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Causes and Consequences of the Protestant Reformation*

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The Protestant Reformation is one of the defining events of the last millennium. Nearly 500 years after the Reformation, its causes and consequences have seen a renewed interest in the social sciences. Research in economics, sociology, and political science increasingly uses detailed individual-level, city-level, and regional-level data to identify drivers of the adoption of the Reformation, its diffusion pattern, and its socioeconomic consequences. We take stock of this research, pointing out what we know and what we do not know and suggesting the most promising areas for future research.

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Though Protestantism had begun as a strictly religious reform movement, the people behind the new economic forces seized the Reformation and bent it to their own economic needs. [...] As the modes of production changed, the people responsible for these changes searched for a state that would legalize what they were doing and for a religion that would sanctify it. They adopted the Protestant religion and made it embrace the capitalist state. The two went hand in hand like bride and groom.”

(Max I. Dimont, *Jews, God and History*, 1962)

I. Introduction

The Protestant Reformation was one of the most far-reaching events of the last millennium. It ended the ancient hegemony of the Catholic Church in Western Europe and altered political and economic fortunes. Beyond its upcoming 500-year anniversary (with 2017 officially being designated the "Lutherjahr" in Germany), it continues to fascinate social scientists for several reasons. First, the economic consequences of the Reformation are of wide-ranging importance for debates concerning the emergence of economic growth in Western Europe as well as for our understanding of comparative economic development. Second, the role of economic development and innovations in communications technology and media in instigating change in the Reformation has broader comparative implications. Third, the case of the Reformation is an important example of institutional change, the origins and effects of which are areas of importance in economics as well as political science and sociology.

Our survey persuades us that the recent research we highlight has advanced our understanding of the causes and consequences of the Reformation. For one, there is far greater attention to causal assessment than was the case in the past. We attribute much of this to the use of econometric methods and its emphasis on causal identification, a marked improvement over descriptive approaches and inference based on correlations. However, many of the studies of the long-term consequences of the Reformation outside of economics use comparative case-based methods. Although these often allow for narrative techniques of causal discernment, their external validity is more suspect. In addition, while sociological studies would generally benefit from the adoption of econometric methods, economic studies might benefit from greater contextualization and attention to qualitative evidence, particularly in the selection and justification of instrumental

variables. Mixed-method designs are making important strides in improving the validity of comparative and historical social science and may help improve the state of the art in research on the Reformation.

We find that the emerging literature on the Reformation by economic historians and other social scientists has already made important contributions that have both confirmed previous hypotheses and suggested new understandings of the Reformation. In moving beyond the limited case studies of particular imperial cities, regions, or principalities that have been the usual domain of historians and by disaggregating countries into smaller units such as towns and counties, researchers have systematically tested both existing explanations and novel hypotheses. They have increasingly employed advanced econometric techniques such as instrumental variables (two or three stage least squares) to pin down causal effects. Instrumental variables analyses represent a significant advance over previous econometric techniques because they permit the researcher to overcome issues of reverse causality and omitted variable bias that are inherent in historical data. Using these techniques, researchers have found support for some of the prominent arguments in the historical literature, such as the importance of the political and economic incentives in decisions to institute reform or the effects of printing as a new information technology on demand for Protestantism. But researchers have also found support for newer explanations, emphasizing social diffusion through proximity or through social ties as important features of the success of Protestant movements. Numerous studies have demonstrated the lasting consequences of the Reformation not only for economic growth but also for institutional development and long-term patterns of intolerance and social conflict.

This survey summarizes the social science research on the religious economy of Western Europe at the time of Luther and the causes and consequences of the Reformation. We divide the literature focusing on the causes of the Reformation into supply-side and demand-side factors, although numerous studies emphasize both. To be clear, by the “supply-side” of the Reformation, we mean either institutional or technological features that *permitted* the Reformation to spread more rapidly or *limited* the ability of the Church and its political allies to stop its spread. By “demand-side”, we mean those features that affected the desire for the reform of the Church among the population and political elite. The literature on the consequences of the Reformation shows a variety of short- and long-run effects, including Protestant-Catholic differences in human capital, economic

development, competition in media markets, political economy, and anti-Semitism, among others. For historical and pragmatic reasons, these studies tend to go beyond the boundaries of Central Europe more than studies of the causes of the Reformation.

It is just as important to note what this analytic survey does not intend to accomplish. First, it is not a historiographical essay and thus does not review the very broad and accomplished historical literature on the Reformation that is primarily narrative in method and principally concerned with description. Whereas a number of useful essays on the historiography of the Reformation already exist (e.g., Brady 1998a; Karant-Nunn 2005; Rittgers 2011) and many more will doubtlessly appear in connection with the upcoming anniversary of 1517, a review of the social scientific literature on the Reformation has not yet appeared.¹ Second, it is concerned with works on the Reformation that have been produced by scholars working within the disciplinary boundaries of economics, political science, and sociology that are intended to yield general explanation. Third, it occupies itself largely with literature related to the causes of institutional change and the effects of religious institutions on economic and political development rather than cross-national studies on the association between different religions and democracy or economic growth, such as Barro and McCleary (2003).

The Reformation has led to insights into broader questions in the social sciences due primarily to the confluence of newly digitized data from the Reformation period combined with an increased emphasis within economics on identification of causal effects. The latter affects Reformation research because the Holy Roman Empire (hereafter, HRE) provides an outstanding historical opportunity to identify causes – especially of economic and political phenomena – due to its decentralization and spatial variation. In other words, some of the recent research is not interested in the Reformation per se, but exploits the fact that the Reformation was a major event

¹ In the past, the dialogue between the field of history and the social sciences was greater than it is today. Pioneering social historians such as R.W. Scribner (1987, 1994), Heinz Schilling (1986, 1988) and Bernd Moeller (1972) urged scholars to understand the Reformation not only in theological or cultural terms but also in economic and sociological terms. Scribner (1986: 26) went so far as to endorse data-driven studies and multivariate analysis on the causes of the Reformation, suggesting that historiography had proven too unsystematic and biased by endogeneity and selection issues to offer compelling general explanations. After the decline of social history and the advent of the cultural turn in historical writing, few historians had either the interest or the training to contribute to systematic work on the causes and consequences of the Reformation. As a result, since the 1990s nearly all of the contributions to a general understanding of the Reformation's causes and consequences based on systematic analysis of data have come from the social sciences. The long shadow of the Weber thesis is one reason why economic historians have made the most extensive contribution to the new understanding of the Reformation, but political scientists and sociologists are also making important contributions.

that took place in a region where economic identification is possible.² As a result, the HRE has seen a broad resurgence in economic history research outside of the Reformation.

Besides the fact that the “shock” of the Reformation helps identification of causal effects, in other fields (political science, sociology) the heterogeneity, political decentralization, and dynamism of the HRE have also drawn interest because they offer comparative leverage across times and place within a single case. Germany is also advantageous as a unit of analysis for its scholarly traditions and good record keeping. Social scientists have made use of comprehensive lists of monastic establishments, university enrollments, shrines, printing presses, and other features of late medieval German life that historians carefully assembled. Without this impressive stock of secondary materials, the hurdles obstructing multivariate studies would have been immense. The downside of the resurgence in interest in the HRE is that the HRE is just one case; extending the insights gathered from these studies beyond its borders requires context-specific analyses of the cases in question.

II. The Origins of Reformation Studies in the Social Sciences: Weber and Tawney Revisited

In an extended essay composed in 1904 and 1905, Max Weber attempted to deepen understanding of the cultural forces that made possible the Industrial Revolution. Throughout his career, Weber was interested in explaining why self-sustaining economic growth and organizational rationalization first occurred in Western Europe. The resulting essay, “The Protestant Ethic and the Spirit of Capitalism,” was in many regards, a response to what he saw as the one-sidedly materialist understanding of economic history promoted by political economy. The slim book has a nuanced argument and the evidence given for it is largely anecdotal. Hence, it allows for several interpretations. However, for our discussion, the most important interpretation is that Protestant ideas about work and wealth accumulation influenced European societies by changing values and orientations toward profit-seeking activities. Whereas Luther attacked the special status of the clergy and promoted the idea of secular vocations being equally God pleasing, the great contribution to the capitalist spirit came from Calvin’s theology. Confronting the psychological tension created by the Calvinist notion of double predestination, the Puritans developed “worldly

² There is a risk that some researchers might ignore the context of the Reformation and blindly regard the Reformation as a natural experiment. We argue that the vast majority of the research discussed in this survey is careful in dealing with the historical context.

asceticism,” the combination of repudiation of consumption alongside this-worldly economic activity to produce the material evidence of divine election that believers desperately sought. Although sectarian Calvinists comprised a minority group, their influence diffused through their successful entrepreneurialism and helped to ignite the capitalist takeoff in northwestern Europe. Over time, Protestant ideas secularized, informing the cultural materialism and economic rationalism at the heart of industrial capitalism. Weber claimed that the cultural dispositions that came out of the Reformation not only explained why some societies were far more developed than others but also explained patterns of education and social stratification in early 20th century Europe.

