\*  $p < .01$  (one-tailed tests)

and tertiary (services) sectors of production.<sup>21</sup> Accordingly, measures of the distribution of the labor force among sectors, such as the percentage of the labor force in agriculture, have been commonly used as indicators of development in cross-national comparative research (e.g., Meyer & Hannan 1979). We use as measures of industrial development the *percentage of the male labor force in agriculture* and the *percentage of the male labor force in industry*, both circa 1870 and in 1900. We look at both sectors because the distribution of the labor force in the residual category (commerce, services, and other) is not uniform across countries,

so that the percentage of the labor force in industry is not simply the complement of the percentage in agriculture.<sup>22</sup> We focus on males, rather than on the entire labor force, because there seems to be more variation, across countries and over time, in nineteenth-century classifications of occupations of women than of men, although measures based on the entire labor force are highly correlated with measures based on the male labor force, and generally stand in the same relationships with percentage of Protestants. The Common Interpretation predicts that, in a given year, more Protestant countries should have lower percentages of the male labor force in agriculture and higher percentages in industry. Data are from Mitchell (1992).<sup>23</sup> The year of measurement of the labor force distribution circa 1870, percentage male labor force in agriculture, and percentage male labor force in industry are shown in columns 11, 12, and 13 of Table 2.

### *Infant Mortality*

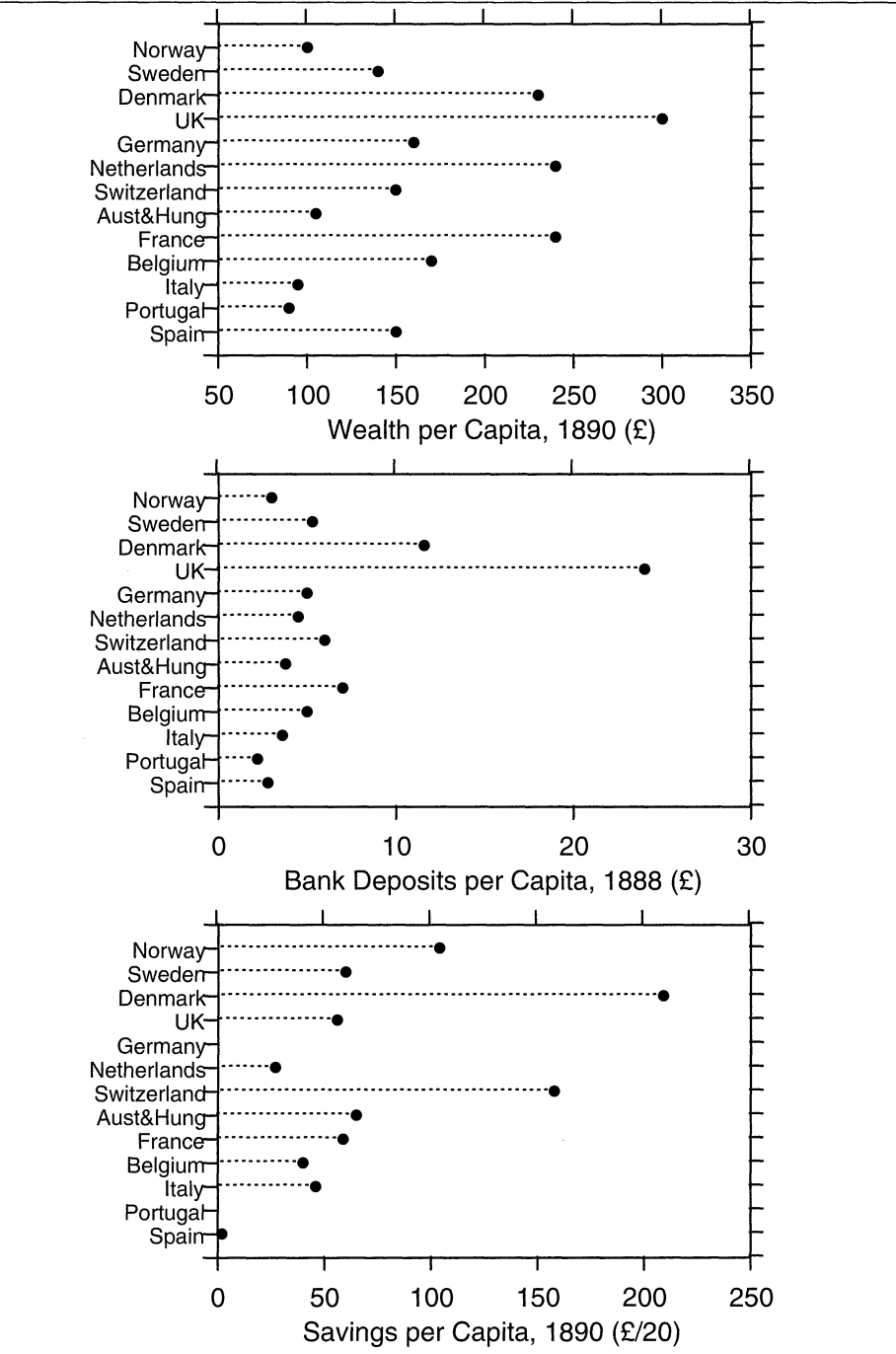
The last variable measures an important long-term social consequence of industrial capitalism: the decline in infant mortality. The general increase in productivity marking the development of industrial capitalism was accompanied by an amelioration in human welfare, a trend eloquently described, perhaps surprisingly, by Karl Marx and Friedrich Engels ([1848] 1954) in their *Communist Manifesto*. This improvement of human welfare constitutes an important component of the ethical justification of capitalism. It is also a focus of interest for many versions of the Common Interpretation, including modernization theory. Among dimensions of human welfare, few are less controversial than infant mortality, since the desire of parents to see their children survive transcends philosophical and cultural differences. We use *infant deaths per 1,000 live births* (circa 1850, in 1900, and in 1955), where “infant” is defined as a child under one year of age, as a negative indicator of the overall social progress that is universally attributed to industrial capitalism. The infant mortality data are from Mitchell (1992). The year of measurement of infant mortality circa 1850 and the mortality figures circa 1850, in 1900, and in 1955 are shown in Table 2, columns 14 to 17.