Weber himself recognized the limitation of his thesis, and in later work, reduced Protestantism to one cause among many (Weber 1981). Nevertheless, the Weber thesis proved durable, not least because it appeared to offer a corrective to Marxism and, with modifications, a host of scholars took it up. However, the English economist R.H. Tawney, among others, pointed out historical inconsistencies in Weber’s account. Tawney’s most influential critique was that important capitalist institutions such as banking and long-distance credit preceded the Reformation. In his survey of late medieval economic history, Tawney found no shortage of entrepreneurial energy and observed that, “it seems a little artificial to talk as though capitalist enterprise could not appear till religious changes had produced a capitalist spirit” (Tawney 1926: 316). His survey revealed that modern capitalism took root in the 15th century in Italy, southern Germany, and Flanders. Nevertheless, Tawney described his perspective as being indebted to Weber even though he saw the cultural issue relevant to the Industrial Revolution being the greater self-confidence and sense of expediency that the English and Dutch commercial classes brought to religion, politics, and economy in the 17th century.

Tawney’s was not the last word on the Weber thesis, nor did it prevent it from remaining influential in the social sciences. Since Tawney there have been numerous studies taking up the Weber thesis. One of the most forceful criticisms was made by Swedish economic historian Kurt Samuelsson ([1957] 1993), who disputed three basic claims of the Weber thesis: (1) that the practices of modern capitalism preceded the Reformation; (2) that Weber misunderstood and exaggerated the influence of Puritanism; and (3) that capitalism did not require worldly asceticism. Like Tawney, Samuelsson argued that there is abundant evidence that capitalism had already taken firm root prior to the 16th century. He attacked Weber’s historical generalizations and his use of empirical evidence, showing that he misstated the supposed advantage that modern Protestants

enjoyed in income and education. Samuelsson argued that Calvinists were far more ambivalent toward capitalist ethics than Weber allowed. He also claimed that Protestant thriftiness could not account for sufficient accumulation to have made a difference in capitalist breakthrough.³

More recently, McCloskey (2010) made a forceful case against the Weber thesis that echoes Tawney. For McCloskey, it is innovation, not accumulation, which explains the capitalist breakthrough in the West. It is less the putative frugality and vocational ethics of the Reformation than a new rhetoric of “unbounded innovation” which emerged during this era that provided the political force and moral justification for industrial capitalism. In this sense, Protestantism may have been important by furnishing a new language and a new sense of confidence among the bourgeoisies of Northwestern Europe.

Recent econometric studies also echo Samuelson’s repudiation of the Weber thesis. After testing its ability to explain levels of 19th-century European industrialization, Delacroix and Nielsen (2001) dismiss it as a “beloved myth” of the social sciences. Akçomak, Webbink and ter Weel (2016) cast doubt on the Weber thesis by investigating the case of the Netherlands. They argue that the Dutch were already on the path to modern capitalism without Protestantism. By the middle of the 16th century, literacy rates in the Netherlands were greater than in neighboring regions. These developments, in turn, promoted greater economic development and vibrant publishing activity that created the tensions that eventually erupted into open rebellion. They explain the advanced development of the Netherlands as resulting from late-14th century religious innovations such as Brotherhood of the Common life that originated in Deventer and increased popular piety by engaging in charity, teaching Scriptures, copying books, and most importantly, improving literacy. Regression analyses which include an instrument for distance to Deventer support their claim and suggest why the Netherlands developed early and, at a later date, became and remained Protestant in spite of firm Habsburg repression in the decades leading up to the Eighty Years’ War (1568-1648).

Another recent historical study casting doubt on the timing laid out in the Weber thesis is Andersen, Bentzen, Dalgaard, and Sharp’s (2016) paper on the pre-Reformation origins of the work ethic that Weber attributed to Protestantism. They argue that the puritanical Cistercian monastic

³ Decades before Weber, Marx (1995:363) famously dismissed the idea of a “so-called primitive accumulation” by which “the diligent, intelligent, and, above all, frugal elite” accumulated enough wealth to seed the growth of the capitalist mode of production. Rather, he emphasized expropriation and institutional changes that transformed early-modern workers into wage-laborers.

order promoted values championing work and frugality centuries before Luther and Calvin. More importantly, Cistercians contributed to long-term development by improving local productivity. Employing a comprehensive list of Cistercian houses in England, they demonstrate a positive association between monasteries and population growth over several centuries. An instrumental variable analysis backs their causal claim between Cistercians and growth and supplementary analysis shows that an association between Cistercians and growth persists in contemporary Europe.

In short, while social scientists of different stripes seem to agree that cultural and religious change may well have been a factor in the emergence of modern capitalism, they differ sharply on what role Protestantism played. Nevertheless, beyond the endless permutations of the Weber debate, two fundamental questions largely unexplored quantitatively until recently are: why did Europe have its Reformation at all? Why did the Reformation spread when and where it did?

III. Causes of the Reformation

Perhaps the most surprising aspect of the Reformation was that it spread beyond Wittenberg in the first place. The problem for would-be reformers was that the Church had often crushed any attempts at reform – describing them as “heresies” worthy of severe punishment – before they spread. One of the earliest of these reform attempts, the Waldensian movement of the 12th and 13th centuries, rejected open displays of wealth among churchmen. They gained a following in France, Spain, and Italy, but the Church and its secular allies brutally suppressed them wherever their influence grew too large. Ultimately, the Church enacted a decree of death by burning against Waldensians at the Council of Gerona in 1197. Their 15th-century successors, the Lollards, met a similar fate. The Lollards spread the ideas of John Wyclif (d. 1384), a theologian whose rhetoric blasted avaricious clergy while seeking a return to the Scriptures as the center force of Christianity. The most serious challenge to the Church came from the Prague preacher Jan Hus (c. 1372-1415), who led the Bohemian Hussite movement of the early-15th century. Like Luther, he spoke against the sinful nature of Churchmen and the avaricious nature of Church practices – including the selling of indulgences – and he yearned for a return to the biblical origins of the Church. He too called for the equality of the laity with the clergy. His movement spread throughout Bohemia (in the modern Czech Republic) in the 15th century, but the emperor and pope violently suppressed it before it

could spread further. For his role in inspiring such defiance, the Church had Hus burned at the stake in 1415.⁴

These pre-Reformation movements against Church power and wealth suggest that some form of latent demand for reform existed across Europe for at least a couple of centuries prior to 1517. Hence, it is unlikely that the Reformation was solely the result of some newly created demand for reform. Although some accounts stress a latent popular rejection of the Roman Church that made conditions ripe for the Protestant rebellion, other scholars take a different view. At best, they view demand as a necessary but insufficient cause of the Reformation. Indeed, the social historian Robert W. Scribner (2001: p. 3) said of research on the Reformation, "...the question therefore becomes one of strategic individuals, of leaders and militants, because there was no mass support for the Reformation, per se."

Most historians think that religious motivations combined with political and economic grievances fueled the rebellion against the Church. While there was certainly spontaneous enthusiasm for Luther in the first few years after 1517, this support did not necessarily result in the institution of Protestantism in the cities and territories of Central Europe. For one thing, enthusiasm for Luther's "Evangelical" movement was much more general than the triumph of reform. For another, in the cities where reform prevailed – as it did in 50 of the 65 free imperial cities of the Holy Roman Empire (Ozment 1975) – it did so because Protestant agitators convinced guildsmen and burghers to reject the Catholic monopoly based on religious ideas, anti-clericalism, urban politics, and civic interests (Blickle 1992; Brady 1998b; Moeller 1972). For their part, be it because of their own convictions or perceived interests, the territorial princes sometimes rejected Protestantism or instituted a Protestant church in spite of popular will.

For these reasons, a large portion of the recent literature on the causes of the Reformation focuses on supply-side changes, i.e. institutional or technological features that permitted the Reformation to spread more rapidly or limited the ability of the Church and its political allies to stop its spread.

⁴ Tawney (1926) and Stark (2003) summarize these developments.

III.1. The Political Economy of Religion in Western Europe on the eve of the Reformation

One of the central contributions of the economics of religion is to treat religious groups as firms that compete for consumers in a market (Iannaccone 1994, 1998; McCleary 2011; Stark and Finke 2000). Religious firms are producers that depend on their adherents for revenue, delivering goods and services in exchange for member contributions. Much of the research on the political economy of religion has explored the effects of competition, whether by examining how pluralism influences the vitality of religious groups or by the role played by the state as a regulator of religious markets. In a pluralist religious market, firms compete with each other to service potential and current adherents, adopting a variety of market models depending on their product lines (Iannaccone 1995). Scholars have worked to integrate both supply- and demand-side factors and to explain religious behavior as well as organizations (Ekelund, Hébert, and Tollison 2006; Montgomery 2003; McBride 2008; McCleary 2011).