### METHODS

We investigate the bivariate relationships between the percentage of Protestants and the various dimensions of industrial capitalist development using simple graphical analyses comparing the values of each dimension for the national units ordered in decreasing order of Protestantism (Cleveland 1994). We estimate the strength of each bivariate relationship with both the Pearson (product-moment), and the Spearman (rank-order) correlation coefficients. Spearman rank correlation is a robust alternative to the Pearson coefficient that is also insensitive to measurement discrepancies small enough to leave the rank of a country relative to others unaffected.<sup>24</sup> We test for the significance of the Spearman correlation coefficient



FIGURE 2: Measures of Wealth and Savings



Note: Countries are listed by decreasing percentage of Protestants, from top to bottom.

using the procedure described by Iman (1994). For dimensions of development measured in different years for different national units, we estimate the effect of Protestantism on the dimension as the standardized coefficient of Protestantism in the multiple regression of the dimension on Protestantism and the year of measurement.<sup>25</sup> The standardized coefficient is in the same metric as the simple Pearson correlation coefficient and can therefore be readily compared to it.

Because the Common Interpretation makes strong directional predictions concerning the association of Protestantism with the dimensions of development, we use one-sided tests of the significance of the relationships. This strategy enhances the likelihood of discovery of significant relationships, and therefore favors the Common Interpretation, since one-sided tests are easier to satisfy than two-sided ones.

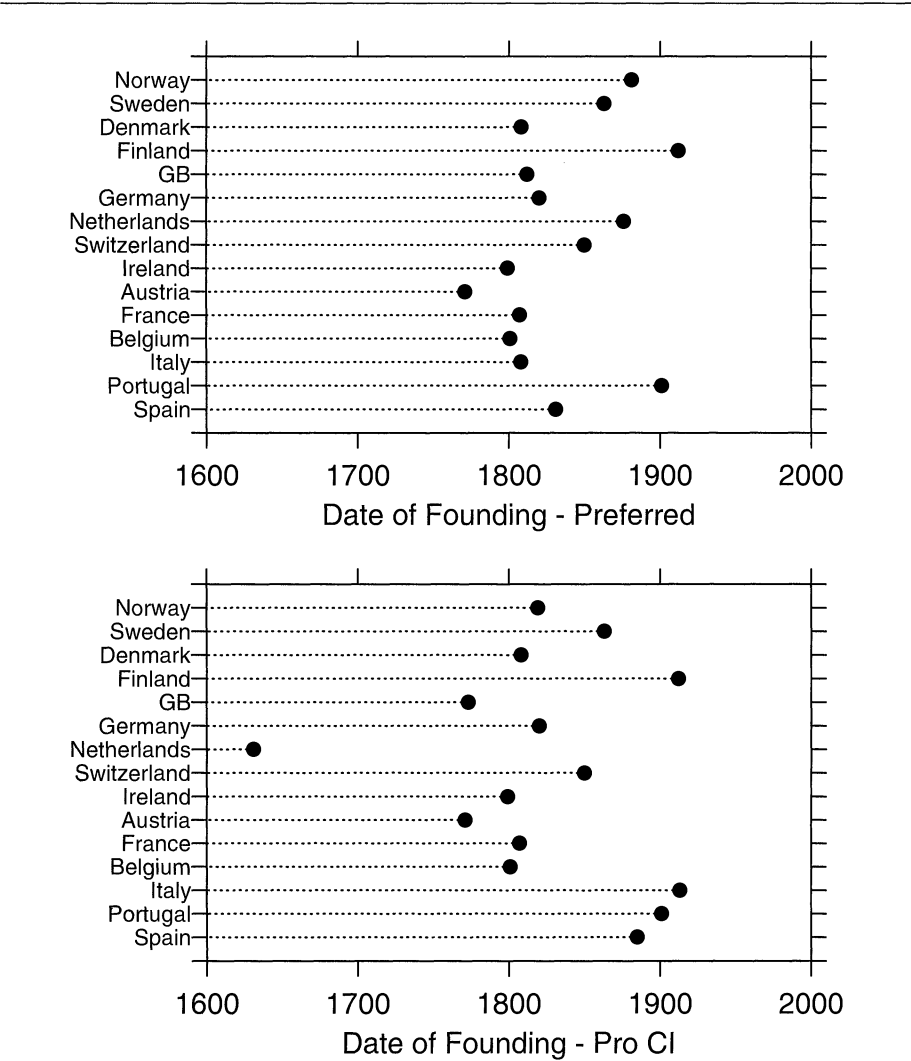
## Results

### WEALTH AND SAVINGS

One consequence of industrial capitalism has been a great rise in the productivity of labor and a resulting increase in average wealth. The Common Interpretation thus predicts that the larger the proportion of Protestants in the population, the richer the country. The top panel of Figure 2 shows wealth per capita as it stood in about the last decade of the nineteenth century; the national units are arranged along the vertical axis in declining order of Protestantism, from Norway at the top to Spain at the bottom. A strong association between Protestantism and wealth would produce a visible alignment of the dots in the graph from bottom left to top right. This is clearly not the case here. Scanning the graph from right to left shows that the United Kingdom has the highest value of wealth, consistent with its high level of industrialization, followed by France, the Netherlands, and Denmark. These wealthy countries span the whole range of Protestant values, from maximum (Denmark) to almost minimum (France). Scanning from left to right from the poorest to the wealthiest, we see that the poorest countries also span the whole range of the religious dimension, from Protestant Norway to Catholic Italy. Table 4 presents the correlation estimates. Consistent with the visual impression in Figure 2, the Pearson correlation of Protestantism and wealth (.306), although positive, is not significant at the .05 level. The Spearman correlation (.270) is likewise nonsignificant. Therefore, the hypothesis of an association between Protestantism and wealth is not supported by the data. Toward the end of the nineteenth century, Protestant countries are not significantly wealthier than Catholic ones.