Political economy tends to determine the supply-side in the market for religions. Across times and places, a common strategy adopted by dominant firms to maximize revenues is eliminating competition by setting up a religious monopoly, which becomes the only officially permitted source of spiritual goods. Here, we are referring to a true monopoly situation, not merely one in which a single firm enjoys market dominance. A true religious monopolist benefits from an *incontestable market* that protects the monopolist from rivals offering superior products or lower prices. Such monopolies, like that enjoyed by the medieval Roman Catholic Church in Western Europe, do not emerge spontaneously. They rely heavily on secular power – the state – to guarantee their unrivaled market position (Gill 1998; Stark and Iannaccone 1994). Where a close relationship exists between rulers and religious monopolies, the obstacles confronting upstart firms are daunting. In the case of medieval Europe, the Catholic monopoly was strongest where backed by the power of princely or civil authorities that actively enforced orthodox claims, sanctioned excommunicates, and punished heretics.

In spite of their advantages, incumbent monopolists commanding incontestable markets may have sources of vulnerability. First, economic growth may serve as a demand-shifter by creating a more differentiated population with more diverse spiritual demands. As income improves, demand may shift from material security and supernatural assistance to transcendence and concern for the soul (Weber 1963). Rising income boosts consumption power, increasing the opportunity costs both of time spent in religious devotion and of moral restrictions on behavior and secular consumption.

Hence, religious monopolies tend to be more robust in societies characterized by slow economic growth, concentrated ownership, and widespread poverty (Ekelund, Hébert and Tollison 2006; Norris and Inglehart 2004).

Second, religious monopolists are prone to rent-seeking and poor performance (Iannaccone 1998; Smith 1986; Gill 1998). This is a serious vulnerability because spiritual goods are credence goods whose quality (e.g., the promise of salvation) cannot be readily empirically determined. Consequently, reputation matters when adherents assess the claims of religious firms. Rent-seeking innovations, clerical neglect and corruption are endogenous features of monopoly religious institutions that can undercut their self-enforcing properties by undermining the credibility of beliefs (Ekelund, Hébert, Tollison, 2006; Hull and Bold 1989; Iannaccone 1998). This, in turn, creates demand for new or reformed religious ideas in the religious marketplace. If an upstart firm can enter, it may be able to exploit a rapid shift in religious demand at the expense of the incumbent monopolist whose credibility as a supplier of spiritual goods has suffered.

Given these pressures, incumbent monopolists erect barriers to entry for rival firms. Established religious monopolies may command so much institutional power and benefit from so many privileges that rivals face nearly insurmountable barriers to entry (Miller 2002; Stark and Iannaccone 1994). For instance, enforcing orthodox teaching, legally forbidding rivals, and treating heresy or apostasy as criminal offenses all deter competitors in an established monopoly. Ekelund, Hébert, and Tollison (2006) note that established religious organizations construct monumental temples and other religious edifices that express their market dominance. In addition, their resources may allow incumbent monopolists to employ welfare and social benefits to increase the population's dependence on them, narrowing the opportunities for rival firms (Pfaff and Corcoran 2012). Conversely, when dominant firms fail to address the welfare of their adherents, they provide their rivals with an opportunity to offer a fuller range of material and spiritual goods and thereby win a niche in the market, as Stark (1996) shows for early Christianity in the Roman Empire.

Finally, religious firms seek the backing of secular political power. Rulers often find in an established religion a valuable partner who can lower the cost of rule by convincing subjects that their regime is divinely ordained (North 1981, ch. 5). Gill (1998) and Rubin (2016) propose that, where rulers are relatively weak and insecure while the established clergy is strong, religious organizations can extract favorable concessions including legal enforcement of monopoly

privileges, subsidies, tax exemptions, commercial monopolies, and even territories.⁵ However, as states grow stronger, rulers may extract concessions of their own, such as exempting political elites from tithes and other religious obligations and forcing established religions to surrender administrative autonomy (e.g., the right to appoint bishops) or a portion of religious revenues to the state. Upstart religious firms (such as Protestantism) may offer rulers a tempting alternative – depose the incumbent monopoly, thereby legitimating the state at a lower cost and permitting the expropriation of monopoly assets. In fact, those rulers that abolished the Catholic monopoly soon found themselves confronted with the tendency of Protestants to divide into rival churches and sects. The universal solution, referred to in the historical literature as “confessionalism”, was to impose a new territorial church as a local religious monopoly with the prince as the head or supreme bishop of the newly established church.

Does the stylized depiction of a well-entrenched religious monopolist facing supply and demand-side vulnerabilities match the historical image of the Roman Church on the eve of Luther’s rebellion? One might see the coming of the Reformation in light of a barely suppressed demand for religious innovations that a corrupt and relatively enfeebled monopolist could only struggle in vain to suppress (Ekelund, Hébert, Tollison 2002, 2006). Certainly, this was the depiction of Central Europe before the Reformation favored by earlier generations of historians (Huizinga 1924; Lortz 1968; Ozment 1980). The historian Owen Chadwick (1990: p. 11) went so far as to declare, “At the beginning of the sixteenth century everyone that mattered in the Western Church was crying out for reformation.” Chadwick concedes that there was far less consensus on what and how to reform. Some Central Europeans wanted political reform of the empire, some wanted a national church with greater autonomy from Rome, and others still wanted a humbling of the clergy and a reduction of religious commercialism.

Although there is much to support the idea of a longed-for reformation, the contemporary understanding is that the Catholic Church was in some regards popular, vital, well entrenched, and serving the needs of its diverse flock (see e.g., MacCulloch 2005). In order to remain the incumbent monopolist, the Roman Church had to maintain its exclusive claim to the provision of salvation and prevent rivals from entering the religious marketplace (Ekelund, et al. 1996). Catholicism was most secure and cost-efficient where its customers were loyal and its institutions were self-enforcing.

⁵ The Roman Church of the late Middle Ages not only possessed the Papal States but ruled a host of ecclesiastical domains governed by prince-bishops and abbots across the HRE as well.

Self-enforcement relied on the Church being widely understood as controlling the only route to eternal salvation. Many of the features of the late medieval Church such as service orders, clerical vows of poverty and chastity, the cult of the saints, and the distribution of charity appear to have increased the credibility of the Church's claims and contributed to its self-enforcing monopoly. Despite the problems of corruption and venality, the late medieval Church in many places strove to meet the needs of adherents and attracted popular support. It offered a rich culture of the sacred with abundant opportunities for religious experience and sacramental participation. Some of these practices appear to have helped to create deep connections between the Church and the people by making them direct beneficiaries of charity or by involving them in pilgrimages and popular veneration of saints (Cameron 2012; Duffy 2005; Heal 2007; Scribner 2001; Soergel 1993; Weinstein and Bell 2003; Taylor 2002).

Nevertheless, there were inherent tensions created by monopoly status that undercut performance, bred contempt for the clergy, and created incentives for the Church to over-exploit its consumers. Simony – the sin of buying and selling matters spiritual – was a widespread and detested practice of the late medieval church. The people especially resented the so-called “seculars” – the non-cloistered clergy – for their putative corruption. The Church made the pursuit of salvation a distressingly commercial venture through pilgrimages, the veneration of the cult of the saints, and the indulgences trade. In fact, the Catholic system of sanctification was rife with venality and eventually provoked a crisis in the struggle over the extension of rent-seeking innovations like the doctrines of purgatory, auricular confession, and indulgence (Ekelund et al. 1996; Richardson 2005). For instance, Luther's *Ninety-five Theses* were a reaction to efforts by Leo X to raise revenues by selling indulgences from sin, not only on behalf of the living, but also on behalf of the dead. Luther, and many clerics and laymen like him, was appalled by the increasing commercialization of the Church and the implication that salvation could be bought (Bainton 1950; Oberman 1989).

There can be little question that the Roman Church faced a dilemma in the early 16th century. Expanding trade and economic development in the 15th and early 16th centuries made it difficult for the Church as a universal supplier of religious goods to meet the demands of increasingly diverse consumers. Popular Catholicism became inadequate or even objectionable to the increasingly literate townsmen. Because of its efforts to exploit popular piety, they regarded the Church as too tolerant of “superstition” and of overly emotional religious practices that lacked Scriptural

foundations and seemed to dabble in the realm of the magical (Huizinga 1924; Ozment 1975; Thomas 1971). For decades before Luther, pious burghers were attracted to theologies and practices that were critical of the clergy and at greater tension with popular religion, such as lay orders, religious confraternities, and Catholic pietism (such as the *devotio moderna*). Given this kind of estrangement from Roman Catholicism, it is little wonder that some equally pious and practical townsmen would have responded to an opportunity to displace predatory, rent-seeking clerics while winning for themselves greater liberty from traditional economic strictures. Although historians long explained that this is why the Reformation gained such traction in the cities, other scholars claim that demand for greater piety could be satisfied without rebelling against Rome. Wealthier townsmen were able to produce satisfying religious goods through preaching foundations and other endowments. University study also expanded enormously in the decades before 1517. Both trends addressed supply-side vulnerabilities by producing better-trained clergy, a flourishing of Humanism, and improved Biblical literacy that might have satisfied middle-class demand (Akçomak, Webbink and ter Weel 2016; Taylor 2002).

To enforce its monopoly, the late medieval Church limited entry. In the late medieval world, Catholic power was most obvious in its organizational capacity to enforce orthodoxy. In the 13th century, the Church established a specialized mendicant order, the Dominicans, charged with preaching, identifying the wayward, punishing heresy, and asserting theological orthodoxy. Recruited and trained at the universities, Dominican friars occupied prominent faculty positions, and in many places, assisted in carrying out the Inquisition. As the religious crisis sparked by Luther began, the Church expected Dominicans to proclaim orthodox doctrine and take to the field against the Protestants (Ames 2009; Hinnenbusch 1975). Nevertheless, the Dominican order suffered for being compelled to defend the most odious practices of the Church. Mendicant orders also answered directly to the Pope, earning them resentment from townsmen for being outside of local control.

It was not until the convocation of the Council of Trent (1545), which launched the Counter-Reformation, that the defenders of orthodoxy were effectively coordinated and benefited from a coherent strategy to suppress the rising Protestant movement. Before this, Catholic counter-movements failed to publicize a consistent set of anti-Protestant ideas, published much of their propaganda in Latin, and relied heavily on the political support of local princes and urban magistrates to suppress Protestant heretics (Bagchi 1991; Edwards 1994). However, outside of the

territories ruled by prince-bishops, by the Habsburgs, or by sympathetic territorial lords, the Church could not rely on secular powers to crush the Protestant insurgency. For instance, Cantoni (2012: p. 505) notes that, “the [Habsburg] Emperor insisted on the fact that any decisions [regarding reform] should be made only after the meeting of a general Church council; some princes argued instead that the situation required them to assume episcopal powers as ‘emergency bishops’ (*Notbischöfe*) and proceeded with the foundation of state churches based on the Lutheran teachings.” In 1546, when Emperor Charles V belatedly invaded Germany with a papal mandate to restore “the holy Christian faith, and the unity of the same with sword and armed hand against the heretics,” he failed to consolidate his battlefield victory over the Protestants. A rebellion of the German princes against his monarchial ambitions, which included his erstwhile allies, overturned the settlement Charles had imposed and by 1552 sent him fleeing into Italy (Olson, 2011: p. 59).

Compared with the situation elsewhere in Europe, a favorable political context abetted the rebellion of the German princes against the Catholic monopoly (Nexon 2009; Te Brake 1998). The HRE was a confederal, elective monarchy in which the competing incentives of emperor and princes and political decentralization made it much harder for the Church to coordinate protection of its monopoly than in more unified kingdoms. Sovereignty was effectively fragmented and delegated to principalities and sovereign towns, limiting the emperor’s power.⁶ Whereas the Habsburg emperor and his proxies were committed to the defense of the Church and restoration of its monopoly position, the extent of their power outside their own domains was limited and depended on the cooperation of princes and urban magistrates who frequently sought to undermine their ambitions. Frederick the Wise (1463-1525), the Saxon prince who served as Luther’s early patron and protector, is a famous example of the difficulties the Church faced in gaining concerted political

⁶ The weaknesses and decentralization of the HRE persisted in spite of the attempts of Habsburg emperors to reform imperial institutions and reorganize the Empire. Particularly significant in this respect was the failed reform process (*Reichsreform*), initiated in 1495. This reform aimed to establish central taxing authority and centralizing judicial, administrative, and military institutions. In practice, imperial reformers probably could do no better than forge a compromise between an active imperial policy pursued through the annual Diets at the center and a transition toward stronger territorial states at the regional level (Brady 2009). Although the Empire itself proved durable and some of the institutional changes took hold, the general failure of imperial reform in the face of concerted opposition from self-governing territories and princely states meant that the HRE failed to follow other monarchies (France, Spain, England) in centralizing power, eliminating liens and intermediate levels of sovereignty, and exercising authority over the Church. Whereas other states were in a comparable position to the HRE around 1200, they then embarked on different trajectories that strengthened the hand of the Crown against territorial lords and ecclesiastical authorities (Kohler 1990; Neuhaus 1997; Nexon 2009).

support against the Protestants. Although Frederick appears to have remained piously Catholic (and amassed an enormous collection of holy relics), he was motivated to support Luther by the desire to reduce papal intrusions into his domain, to protect his sovereign authority, and by rivalry with other princely houses in the empire. He refused to extradite Luther to Rome and insisted on his having full hearing by the emperor before an imperial diet (Bainton 1950; Oberman 1989).

If political support was uncertain in the HRE, the Church had substantial organizational resources of its own that could bolster its position against the Protestants. Monasticism was one. By the time of the Reformation, urban monastic houses had become wealthy and often controlled sizable shares of local real estate. Although the tax exemptions and other privileges which monasteries enjoyed were frequently the focus of anti-clerical agitation (Scribner 1986; Ekelund et al. 1996), monasteries also provided townsmen with important sources of employment and demand for consumer goods. In addition to spiritual succor, the Church was the principal provider of welfare services. In effect, the Church charged its well-off adherents high prices for salvation and redistributed a portion of the proceeds to the poor in the form of alms and other charity. Altogether, the Church may have redistributed up to a third of its revenues to the poor through charity and related welfare services (Ekelund et al. 1996; Kahl 2005). In some towns it has been estimated that as much as half of the population was dependent on Catholic assistance on the eve of the Reformation (Southern 1990).

The historical picture of the robustness of the Catholic monopoly in the early 16th century is thus a mixed one: The Roman Church was resourceful and well entrenched but, particularly in Central Europe, had substantial liabilities and political vulnerabilities. The key task facing social scientists who want to understand the Reformation is to move beyond broad generalizations and macro-level trends, on the one hand, and, on the other, descriptions of particular towns and regions. The question becomes, in the face of a general Protestant rebellion that very swiftly took off in the decade after 1517, why did the Catholic monopoly remain in place in some locations while being overturned in others? Why did some of the likely candidates for the Reformation – from the perspective of the literature – remain Catholic while seemingly inhospitable cities and regions saw Protestants triumph? As Ekelund et al. (2006) observe, most demand-side theories over-predict the incidence of the overthrowing of the Catholic monopoly. So what explains Protestant success *and* failure?

III.2. Supply-side Channels of the Reformation

The remainder of this section summarizes recent work on the various causes of the Reformation, which go beyond conventional historical approaches. We delineate whether the primary focus of the work is supply- or demand-side, although many papers focus on both. We also highlight numerous other attributes of these works, such as their empirical strategy, unit of observation, and period covered. We briefly summarize these attributes in Table 1.

Table 1: Studies of the Supply and Demand-Side Factors of the Reformation

Channel	Study	Direction of Association	Unit of observation	N	Period of observation
<i>Supply-Side Factors Influencing Ideological Diffusion</i>					
Printing	Rubin 2014	+	Cities in HRE	352	1530-1600
Printing competition	Dittmar and Seabold 2015	+	German-speaking cities	191	1454-1600
Ottoman Incursions	Iyigun 2008	+	European conflicts	250	1450-1700
Ideological influence by spatial diffusion: <i>distance to Wittenberg/Zurich/Basel</i>	Rubin 2014	-	Cities in HRE	352	1530-1600
	Pfaff and Corcoran 2012	-	Cities in HRE	218	1523-1545
	Kim and Pfaff 2012	-	Cities in HRE	457	1523-1545
Ideological influence by spatial diffusion: <i>distance to Cologne/Louvain</i>	Kim and Pfaff 2012	-	Cities in HRE	457	1523-1545
Student enrollments to: <i>Wittenberg/Basel</i> (social diffusion)	Kim and Pfaff 2012	-	Cities in HRE	457	1523-1545
Student enrollments to: <i>Cologne/Louvain</i> (social diffusion)	Kim and Pfaff 2012	-	Cities in HRE	457	1523-1545
<i>Demand-Side Factors</i>					
Political Autonomy	Cantoni 2012	+	Cities in HRE	249	1517-1600
Political influence by spatial diffusion	Cantoni 2012	+	Territories and cities in HRE	370	1517-1600
Aristocratic Patronage	Kim and Pfaff 2012	+	Cities in HRE	457	1523-1545
Saints shrines	Pfaff 2013	-	Large cities in HRE	145	1517-1545
Primogeniture	Ekelund et al. 2002	-	European nations and territories	27	1524-1685
Agricultural potential	Curuk and Smulders 2016	+	Cities in HRE	249	1600
Monasteries	Pfaff and Corcoran 2012	-	Cities in the HRE	218	1523-1545

Among the most influential insights by historians is that the Reformation was an “urban event,” possibly caused by the rise of the free imperial cities in the HRE (Dickens 1972; Ozment 1975).⁷ There is some evidence to support this assertion: as previously noted, more than 80% of the free imperial cities either permanently or periodically accepted the Reformation (Ozment 1975). There are many reasons why cities provided useful breeding grounds for reform ideas, some on the supply-side (urbanites lived in close proximity to each other and thus had better access to information), and some on the demand side (urbanites had greater levels of wealth, literary awareness, and political sophistication).⁸ Yet, a potential problem with the “urban event” hypothesis is that “urban” correlates with other supply-side channels that were also important for the spread of the Reformation. Recent data-driven papers by economic historians and sociologists have sought to parse out these channels.