The measure of wealth includes land values. An alternative, and perhaps better indicator of the kind of wealth associated with industrial capitalism, is the total value of deposits in banks. The central panel of Figure 2 shows bank deposits per capita in 1890. The United Kingdom again ranks number one, with a figure more

FIGURE 3: Founding of Principal Stock Exchange (Preferred and Pro-Common Interpretation Dating)

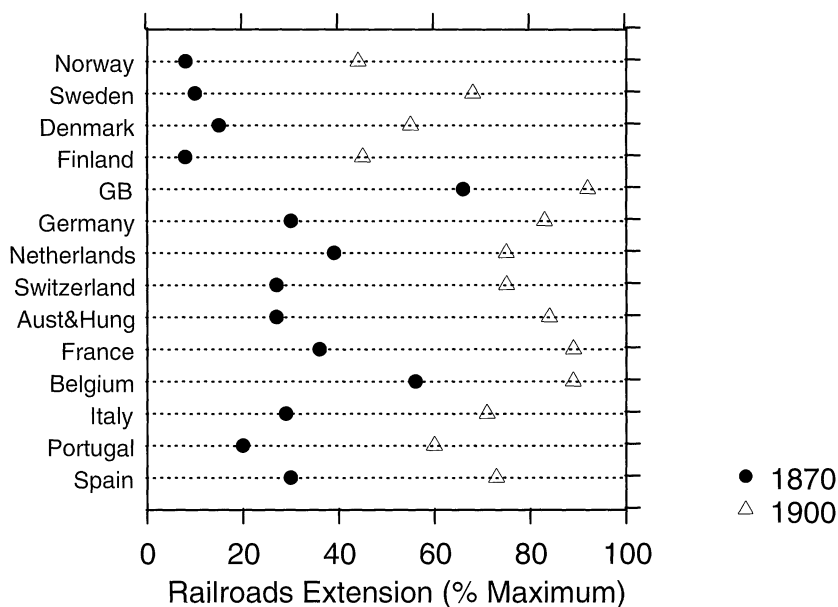


*Note:* Countries are listed by decreasing percentage of Protestants from top to bottom.

than twice that of Denmark, in second position. The disproportionate advantage of the United Kingdom is consistent with the view that that country at the end of the nineteenth century is reaping all at once the benefits of early industrialization, of the empire, and of its position as banker to the world. Again, there is no compelling visual clue in Figure 2 of a strong relationship between Protestantism and bank deposits per capita. While the second runner is Protestant Denmark, the distant third is Catholic France. On the other end of the spectrum, while Catholic Portugal and Spain occupy the lowest positions in the bank deposits ranking, Protestant Norway is next lowest. The nonsignificant Pearson correlation coefficient (.411) in Table 4 confirms this impression, but the Spearman correlation (.489) is positive and significant at the .05 level, providing partial support for the existence of an association between Protestantism and bank deposits per capita.

The Common Interpretation implies that a large proportion of Protestants is associated with a high propensity to save (i.e., frugality). The third financial measure consists of deposits *in savings banks* specifically, measured per capita, in 1890. This quantity bypasses expressions of corporate behavior and may be a better expression of the kind of individual thriftiness that is at the heart of the Common Interpretation. The data are shown in the lower panel of Figure 2. In this case, the visual impression of a trend of low savings in Catholic countries, versus high savings in Protestant countries, is stronger. Protestant Denmark is in first place, and the second slot is occupied by Switzerland, a country with a Protestant majority. There is a weak tendency in the remaining countries for Protestantism to be associated with higher levels of savings, although discrepancies, such as the relatively low value for the Netherlands, are present. Both the Pearson (.551) and the Spearman (.630) correlation coefficients are significant at the .05 level (Table 4). Therefore, the Common Interpretation prediction of an association between Protestantism and the propensity to save is not rejected statistically.

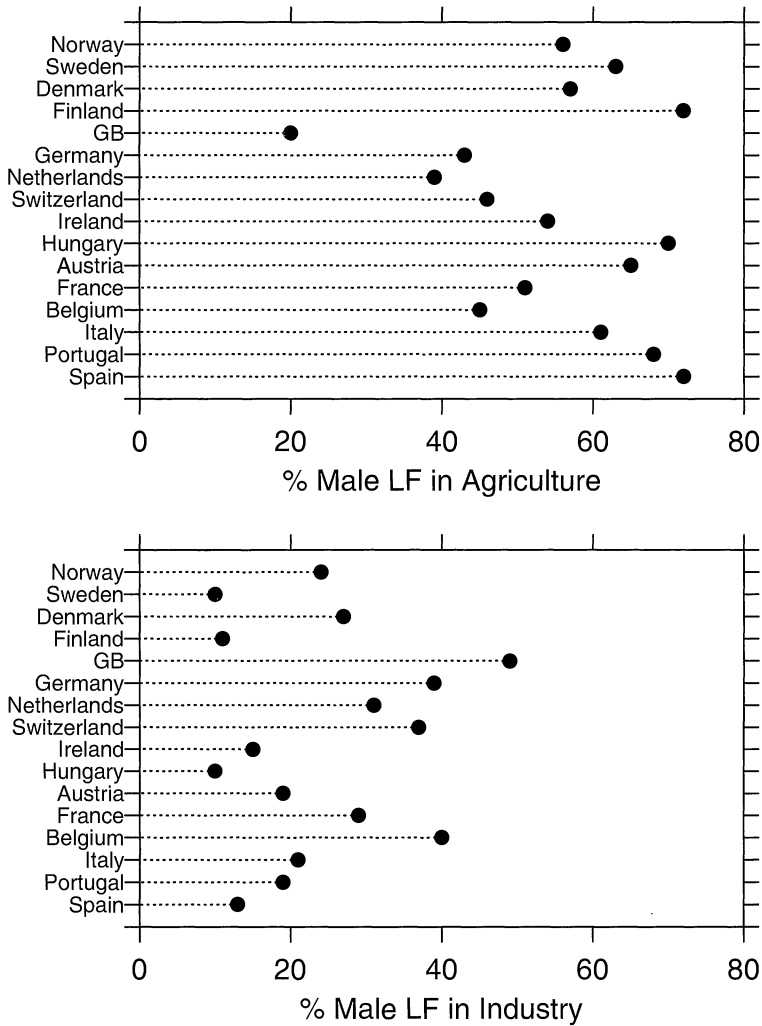
A cautious approach might argue that the propensity to save must be constrained by the general level of prosperity, as well as reflecting norms of frugality associated with the Protestant ethic, since a wealthy population should be able to save more than a poor one, other factors being equal. Therefore, according to the Common Interpretation, the propensity to save should be positively associated with Protestantism even when controlling for the constraint on savings constituted by the level of wealth. To test this possibility, we also measure the association of Protestantism with savings as the standardized coefficient of Protestantism in the regression of savings on Protestantism and wealth per capita. Table 4 shows that the coefficient of Protestantism (.569) is similar to the simple bivariate correlation (.551), and also significant at the .05 level. Therefore, the relationship between Protestantism and the propensity to save seems to hold irrespective of the variation in prosperity among countries.