Rubin (2014) tests the role the printing press played in the spread of the Reformation. Rubin is hardly the first to suggest that the printing press played a key role in the spread of the Reformation; historian Bernd Moeller (1979: p. 30) puts it simply: “No printing, no Reformation.” Even Martin Luther himself noted that the printing press was “God’s highest and ultimate gift of grace by which He would have His Gospel carried forward.”⁹ The connection between printing and the Reformation is straightforward. The reformers made great use of printed propaganda, and in an age of high transport costs, having access to a printing press increased access to Reformation ideology, which spread through re-printing rather than shipping printed works. While it is true that literacy was limited, many texts included woodcut illustrations that quite vividly expressed Reformation themes, and the spoken word often magnified the power of printing in that itinerant preachers drew on Protestant pamphlets (Edwards 1994; Hanneman 1975; Scribner 1984). Therefore, there is reason to believe that the printed word was a powerful source of information transmission and ideological diffusion in this era despite low levels of literacy.

⁷ Free and Imperial Cities or Free imperial cities for short, were self-ruling cities that enjoyed a certain amount of autonomy and were subordinate only to the emperor, as opposed to territorial cities or towns that were subordinate to a territorial prince.

⁸ We should note, however, that free cities do not appear to have had political institutions conducive to long-term growth, as shown by Stasavage (2014).

⁹ For an excellent treatment of the role of printing in the Reformation, see Edwards (1994). Another excellent, though older, summary of Luther’s use of the printed words is Holborn (1942).

Rubin collected a host of city-level variables from 16th-century Europe and found that cities that had a press by 1500 were significantly more likely to adopt the Reformation. Yet, omitted variable bias likely affects Rubin's initial results: towns with greater pre-press literacy were probably more likely to have a press, and they may have been less likely to adopt the Reformation (due to the presence of churchmen, who made up a sizable portion of the literate population). Rubin addresses this issue by instrumenting for the spread of printing with the city's distance to Mainz, the birthplace of printing. Rubin's two-stage regressions show an even stronger effect of printing on the adoption of the Reformation: cities with a press by 1500 were 29 percentage points more likely to adopt the Reformation by 1600.

Dittmar and Seabold (2015) argue that there was a positive correlation between pre-Reformation competition among printers and Reformation adoption. The mechanism they propose connecting the two is that ideas were more likely to freely flow due to competitive pressures in cities without print monopolies. To test this hypothesis, they collect a large data set of city characteristics, the most important of which are thousands of German-speaking books and pamphlets published from 1454 to 1600. They "scrape" these printed works in order to determine the religious sympathies – Protestant or Catholic – of the author. They find that pre-Reformation competition among printers was especially important in cities under the rule of princes (i.e., those that were not free cities), presumably because ideas flowed more freely in free cities even in the absence of competition.

Iyigun (2008, 2015) makes a supply-side argument focusing on political economy considerations that limited the ability of the Church and its political allies to stop the spread of the Reformation. Iyigun's theory complements those based on the role of the printing press, as both argue for mechanisms that diffused the ideology of the Reformation to the point that it was impossible to contain. He argues that Ottoman incursions into Eastern and Central Europe – the Habsburgs only barely stopped the Turks at the gates of Vienna – diverted the resources of the HRE away from suppressing Protestants for just long enough so that the Reformation could become sufficiently entrenched in Germany. Iyigun is not the first scholar to make this connection – he cites nine scholars, writing as early as 1949, who made such a claim – but he is the first to test it empirically. He employs conflict data from 1451 to 1650, and shows that Ottoman conquests decreased the number of newly initiated conflicts among Europeans by 25 percent. The Ottomans therefore helped mitigate conflict between the Catholic Habsburgs and the early reformers as well

as Protestants and Counter-Reformers in the late-16th and early-17th centuries. Iyigun (2015) takes the argument one step further, suggesting that the “one true God” doctrine of monotheistic faiths meant that when people of different faiths came into contact, interfaith conflict would result (since only one side can be right), but intra-faith conflict – i.e., conflict between Christians – would be mitigated.

Kim and Pfaff (2012) provide an explanation for the spread of the Reformation based on relational diffusion. Their analysis includes a novel way to measure the influence of contending religious movements through university enrollments. They argue that the spread of university students from Protestant strongholds (Wittenberg and Basel, the intellectual homes of Luther and Zwingli) and orthodox Catholic strongholds (Cologne and Louvain) had a significant impact on whether a town ultimately adopted the Reformation. They show that ideologically mobilized students bridged the social distance between university centers and their hometowns and triggered religious contention. An analysis of hundreds of towns in the HRE shows that the greater a city’s exposure to heterodox ideology through city-to-university ties, the greater its odds of instituting the Reformation, net the political disposition of regional princes, spatial diffusion, and other controls. A one-unit increase in the logged number of students per 1,000 residents enrolled at Wittenberg or Basel during the period 1517-1522 nearly triples the odds that a town subsequently reformed. Links to leading orthodox universities similarly decreased a city’s odds of reform by 41% (Kim and Pfaff 2012).

III.3. Demand-side Channels of the Reformation

A few recent works consider demand-side factors of the Reformation. These factors affected the demand of the masses or rulers for an alternative to the established Church. Cantoni (2012) finds that princes were much more likely to bring the Reformation to their territory if their neighboring lord did the same. A one-standard-deviation increase in the fraction of neighboring princes who already adopted the Reformation led to a 17 percentage-point increase in the likelihood of adoption of the Reformation in the subsequent period. The intuition he proposes is that adopting the Reformation was risky for lords – especially given the Catholic sympathies of the Habsburgs, one of whom was emperor during Luther’s time. Thus, if powerful neighboring lords adopted the Reformation, it mitigated some of this risk. The spatial correlation of Reformation adoption highlighted by Cantoni also indicates why a city’s distance to Wittenberg (Luther’s intellectual

home) was so strongly and negatively correlated with Reformation adoption, a key fact exploited by Becker, Woessmann, and others to instrument for Reformation adoption in subsequent centuries (see Section 3).

Curuk and Smulders (2016) cite a demand-side argument based on the potential economic benefits the Reformation offered a territory. They argue that the Church enabled local rulers to perpetuate economic inefficiencies by legitimizing their rule and insulating them from revolt. Therefore, those places with the most to gain (i.e., those with the greatest inefficiencies) were most likely to adopt the Reformation, which meant throwing the Church out of power and reducing those inefficiencies. Using a data set of 66 cities for their main results and an extended data set of up to 249 cities, they find that cities with high agricultural potential but low populations (i.e., cities underperforming their economic potential) were likely to adopt the Reformation.