**FIGURE 4:** Extension of Railroads Network as Percentage of Maximum Extension, 1870 and 1900

*Note:* Countries are listed by decreasing percentage of Protestants from top to bottom.

These results add up to a mixed conclusion with respect to the Common Interpretation. At the end of the nineteenth century, Protestant countries exhibit a significantly greater propensity to save than Catholic countries, especially as measured by deposits in savings banks, and even controlling for the level of wealth. However, when wealth is measured in such a way as to include the value of land, Protestant countries are no richer than Catholic countries. The high propensity to save of some Protestant countries, including a very poor one such as Norway, supports psychological descriptions of Protestant frugality and thriftiness. However, the data do not support the link that the Common Interpretation assumes to exist between individual psychological propensities and collective performance, since the most comprehensive measure of aggregate economic performance (total wealth) does not indicate the Protestant advantage that would certainly be expected by the Common Interpretation at that late date.

FIGURE 5: Percentage of the Male Labor Force in Agriculture and in Industry, circa 1870.



Note: Countries are listed by decreasing percentage of Protestants from top to bottom.

## INSTITUTIONALIZATION OF STOCK TRADING

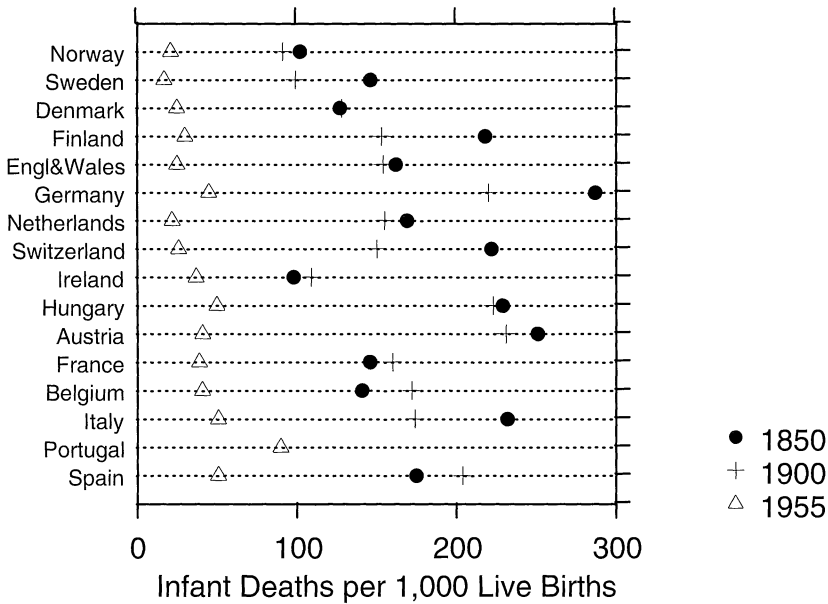
As Table 4 shows, the Pearson correlation of Protestantism and the theoretically preferable date of founding of the principal stock exchange is positive (.424), suggesting that the more Protestants in a country, the *later* the stock exchange was opened, a pattern opposite of that predicted by the Common Interpretation. The Spearman correlation (.364) is also positive. Neither correlation coefficient, however, reaches significance at the .05 level. Correlations of Protestantism with the date of founding chosen to favor the Common Interpretation turn negative (-.129 and -.124 for the Spearman and Pearson coefficients, respectively) but are nowhere near significance.

Figure 3 (top) reveals the pattern underlying the small positive correlation of Protestantism with the preferred date of founding. Scanning the graph from left to right, and disregarding for a moment Spain and Portugal, it appears that Catholic countries tended to open their stock exchange earlier than Protestant countries. The earliest dates correspond to Catholic Austria, Ireland, and Belgium, and some of the latest correspond to Protestant Finland and Norway. However, the late dates for Spain and Portugal break down this rather strong association between Protestantism and a late date of founding of the stock exchange. Recoding some of the founding dates to favor the Common Interpretation (as in the bottom panel of Figure 3) only blurs this pattern without reversing it. A conservative interpretation is that factors other than the religious composition must mainly account for differences among countries in the time of institutionalization of stock trading. A more radical interpretation, based on the theoretically more justified dates and discounting the cases of Spain and Portugal, might claim that a factor or factors associated with Catholicism actually *promote* the early institutionalization of modern capitalism as expressed by the establishment of stock exchanges. In any case, no support whatsoever for the Common Interpretation is to be found in the stock exchanges data.

## DEVELOPMENT OF RAILROADS

Figure 4 shows the extension of the national railroads networks in 1870 and in 1900, measured as a percentage of the maximum extension, for reasons discussed above. In 1870, mostly Protestant Great Britain and Catholic Belgium are the clear leaders of railroads development, while the four Protestant Nordic countries (including Finland) are lagging behind. The visual impression is consistent with the *negative*, although nonsignificant, Pearson correlation of -.316 between Protestantism and railroads extension (see Table 4). By 1900 many countries have extended their railroads network considerably relative to 1870. Catholic France has rejoined Great Britain and Belgium in the leading group with close to 90% extension. Norway, Finland, and Denmark are still lagging behind, but Sweden has moved forward to pass Catholic Portugal. Overall, the Pearson correlation

FIGURE 6: Infant Mortality circa 1850, in 1900, and in 1955



Note: Deaths of infants under 1 year of age per 1,000 live births. Countries are listed by decreasing percentage of Protestants from top to bottom.

between Protestantism and the extension of railroads has become stronger in a negative direction, at  $-.464$ , and is now significant at the  $.05$  level in a one-tailed test. In 1900, then, the greater the proportion of Protestants, the more *belated* the extension of railroads. In other words, Catholicism is associated with quicker progress toward completion of the maximal railroads infrastructure. The Spearman correlations are in the same negative direction, but the pattern of significance is reversed in comparison with the Pearson correlations: the Spearman coefficient is statistically significant in 1870 but not in 1900. The overall pattern is of course the opposite of what would be expected by the Common Interpretation.