Another demand-side theory put forth by Pfaff (2013) suggests that cities with ancient Catholic shrines to saints were less likely to adopt the Reformation. His study is unusual among the empirical papers on the Reformation in that it includes a measure for specific religious practices. Pfaff's insights build on Swanson (1967), who showed a correlation between different late medieval political regimes and the likelihood of adopting Protestantism. These regimes varied in their emphasis in understanding of the role of God in the polity. In those regimes that favored an "immanent" understanding, society was both more hierarchical and more communally integrated through sacramental ritual. By contrast, the "transcendental" cultures were more individualistic and less hierarchical. Where the transcendental understanding predominated, the Reformation prevailed, cementing differences in the cultural constitution of societies that persisted for centuries (Swanson 1971, 1986). Swanson's theory seems almost unfalsifiable. What are the concrete indicators of differing cultural dispositions and communal organization? In considering the limits to Protestantism, Rothkrug (1980) posited that early Protestant inroads were resisted in areas where the cult of the saints was highly developed, such as in Flanders, the Rhineland, Bavaria, and Austria. His research found an "unexpected" negative correlation between the presence of shrines to local saints and the adoption of the Reformation. As is true of many historical studies, Swanson and Rothkrug's studies suffered from inconsistent units of analysis and reliance on bivariate correlations. Pfaff (2013) tested the cult of the saints hypothesis on a sample of 145 16th-century Central European cities. The study finds that, net of common economic and political control variables, shrines are associated with a decrease in a city's odds of adopting Protestantism,

suggesting that integration into the Catholic social order through the cult of saints was protective against Protestant reform.¹⁰

Ekelund, Hébert, and Tollison (2002; 2006, ch. 5) put forward the theory that people who demanded spiritual services were put on the margin of defection from the Catholic Church by its increasingly monopolistic practices. This permitted rival “firms,” such as Protestant churches, to enter into the religious-economy market and offer a less costly path to salvation. They suggest that demand for alternatives to the Church was particularly high in heterogeneous, emerging economic markets characterized by a less stable wealth distribution than the more homogenous rent-seeking societies. They test this assertion by showing that among the 27 regions in Western and Central Europe for which they have data, those with primogeniture laws were less likely to adopt the Reformation. They claim that this is a good test of their theory because primogeniture laws restricted property rights and the entrepreneurial impulse. In later work, Ekelund, Hébert, and Tollison (2004; 2006, ch. 6) argue that the Counter-Reformation was akin to the type of response one would expect from a monopolist facing entry: through violence and nominal doctrinal alterations, it attempted to increase rivals’ (i.e., Protestants) costs and lowered the price of its own good.¹¹

Pfaff and Corcoran (2012) also tackle the question of why religious monopolies can fail, and like Ekelund, Hébert, and Tollison test their hypotheses on the Reformation. Using a data set of 218 German cities, they find numerous demand side factors that explain why cities choose to disestablish which reflect combined motives of piety, economic development and the interests of princes. They find less support for Catholic market-entry barriers, reinforcing the impression that on the eve of the Reformation the Church was an enfeebled monopolist. However, they also find that the density of monasteries in a city decreased the odds of reform, suggesting that a city’s dependence on charitable institutions bolstered the Church. Pfaff and Corcoran also attempt to capture the influence of the contending Lutheran and Zwinglian wings of the early Protestant

¹⁰ In the wake of the Reformation, the Catholic Church responded to Protestant competition by canonizing more individuals and rationalizing the canonization process (see Barro and McCleary, 2016; Parigi 2012).

¹¹ As we have noted, the Counter-Reformation did not take shape as a coherent strategy until after 1545. The Catholic Church eventually made supply-side changes that bolstered its position, such as publishing of the translations of the authorized Vulgate Latin Bible into vernacular languages, improving the training of the clergy, and reforming and reinvigorating popular cults of the Virgin Mary, the saints, and the Sacred Heart.

movement by measuring a city's distance to either Wittenberg or Zurich, finding a strong negative association with the abolition of Catholicism.

IV. Consequences of the Reformation

The literature on the consequences of the Reformation covers a wide array of areas: institutions such as schools (and hence human capital accumulation), governance, economic development, media market competition, (work) ethic, anti-Semitism, and many more. There are far more recently published, data-intensive papers on the consequences of the Reformation than there are about the causes of the Reformation. This is quite natural for several reasons: while the factors leading to the Reformation may be manifold, from a statistical point of view, they are all factors explaining *one* event (even though, of course, the adoption and diffusion of the Reformation at the local level was a whole series of events). Second, papers on the causes of the Reformation generally look at variables measured in the decades just before the Reformation, so from a data perspective cover a shorter time period than papers on the consequences of the Reformation which look at outcomes in the immediate aftermath of the Reformation, but also centuries later, and hence cover a longer time horizon. Third, and most obvious, data from the 19th and 20th centuries are simply more plentiful and readily accessible than data from the 15th and 16th centuries.¹²

The consequences of the Reformation largely affected economic and political development in Europe and its offshoots. We therefore begin this section by detailing the consequences of the Reformation in Europe. Recent research largely confirms the Weberian insight that the Reformation played an important role in Europe's economic and political trajectory, although for different

¹² A recent strand in the empirical literature that we do not address directly looks at the effect of Christian missionaries on education and economic outcomes outside Europe. Pioneered by Woodberry (2004), researchers have looked at whether the presence of missionaries had long-term effects on modern-day outcomes. Gallego and Woodberry (2010) provide evidence that regions in former Colonial Africa in which Protestant missionaries dominated have higher literacy rates than those where Catholic missionaries dominated. Bai and Kung (2015) find that Chinese regions that had a higher rate of penetration of Protestant missionaries during the 19th century have higher rates of urbanization at the beginning of the 20th century Protestant missionaries are also associated with higher literacy in India, as shown by Mantovanelli (2014). Similarly, current health outcomes are better the closer a village is to historical Protestant medical missions (Calvi and Mantovanelli, 2016). Nunn (2014) looks at Protestant and Catholic missionary activity in Africa and finds that both had a long-term positive impact on education, although women profited more in Protestant areas. McCleary (2013) has cautioned against equating all forms of Protestantism as equally beneficial for human capital acquisition. In Guatemala, Evangelical, Pentecostal, and neo-Pentecostal denominations and churches focused their efforts on evangelizing, emphasizing eschatological urgency of conversion with little investment in human capital. Woodberry (2012) highlights the role Protestant missionaries played in influencing the rise and spread of stable democracy around the world. See Woodberry (2011) for an early survey on the literature on missionaries.

reasons than those espoused by Weber. Even where new research fails to uncover new findings, a characteristic of many of the papers surveyed in this section is that they use more data to understand general patterns whereas much earlier research looked at “case studies” in limited geographic areas or at a more geographically aggregated level. Studies that use hundreds of city-level or county-level observations are more likely to inform us about general findings than case studies.¹³

Tables 2-6 outline the papers we discuss in this section, providing information about many aspects of each of these studies (most of which are published), such as their period and unit of observation and the variable(s) of concern. Since many of these papers seek to pin down causality via instrumental variables, we also note the empirical methodology employed.

Table 2: Studies on the Consequences of the Reformation: Human Capital

Outcome	Study	(Expected) Direction of Association	Unit of observation	N	Period of observation	Empirical Method
Literacy rates	Becker and Woessmann 2009	+	Prussian counties	452	1871	IV
Gender gap in school enrollment and literacy rates	Becker and Woessmann 2008	-	Prussian counties	289 and 452	1816 and 1871	IV
Primary school supply and enrollment	Becker and Woessmann 2010	+	Prussian cities and counties	293 counties; 156 cities	1816	IV
Public spending on schooling; educ. performance of military conscripts	Boppart, Falkinger, Grossmann, Woitek and Wüthrich 2013	+	Swiss districts	169	1875-1879, 1885-1889, 1899-1903	IV
Capability in reading, numeracy, essay writing, Swiss history	Boppart, Falkinger, Grossmann 2014	+	Swiss districts	169	1875-1879, 1885-1889, 1899-1903	IV
Upper tail human capital	Dittmar and Meisenzahl 2016	+	German-speaking cities	239	1300-1820	IV

¹³ In our view, the benefit of learning from bigger samples exceeds the loss from giving less prominence to individual cases.

Table 3: Studies on the Consequences of the Reformation: Work and Work Ethic

Outcome	Study	(Expected) Direction of Association	Unit of observation	N	Period of observation	Empirical Method
Hours worked	Spenkuch 2016	+	Individual-level data; German Socioeconomic Panel	13,384	2000-2008	IV
(Referenda on) leisure, state intervention, redistribution	Basten and Betz 2013	-	Municipalities along Prot-Cath border in West Switzerland	305	1980s-2000s	RDD
Life satisfaction when unemployed	van Hoorn and Maseland 2013	-	Individual-level data from EVS and WVS	ca. 150,000	1981-2009 (5 waves)	Multi-level modeling

Table 4: Studies on the Consequences of the Reformation: Economic Development

Outcome	Study	(Expected) Direction of Association	Unit of observation	N	Period of observation	Empirical Method
Income tax revenue, % of labor force in services and manufacturing	Becker and Woessmann 2009	+	Prussian counties	452	1877, 1882, 1886	IV
City size/growth	Cantoni 2015	+	Cities in HRE	272	1300-1900	Diff-in-diff
City size/growth	Dittmar and Meisenzahl 2016	+	German-speaking cities	239	1300-1800	IV
Entrepreneurship among religious minorities	Nunziata and Rocco 2014	+	Individual-level data from ESS	ca. 9,000	2000s	Diff-in-diff
	Nunziata and Rocco 2016	+	Individual-level and district-level data from Switzerland	ca. 2 mi. indiv., 181 districts	2000s	Diff-in-diff
Social ethic	Arruñada 2010	+	Individual-level data from ISSP	19,246	1998/99	Ordered probit, OLS
Choice of secular university major & occupation	Cantoni, Dittmar, and Yuchtman 2016	+	Individual-level data; university matriculation records, biographies	ca. 30,000	Reformation period	Diff-in-diff