#### SECTORAL DISTRIBUTION OF THE LABOR FORCE

The two panels of Figure 5 show the relationships between percentage of Protestants and the percentages of the male labor force in agriculture and in industry, respectively, circa 1870. The proportion of the male labor force in agriculture is a negative indicator of the development of industrial capitalism: the larger the agri-



cultural sector, the less development. In the top panel of Figure 5, the leadership position of Great Britain is again reflected in the smallest percentage of the male labor force in agriculture (20%), while Protestant Finland, Catholic Spain, and mixed Hungary are lagging behind with values around 70%. The bottom panel of Figure 5 shows the percentages of the male labor force in industry. Great Britain is again leading, with 49% of the male labor force in industry, followed by Catholic Belgium (40%), and religiously mixed Germany (39%) and Switzerland (37%). The laggards are mixed Hungary and Protestant Sweden and Finland, with percentages around 10, and Catholic Spain and Ireland (13% and 15%, respectively).

The visual impression from Figure 5 is that there is no strong relationship, if any, between religious composition and the sectoral distribution of the male labor force. The correlations in Table 4 confirm this pattern. While the Pearson correlations between percentages of the male labor force in agriculture and industry are negative ( $-.287$ ) and positive ( $.009$ ), respectively, in directions consistent with the Common Interpretation, neither correlation reaches the .05 significance level. The Spearman correlations exhibit the same pattern. As an additional test, Table 4 also reports the standardized coefficients of the regressions of the labor force figures on Protestantism, controlling for the date of measurement of the labor force figures around 1870. The associations between Protestantism and the male labor force in agriculture and in industry remain nonsignificant in these regression models, suggesting that the variation in the year of measurement does not affect these estimates. We conclude at this point that the relationships predicted by the Common Interpretation between the religious composition and such a widely used and noncontroversial indicator of development as the distribution of the male labor force into agricultural and industrial sectors of production cannot be found, circa 1870. Again, this finding fails to confirm the Common Interpretation.

#### INFANT MORTALITY

Infant mortality data circa 1850 and for 1900 and 1955 are shown in Figure 6. Examining the figures circa 1850 first (circles), one notes the remarkably high mortality values by contemporary standards, up to a maximum of 287 infant deaths per 1,000 live births for Germany. Between a quarter and a third of all newborns died before one year of age in Germany at that time. There is considerable variation in the rates, and the association with the religious composition is not clear. While Protestant Norway and Denmark boast some of the lowest mortality figures (102 and 127, respectively), they are bested by Catholic Ireland, with a low score of 98.<sup>26</sup> Germany has the highest mortality rate, as we saw, followed by Austria (251), Italy (232), Hungary (229), and Switzerland (222). The Pearson and Spearman correlation coefficients of Protestantism and infant mortality circa 1850 are negative ( $-.201$  and  $-.327$ , respectively) but neither reaches significance, confirming the absence of a relationship between these variables. The absence of relationship is confirmed by the nonsignificance of the standardized regression

coefficient in Table 4, which controls for variation in the date of measurement. For the middle of the nineteenth century, therefore, we do not find the association between the religious composition and the standard social welfare indicator represented by infant mortality that the Common Interpretation suggests. Rather than any simple association with religion, Figure 6 suggests a geographical pattern, with a strong gradient of increasing infant mortality from west to east, and possibly a weaker one from north to south.

The data for 1900 in Figure 6 (crosses) exhibit a pattern surprisingly similar to the 1850 pattern. While infant mortality has declined in several countries, rates are still very high by modern standards. Infant mortality has actually *increased* in Belgium, Spain, and France, and to a lesser extent in Ireland. However, the tendency of the data points to align themselves along a downward sloping trend from upper left to lower right, indicative of Protestant advantage, has become more visually compelling. The visual impression translates into a negative Pearson correlation of  $-.578$ , which is now significant at the .05 level and approaches significance at the .01 level, based on one-tailed tests. The Spearman correlation is even stronger ( $-.701$ ) and significant at the .01 level. Between the middle of the nineteenth century and 1900, a significant association between the religious composition and infant mortality has emerged.

The figures for 1955 (triangles) indicate that massive transformations took place between 1900 and 1955. For all countries infant mortality has dwindled to figures much closer to contemporary standards, suggesting that the bulk of the long-term beneficial impact of industrial development on infant mortality was felt during that period. Despite some anomalies, such as the comparatively high figures for Hungary and Germany — a possible residue of the earlier west to east gradient, or a belated echo of World War II and the occupation that followed — the relationship between infant mortality and the religious composition has also become much stronger during the first half of the twentieth century, corresponding now to a Pearson correlation of  $-.712$  (Spearman correlation of  $-.853$ ), significant beyond the .01 level. In 1955, the nearly all-Protestant countries of northern Europe boast low infant mortality rates, while the nearly all-Catholic countries of southern Europe, but also France and Belgium, suffer high rates in comparison. The highest figure, for Catholic Portugal, is more than five times the lowest one, for Protestant Sweden. All countries that are 10% Catholic and above have higher figures than all of the countries that are more than 90% Protestant.

In sum, we find no significant relationship between Protestantism and infant mortality circa 1850, but a negative relationship emerges and increases in strength and significance during the next hundred years. How should one understand this pattern in relation to the Common Interpretation? Superficially, the strong negative association of Protestantism with infant mortality that becomes established in the twentieth century would seem to constitute evidence for the Common Interpretation. The timing, however, is not right. If Protestantism facilitated the development of industrial capitalism, and low infant mortality is a good measure

of that development, then one would expect the relationship between Protestantism and infant mortality to be stronger at earlier times, when levels of industrial development and infant mortality rates were so much more uneven across Europe, than in the contemporary period when industrial technology has diffused far and wide and social progress has reduced infant mortality in the industrial world to nearly uniform low levels.<sup>27</sup> The strong association between Protestantism and infant mortality that developed during the twentieth century, but did not yet exist by the middle of the nineteenth century, does not constitute good evidence for the Common Interpretation, since the essence of the historical argument would have predicted the appearance of the association much earlier.

The late appearance of a negative association between Protestantism and infant mortality, while it does not constitute empirical support for the Common Interpretation, provides a tantalizing clue concerning its genesis. At the turn of the century, when Weber was writing *Protestant Ethic*, there probably were cross-national data available to him pointing to a positive association between Protestantism and the sort of generalized social welfare universally presumed to be indicated by low infant mortality. This relationship persisted or was amplified during the next half century, the period immediately preceding the elaboration of the Common Interpretation. Weber's original intuition on the relationship between Protestantism and capitalist development, possibly, and the perception of the scholars who later elaborated on Weber's work to construct the Common Interpretation, almost certainly, were influenced by these contemporary comparisons between Protestant and Catholic countries. However, maybe because the data for earlier periods were not as readily available, it may not have been clear to these observers that the association of Protestantism with social welfare was such a recent development. Thus, the link between Protestantism and social welfare as denoted by low infant mortality, while historically shallow, may have been projected backward in historical time to strengthen post-hoc the emerging stereotype associated with the Common Interpretation.

The impression of long-standing Protestant superiority may have been reinforced by the trends in infant mortality during the second half of the nineteenth century. Except for a negligible rise of infant mortality in Denmark, which began the period with a low rate in any case, all majority Protestant countries improved during this period. In particular, highly visible Germany, set in the middle of Europe, experienced an impressive decrease in infant mortality of 23% in the second half of the nineteenth century. In stark contrast, the situation in Catholic Belgium, Spain, and France deteriorated (by as much as 22% in Belgium). This all adds up to an overall European picture in which it would have been natural to discern a contemporary trend of social welfare improvement in the Protestant countries accompanied by deterioration in the Catholic countries. The temptation to extend back into the past, not only the then current situation but also this contemporary trend, must have been compelling in the absence of systematic

contrary evidence. A short recent trend could thus have been mistaken for a long-standing condition.

## Discussion

We have compared countries of nineteenth-century Europe to investigate the hypothetical associations between Protestantism and various dimensions of the development of industrial capitalism that were derived from the Common Interpretation of Weber's *Protestant Ethic*. We did not find the predicted relationships between percentage Protestants and wealth per capita, date of founding of the principal stock exchange, extension of the railroads network in 1870, male labor force in agriculture, male labor force in industry, and infant mortality circa 1850.

We did find a significant relationship between Protestantism and savings bank deposits per capita, and weaker evidence of an association between Protestantism and total bank deposits per capita, supporting the idea of superior Protestant frugality. This finding lends credence to one of the intermediate causal links that we have distinguished in the Common Interpretation: the mechanism linking Protestantism with behavior, in this case frugality or thriftiness. However, the rest of the causal chain predicting favorable economic consequences of frugality, in terms of greater wealth, was not supported. We also found that in 1900 and in 1955, Protestantism was associated increasingly strongly with low rates of infant mortality, although the association did not exist in 1850. We pointed out that existence of an association in later periods, but not earlier, is not convincing evidence in favor of the Common Interpretation. Finally, we found that one indicator of development, the extension of the railroads network in 1900, had a statistically significant negative association with Protestantism: At the turn of the century, Protestant countries were lagging systematically behind Catholic ones in railroads development, a pattern opposite to that expected on the basis of the Common Interpretation. This is not a trivial finding, given the close association between capitalism and railroads development acknowledged by a broad range of commentators.

Since secondary historical data are notoriously difficult to handle, some of our operational decisions are bound to be debatable; however, it is important to view these findings in their real empirical context. These research results are not pitted against other empirical findings that might perhaps be more palatable to believers in the Common Interpretation. Alternative empirical evidence simply does not exist as of this writing.

Overall, these results lend little support to the Common Interpretation. They certainly do not constitute a strong, or even mildly plausible, case in favor of the idea that Protestantism caused, facilitated, or was in any way instrumental in the development of industrial capitalism. In view of these data alone, it is doubtful that a naïve observer — one unaware of the prestigious Weberian tradition

embodied in the Common Interpretation — would think of claiming a special affinity between Protestantism and industrial capitalism. We must repeat at this point our earlier disclaimer that what we have investigated is the Common Interpretation of Weber's work, not necessarily Weber's own subtle thought on the relationship between Protestantism and the rise of capitalism. We saw that Weber's work could be interpreted in a way (via the "Protestant minority" and "initial impact" scenarios) that leaves it unaffected by our results.

Our empirical results fit well the known history of diffusion of industrialization from its birthplace in England to the European mainland. From England, industrialization spread first to Belgium and Luxembourg, northern France, the Rhineland region of Germany, Switzerland, and the Netherlands. These regions are partly or largely Catholic. Only later did industrialization extend to the Protestant Scandinavian countries to the north, the Catholic countries to the south, and various points to the east. Rather than any predisposition to industrial capitalist development based on religious beliefs, the history of industrialization strongly evokes a process of diffusion along gradients of geographical accessibility affected by both proximity and the presence of major waterways such as the Rhine. At some point during that process, Catholic regions of Belgium, France, and the western part of Germany that were closest to England were relatively advanced compared to the more distant Protestant countries of Scandinavia, eastern regions of Germany, and the countries of southern Europe. The prolonged backwardness of all-Protestant Scandinavia, in particular, is often overlooked in the modern historical perception (Jorberg 1976).

We did find evidence that by the end of the nineteenth century the inhabitants of Protestant countries saved more than those of Catholic countries, even controlling for wealth. Yet it is noteworthy that Protestant countries were not, at the same time, systematically wealthier than Catholic countries. Two hundred years of Protestant frugality had largely failed to produce their expected worldly reward. The finding pertaining to railroads development, tapping an infrastructural dimension of capitalism, tells another instructive story. Protestantism is systematically associated with the late development of railroad infrastructure that a variety of commentators view, for different reasons, as an essential marker of capitalism. Against our largely negative results, the idea that Protestantism as such was associated with the rise of capitalism and, therefore, with its various socioeconomic benefits, rests solely on selected anecdotal evidence fortified by the perception of the well-being of contemporary Protestant countries.