Table 5: Studies on the Consequences of the Reformation: Governance

Outcome	Study	(Expected) Direction of Association	Unit of observation	N	Period of observation	Empirical Method
Rise of Parliament as legitimizing agent	Rubin 2016	+	England and the Dutch Republic	Macro narrative	16 th and 17 th centuries	Macro narrative
	Greif and Rubin 2016	+	England	Macro narrative	16 th and 17 th centuries	Macro narrative
Rise of state system	Philpott 2000	+	European principalities	Macro narrative	1517-1648	Macro narrative
	Nexon 2009	+	European polities at regional and super-regional levels	Macro narrative	1517-1648	Macro narrative
Transnational advocacy	Stamatov 2010	+	Europeans religious organizations	Macro narrative	ca. 1550-1850	Macro narrative
Legal rationalization	Berman 2003	+	German principalities and England	Macro narrative	1517-1689	Macro narrative
Establishment of state churches	Gorski 2000	+	European states	Macro narrative	ca. 1520-1700	Macro narrative
Social discipline	Gorski 2003	+	Brandenburg Prussia and the Netherlands	Macro narrative	ca. 1550-1700	Macro narrative
Poor relief	Pullan 2005	+	European states	Macro narrative	ca. 1520-1650	Macro narrative
Social welfare regimes	Kahl 2005	+	Lutheran, Calvinist and Catholic confessional organizations	Macro narrative	ca. 1500-1800	Macro narrative
New institutions for canonizing saints	Parigi 2012	+	Canonization process of candidate saints	Macro narrative	1588-1642	Macro narrative

Table 6: Studies on the “Dark” Consequences of the Reformation

Outcome	Study	(Expected) Direction of Association	Unit of observation	N	Period of observation	Empirical Method
Witch trials	Leeson and Russ 2016	+	Witches in >10,000 trials across 353 European counties	43,000	ca. 1550-1700	OLS
Votes for Nazis	Spenkuch and Tillmann 2016	+	Counties in German Empire	982	1920s/1930s	IV
Anti-Semitism	Becker and Pascali 2016	+	Cities in German Empire	>2,000	1300-1900	Diff-in-diff
Suicide	Becker and Woessmann 2015	+	Prussian counties	452	1871 and 1816/21	IV
	Torgler and Schaltegger 2014	+	Swiss cantons	26	1981-2001	OLS
Suicide acceptability	Torgler and Schaltegger 2014	+	Individual-level data from EVS	ca. 19,000	1999/2001 (one wave)	OLS

IV.1. The Reformation and Human Capital

The nexus between religion and human capital is one of the most widely studied in the economics of religion (Iannaccone 1998; Iyer 2016). In the context of the Protestant Reformation, Becker and Woessmann (2009) argue that Luther wanted all Christians to read the Bible.¹⁴ A prerequisite for this, given low literacy rates around 1500, was to foster universal schooling in Protestant areas. Using data from all 452 counties in 1871 Prussia, Becker and Woessmann show higher literacy rates where Protestant shares were higher. The raw difference in literacy rates between all-Protestant counties and all-Catholic counties is 8 percentage points, a substantial difference considering that, in the average Prussian county, literacy rates were 87.51 percent. In order to establish causality from Protestantism to literacy, they instrument for the spread of the Reformation using distance from Wittenberg, the birthplace of the Reformation. They show that distance from Wittenberg does not predict pre-Reformation differences in education and economic development, giving support to their claim that the Reformation affected human capital acquisition and not vice versa. Differences in literacy rates in 1871 across Protestant and Catholic areas explain the differences in economic development, measured by proxies such as income tax revenues and the share of the work force in manufacturing and services. To the extent that the Protestant lead in education might have arisen only after the Industrial Revolution, a Weberian explanation could still hold. However, Becker and Woessmann (2010) show that Protestantism led to more schooling as early as 1816, well before the Industrial Revolution in Prussia. They conclude that their findings are more consistent with a human capital theory of Protestant economic history than with a Protestant (work) ethic à la Max Weber.

Dittmar and Meisenzahl (2016) emphasize the importance of church ordinances in fostering human capital accumulation. Less than 55 percent of cities that adopted Protestantism as their dominant religion established legal institutions (i.e. church ordinances) governing the provision of public goods such as schools. Using difference-in-difference regressions for 239 cities, Dittmar and Meisenzahl show that Protestant cities which formalized mass public education in the 1500s began producing and attracting more high-level human capital. This evidence builds on the *Deutsche Biographie*, a multi-volume collection of biographies of Germans who made a “significant impact

¹⁴ See also Becker and Woessmann (2011) for a more detailed overview of some of the work discussed in this subsection.

on developments in politics, economics, social life, scholarship, technology or the arts.” Information on place of birth shows that cities with church ordinances produced more famous individuals after the Reformation and attracted more high-skilled migrants who are identified by being born elsewhere but dying in a treated city. Their finding thus highlights that “implementing” the Reformation via legal changes was a key factor in fostering human capital.

In line with Luther’s request “that every town also had a girls’ school”, many Protestant towns opened girls’ schools alongside boys’ schools.¹⁵ Becker and Woessmann (2008) show that Luther’s desire for relative gender equality in education had long run effects. Their analysis of data from the 1871 Prussian census indicates that Prussian counties with larger Protestant shares not only had higher literacy rates on average, but also a smaller gender gap in literacy. In 1871 Prussia, literacy rates of Protestant males were 93.36 percent compared to 84.75 for Catholic males; those of Protestant women were 88.72 percent compared to 78.48 percent for Catholic females. Although increasing enforcement of compulsory schooling laws closed the gender-education gap in elementary schooling, it persisted in university enrollment until after WWII, when it was again smaller among Protestants than among Catholics.

Outside Germany, researchers have studied the long-run effects of the Reformation on education. Swiss Protestant reformers Huldrych Zwingli in Zurich and John Calvin in Geneva were equally keen to educate believers to allow them to read the Bible. Boppart, Falkinger, and Grossmann (2014) use data from 19th-century Switzerland collected from pedagogical examinations of conscripts in the military service. The standardized tests – aggregated at the district level for more than 160 districts – were compulsory for every male citizen and examined reading, essay writing, mathematics (written and oral), as well as knowledge of Swiss history and constitution. Their data allow them to study whether Protestants only excelled in reading or also in other disciplines. In order to exploit exogenous variation in the share of Protestants in a district, they use the shorter distance of a district from either Zurich or Geneva as an instrumental variable. Their key finding is that while the Protestants showed the largest advantages with respect to reading capabilities, they also did better on other cognitive tests.¹⁶

¹⁵ Green (1979) shows this for the Electorate (*Kurfürstentum*) of Brandenburg based on parish visitation documents in the first decades after the Reformation.

¹⁶ For instance, in IV regressions, Protestants are 18 percentage points more likely than Catholics to get the top test grade in reading while the gap is only 9 percentage points in history.

Boppart, Falkinger, Grossmann, Woitek, and Wüthrich (2013) analyze whether the effect of Protestantism on education varies with the degree of conservatism in the district. They measure conservatism with voting results of three historical federal referenda: on easing restrictions for civil marriage held in 1875, on the “Factory Law” which imposed work regulations, including the prohibition of child labor in 1877, and on the re-introduction of the death penalty in 1879. They find that Protestantism is only beneficial for educational spending and for test results of military conscripts in 1875-1903, when individuals are in a conservative environment, but report that it makes no difference in a progressive environment.¹⁷

The studies just discussed suggest that there is some direct connection between Protestantism and human capital accumulation, at least in central Europe. These well-identified studies account for most possible avenues of spurious correlation. More research is necessary to test these connections outside of central Europe, although identification issues are more difficult to address; historically, there was less local variation in the Catholic and Protestant shares of the population in the rest of Western Europe and its overseas offshoots.¹⁸ Nevertheless, these studies suggest a possible mechanism connecting Protestantism to long run economic development unrelated to Weber’s Protestant “ethic.”

IV.2. The Reformation and the Protestant (Work) Ethic

Other researchers look at outcomes that explicitly try to capture a Protestant (work) ethic. Spenkuch (2016) uses micro-data from the German socioeconomic panel, which shows longer work hours and higher earnings for Protestants in contemporary Germany. To address the potential endogenous spread and conversion to Protestantism, he exploits the fact that the geographic distribution of Catholics and Protestants today largely reflects that found at the time of the Peace of Augsburg in 1555. At Augsburg, the Imperial Diet famously agreed on the principle of “whose rule, his religion” (*cuius regio, eius religio*) whereby local rulers decided the religious affiliation on behalf of their

¹⁷ Also in this paper, Boppart and co-authors use the minimum of the distance to Zurich and Geneva as an instrumental variable for the share of Protestants at the district level.