One major limitation of the present study is that, in order to assemble quantitative comparative data, we have been constrained to use nations as units of analysis. If the data had been available, it would have been better to conduct the analysis at a regional rather than state level in order to map more closely the regionally heterogeneous spread of industrialization on the continent. Religiously heterogeneous countries such as Germany, the Netherlands, and Switzerland are potentially amenable to regional comparisons of industrial capitalist development

as a function of the religious distribution. Can we find more support for the Common Interpretation in such regional analyses? We mentioned earlier that some regional patterns, such as the high proportion of Catholics in the Rhine and the Ruhr Valleys, which are also the heartland of German industry, contradict the Common Interpretation.

The Swiss Confederacy, with its 25 cantons ranging in religious composition from 95.4% Protestant (Appenzell Ausser-Rhoden) to less than 1% (Ticino), casts tantalizing light on the Common Interpretation. In preliminary results of a study of Swiss cantons using late nineteenth-century data, we find that residents of more Protestant cantons are more likely to hold small savings (“caisse d’épargne”) accounts than residents of more Catholic cantons, suggesting superior Protestant frugality, and that children in more Protestant cantons obtain better grades in national examinations than children in more Catholic cantons, indicating perhaps greater diligence among Protestants. In spite of this exemplary behavior, by the end of the nineteenth century, Protestant cantons are not perceptibly better off than their more Catholic neighbors, as indicated by the nonsignificant differences in aggregate savings per capita and in infant mortality. Again, this finding suggests the possible existence of a relationship between religion and behaviors, such as frugality and diligence, which is not further translated into indicators of greater material progress. The Swiss regional data closely parallel in that respect the relationship we found at the national level for savings per capita, which were significantly associated with Protestantism, as contrasted with wealth per capita, which was not.

Five different empirical tests based on the Common Interpretation, a widespread and seemingly reasonable interpretation of Weber’s *Protestant Ethic*, failed to supply it with substantial support. Other tests could be conducted in spite of the paucity of data available and of the difficulties inherent in the handling of historical data. We noted, in particular, that analyses at the subnational (regional) levels were both desirable and probably feasible. Other researchers may find innovative testing approaches that sidestep the quasi-theological struggles in which the literature has become entangled. We hope we have provided a precedent for daring empirical research about a belief that may be grounded in no more than selected anecdotal evidence aided by fallacious retrospective imputation. While such new empirical research could potentially contradict the findings presented here, we believe the prospects for this are not good: Not much of an empirical nature has happened in the more than four decades since Samuelsson’s ([1957] 1993) multifaceted repudiation of the hold *Protestant Ethic* has on our imaginations. No doubt, other valid interpretations of *Protestant Ethic* exist. They too should be subject to ordinary, conventional empirical testing. In the final analysis, as Cohen already argued in 1980, not only must Weber’s thesis be capable of disconfirmation, it needs historical evidence to *support* it. Absent such evidence, it remains no more than an intellectually enticing hypothesis and a beloved academic myth.

Notes

1. Lenski, Nolan & Lenski (1995) incorporate Weber's thesis within the larger context of their ecological-evolutionary perspective, which emphasizes the importance of the accumulation of technological knowledge during the agrarian era in the genesis of the Industrial Revolution. Accordingly, they also emphasize the role of the Reformation in the spread of literacy.
2. A survey by one of the authors of a convenience sample of all sociology textbooks in the library of his small (Catholic) university indicates that fully 20 out of these 22 texts, published between 1934 and 1984, mention that work explicitly. The list of textbooks is available on our web site at <http://www.unc.edu/~nielsen/projects.htm>.
3. A *Newsweek* article on the educational crisis of American sociology cites *The Protestant Work Ethic* [sic] as one of the five "top titles" of the discipline (Kantrowitz 1992). In a long review article in the *New York Review of Books*, historian of Europe Gordon Craig (1992:40) presents the psychological thesis in *Protestant Ethic* as accepted fact. In a PBS documentary on the Gold Rush aired on January 16, 1999, official California historian Kevin Star refers to the "Protestant work ethic" in connection with the labors of the 1848 gold prospectors. See also Horner (1994).
4. Dickson and McLachland (1989) point out that Franklin was not even a Protestant — he is better described as a Deist from a Quaker background — and they further accuse Weber of using his sayings selectively. On the other hand, an anonymous reviewer suggested that Weber's choice of a Deist may be wise, since Deism may have been most important for economic development. Germani (1968) argues that trends toward the abandonment of other-worldly orientations, toward Deism, and thence to secularism may have been a prerequisite to modern industrial society. In that respect, Protestantism would appear to offer a smoother intellectual transition to secularism than does Catholicism (i.e., it was easier to become the Deist Ben Franklin of *Poor Richard's Almanack* than the Deist Denis Diderot of the *Encyclopédie*). But Groethuysen ([1927] 1968) argues forcefully for the opposite position. Faced with a direct interdiction in the form of the blanket Church prohibition against charging interest, the budding Catholic bourgeoisies of northern Italy, Catalonia, Belgium, France, the Netherlands, and the German Rhineland and Ruhr may have sloughed off religion *more* resolutely than their Protestant counterparts. While we cannot properly adjudicate between these two views, we note that our results seem most compatible with the latter.
5. Becker (2000) shows that this disproportional representation rested on 400 individuals, or about 4% of the total sample, well within the range of likely enumeration errors. Furthermore, Becker argues, these choices were not a pure reflection of Catholics' mentality since Catholics were forced into certain occupations by official discrimination.
6. We are grateful to an anonymous reviewer for pointing out this passage of Braudel to us.
7. These results are available on our web site at <http://www.unc.edu/~nielsen/projects.htm>.
8. We are grateful to an anonymous reviewer for drawing our attention to this important point.

9. Although a small-scale civil war with genuine religious overtones was fought in Switzerland in 1847, emigration figures for the period indirectly suggest that it did not appreciably affect the religious composition of that country. The net Swiss Catholic immigration into the United States for the 1840 to 1850 decade was 1,382 against 1,435 in the preceding decade (Shaughnessy [1925] 1969). Similarly, while the secession of Belgium from the Netherlands in 1830 was along religious lines, it was neither preceded nor followed by substantial religious migrations.

10. Shaughnessy ([1925] 1969) systematically underestimates the percentage of Catholics because of his attempt to distinguish between active (practicing) Catholics and nominal ones.

11. The cession of Alsace-Lorraine to Germany in 1871 altered France's religious composition because of the high concentration of Protestants in that region. The figures for 1862 and for 1884 in Table 1 show the percentage of Protestants as declining from 4 points down to perhaps less than 2 points between the two dates. However, because the figures are so small, the change does not affect the rank of France on the religious dimension relative to other national units in the data set.

12. The small Catholic increase in the Netherlands, and the small Catholic decrease in Austria-Hungary, together suggest that any differential natural increase would not be systematically tied to religious affiliation.

13. The Catholic Emancipation Act, which removed almost all civil and political disabilities from British and Irish Catholics, was promulgated only in 1829. The Penal Laws, which theoretically treated Catholics severely, remained in force from the beginning of the eighteenth century to approximately the time of the American Revolution.

14. The high percentage of Catholics in Great Britain during the 1860s and the later decline in the 1870s (from 8 to 5%) probably reflect Irish migration to Scotland in the aftermath of the potato famines of the 1840s and later selective emigration of Catholics from Great Britain to the U.S. (Mokyr 1980). It is, therefore, possible that Great Britain had a higher percentage of Protestants from 1700 to the mid-nineteenth century than allowed by the earliest figures available, but not nearly enough to place this entity on a par with the Nordic countries.

15. Excluded by definition from the study are, therefore, predominantly non-Christian countries and countries where Eastern (Orthodox) Christianity was the dominant religion. We also excluded neo-European countries — the U.S., Canada, Australia, New Zealand, and possibly Argentina and Chile — as they present specific challenges of religious enumeration because of their history of immigration, and because they began industrializing somewhat later. Poland should probably have been included as a national unit, despite its political subjugation during most of the period of interest, but data on Poland are not available because of territorial discontinuity.

16. The term "Ireland" always refers to the entire Irish isle, since Ulster was not separated from the rest of Ireland until 1920. We treat Ireland as a separate entity whenever data are available because we suspect that the contrast between socially progressive — and Protestant — England and Scotland, and backward — and Catholic — Ireland looms large in the semiconscious underpinnings of the Common Interpretation in English-



speaking countries. Note that treating Ireland separately increases the likelihood of support for the Common Interpretation.

17. This exception to the general coding principle results in three decisions that might be questioned on grounds of consistency. For Norway, we selected the date corresponding to first quotation of shares because the alternative, the year of “foundation” without mention of shares, almost certainly implies trading in other than corporate stock, according to our historical reading (of Neal 1990, among others). Conversely, for Sweden we preferred the early and bare “foundation” date to the limpid but absurdly late date of “inauguration of laws.” For Germany, we preferred the date of first listing of shares rather than the much later but implausible date of “stock exchange law.” On balance, any correction toward greater classificatory consistency would tend to strengthen our results.

18. Thus, the “pro-CI” date for the Netherlands is that of the 1631 construction of the Amsterdam stock exchange *building*. This violates Braudel’s seemingly reasonable — but far from superfluous — injunction against confusing buildings and social institutions (1979).

19. Railroads construction may not be a direct measure of the success of *private* entrepreneurial capital; in European countries, as was the case in the U.S., the construction of national railroad systems was largely either the result of government initiatives, or heavily aided by government. Instead, one might think of railroad development as a testimony to the self-confidence and political clout of the new entrepreneurial class (Delacroix & Ragin 1981).

20. The exception is Austria-Hungary, where the railroads network reached maximum extension in 1913, before the dissolution of the empire in the aftermath of World War I. The combined trackage of Austria and Hungary after the war was less than that of the empire in 1913.

21. A revisionist view identified with Braudel (1977, 1979) emphasizes the role of artisan production, as opposed to factory production, in the Industrial Revolution, especially its early phase (before 1830). We do not disagree with this view, but we reckon that the labor force variables have face validity as indicators of industrial capitalism for the period under consideration.

22. To control for this, we carried out additional analyses (not reported here) with an *industry weight* variable representing the industry percentage of the male labor force in agriculture and industry. The substantive results are the same as those reported for male labor force in industry.

23. Figures for the Netherlands are interpolated for 1870 from figures for 1859 and 1889. For Norway we used the 1891 figures instead of the earlier ones for 1875 because the other category was abnormally inflated in that year, reducing the percentage total of the labor force in agriculture and industry to unrealistic values of 27% and 16%, respectively. (Any resulting bias would favor the Common Interpretation.) Figures for Austria and Hungary are based on the total labor force, as data are not available separately by sex.

24. These discrepancies include possible changes after the seventeenth century in the percentage of Protestants in Ireland and France.

25. We also use multiple regression analysis to evaluate the effect of Protestantism on the propensity to save, controlling for wealth, as explained below.

26. The infant mortality figure for Ireland corresponds to the year 1864. While the late measurement date may have affected that figure downward, an examination of the infant mortality figures for the second half of the nineteenth century reveals a consistent pattern of low infant mortality for Ireland, compared to most European countries during that period. One's surprise at the low Irish mortality figure may be a measure of the pervasiveness of the Common Interpretation. The Irish pattern of low mortality was noted by Kennedy (1973): "After the Great Potato Famine of 1845–51, Irish emigrants to North America and Australia were actually leaving areas of relatively high life expectancy for areas of comparatively low life expectancy."

27. As pointed out by an anonymous reviewer, the infant mortality measure may be "mixing rurality and sewers." In earlier times, mortality was lower in the countryside than in towns, which were unsanitary; in later periods, principally because of the development of sewer systems, mortality in towns was lower than in the countryside. Thus an urban influx prior to the sanitizing of towns may have increased infant mortality. Consistent with this scenario are the relatively high infant mortality rate in 1850 in England and Wales, the undisputed leader of industrial capitalism, the overall lack of progress in mortality there between 1850 to 1900, and the increase in mortality in highly industrialized Belgium and France over that period.

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