¹⁸ It is useful to remember that there was not one Reformation as a worldwide event, but instead region- or country-specific Reformations. Hence, while distance to Wittenberg may be a useful instrument in the Prussian context, and distance to Geneva and Zurich in the Swiss context, those instruments do not lend themselves when it comes to understanding the (non-)adoption of the Reformation outside Germany and Switzerland. In fact, in many countries with more centralized rule, the whole country switched to Protestantism (e.g. Sweden) or resisted this change (e.g. Spain).

citizens. Spenkuch shows that Protestants do indeed work harder (i.e., longer hours) than Catholics, suggesting that there may be some credence to Weber's "Protestant ethic" hypothesis after all.¹⁹

Basten and Betz (2013) address the Weber hypothesis using data from Switzerland. They concentrate on the area in western Switzerland that is comprised of the present day cantons of Vaud and Fribourg. This area split in two prior to the Reformation. The city republic of Fribourg came to rule the Eastern part, whereas the Western part fell to the city Republic of Berne. During the Reformation, the Fribourg part remained Catholic and the Berne part adopted the new faith. Using a regression-discontinuity design and votes in federal referenda during the late 20th century, they show that Protestantism reduces referenda voting for more leisure by 14 percentage points, which is consistent with Weber's theory regarding the effect of Protestant doctrine on labor-leisure tradeoff preferences.²⁰ Van Hoorn and Maseland (2013) take a different approach to testing Weber's Protestant work ethic hypothesis. They test whether unemployment negatively affects well-being of Protestants more strongly than that of Catholics. Using data on 150,000 respondents from the European and World Values Surveys (EVS and WVS), they find that Protestants' satisfaction drops an additional 40% when unemployed.²¹

What the studies in this and the previous subsection show is that human capital has been highlighted as a prime competing hypothesis for the differential economic success of Protestants and Catholics. However, that does not necessarily mean that a Weberian Protestant (work) ethic thesis is outright wrong. In fact, there is evidence for Germany and Switzerland, as well as from cross-country regressions, that Protestants work more hours, have less of a preference for leisure and suffer more displeasure when they are unemployed, all of which are consistent with the idea that Protestants (want to) work harder.

¹⁹ In IV regressions, Protestantism induces individuals to work approximately 3.5–4.5 hours (or one third of a standard deviation) more per week, thereby raising earnings by 14-17 percent.

²⁰ Siroky, Mueller, and Hechter (2016) suggest that this split plays a role in modern politics, too. In a 2013 referendum, the people of Jura Bernois (a French Protestant region loyal to German Protestant Berne) voted against joining the predominantly French but Catholic canton of Jura. They suggest that religious legacies were the salient deciding factor, dominating even common language.

²¹ Note that this study presents correlations with clear endogeneity issues, and does not attempt to address these issues with IV or a related technique.

IV.3. The Reformation and Economic Development

The economic advantages Protestants held over Catholics are the basic starting point for Weber's Protestant ethic hypothesis. Young (2009) addresses the relationship between Protestantism and growth with Maddison's GDP data from 1500 to 2000 for 15 European countries. He shows that Protestant countries overtook the leading Catholic countries in the centuries following the Reformation, and the income gap showed no signs of convergence until the 1960s. While this paper is largely descriptive, it is one of the few studies to employ cross-country data from 1500 through the present to study the relative performance of Protestant and Catholic countries. Young's (2009) findings contrast with those of Delacroix and Nielsen (2001), who concentrate on the development of industrial capitalism in European countries in the mid- to late-19th century. Their results are mixed: they 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. They do not, however, find a relationship between the share of 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, or infant mortality circa 1850. Comparing particular cases, they point to overwhelmingly Protestant countries that were notable laggards in capitalist development (the Nordic countries) and overwhelmingly Catholic countries that were early developers (Belgium, France).

The difficulty of disentangling the effect of religion from other possible fundamental causes of economic prosperity, such as institutions and geography, plagues any cross-country study. By contrast, looking at regional data within the same country is more likely to condition on such factors that vary less within a country than between countries. For instance, using subnational data from Prussia, Becker and Woessmann (2009) confirm Weber's casual observation, documenting that Protestant counties were better off in Weber's homeland of Prussia in the late 19th century. Protestant economic advantages over Catholics extended to numerous domains including income tax receipts, the share of the work force in manufacturing and services, and teacher incomes.

Cantoni (2015) gathered data from 272 cities in the Holy Roman Empire during the years 1300-1900 to determine whether Protestant advantages persisted in the very long run. Cities are important in their own right, since innovation and development of capitalism are likely to be particularly relevant in urban centers. His measure of economic growth is city growth – a widely

used proxy in the pre-modern context. Using a generalized differences-in-differences setup, he finds no effects of Protestantism on economic growth.²²

Dittmar and Meisenzahl (2016) further sub-divide the set of Protestant cities into cities that formalized the Reformation in Church ordinances. They find that cities that adopted legal change grew at least 0.1 percent faster per year than both Protestant cities that did not formalize social change in municipal law and Catholic cities. In 1800, those cities were thus 26 percent larger than cities not formally instituting the Reformation. In order to address endogeneity of adoption legal change, they employ an instrumental variable strategy using plague outbreaks in a narrow window in the early 1500s as an instrument for institutional change. They control for long-run differences in plague prevalence across cities, which may reflect differences in openness and locations, and use the variation in plague outbreaks during the critical juncture of the early 1500s for identification.²³

Other studies examine entrepreneurship as an economic outcome. Nunziata and Rocco (2014) look at individual-level data from the European Social Survey (ESS) from the 2000s to study the nexus between religion and rates of entrepreneurship. Their identification rests on the idea that individuals belonging to a religious minority show stronger adherence to their denomination's principles, so they compare rates of entrepreneurship of Protestant minorities across Europe to those of Catholic minorities. They find that Protestants in Catholic-dominated regions (i.e., where Protestants are a religious minority) are five percentage points more likely to be entrepreneurs than Catholics in Protestant-dominated areas. Nunziata and Rocco (2016) reach similar conclusions looking at individual-level and district-level data from Switzerland. They find that minority Protestants in Switzerland are about three percentage points more likely to be entrepreneurs than minority Catholics.

Arruñada (2010) proposes another twist on the Weberian hypothesis, suggesting that the distinguishing feature of Protestantism was its social ethic. He argues that Reformers were more supportive of secular political and legal institutions than were Catholics, often because they needed political help in their fight against Catholicism. He also suggests that Reformers placed less emphasis on the role of the family and instead wanted Christians to treat strangers equally well. He

²² This finding coincides with that of Becker and Woessmann (2009) when they restrict their analysis to city counties only.

²³ The identifying assumption is that variations in outbreaks in the early 1500s were random, conditional on long-run prevalence.

employs evidence based on cross-country survey data from the International Social Survey Programme (ISSP). His results are consistent with the idea that Protestantism is conducive to capitalist economic development, not by the direct psychological route of the Weberian work ethic, but rather by promoting an alternative social ethic that facilitates impersonal trade.

Most of the above-cited papers, except for Dittmar and Meisenzahl (2016), focus on the long-run effects of the Reformation, seeking to understand differences that arose centuries after the Reformation. This is understandable, since data from the 19th and 20th centuries are much better and much more widely available than data from the 16th century. Fewer studies have sought to understand the shorter-run effects of the Reformation on economic outcomes. One exception is Cantoni, Dittmar, and Yuchtman (2016), who are interested in how the Reformation affected the choice of majors for university students in the immediate aftermath of the Reformation. They argue that the closure of monasteries created uncertainty over future employability with a degree in theology, and suggest that young men therefore switched away from theology to other degrees such as law, with potentially important consequences for state formation and growth in Protestant territories.

IV.4. The Reformation and Governance

The formation of the early modern state is largely a story about the centralization of state functions and institutions (at least among those states that survived), as increasingly bureaucratic monarchies took over military, judicial, and revenue collection duties from noble estates and local authorities (Pfaff and Kiser 2003). In this process, the arrangements made by centralizing rulers could either lay the foundations for autocracy and economic stagnation or create a pathway to constitutionalism and growth. Marxist historians argue that absolutist monarchies arose to prop up the feudal mode of production and its dominant class (Anderson 1974). One contemporary position is a neo-Weberian “bellicist” theory that contends that war made states; as technologies of warfare developed in the late medieval era, the costs of war ballooned and the ability to extract revenue and field large armies became a necessary condition for state survival (Downing 1992; Ertman 1997; Mann 1986; Tilly 1990). More recently, social scientists have begun to consider the role that social and cultural

variables played in the evolution of the state and interest in the religious and institutional upheavals of the Reformation era has grown accordingly.²⁴

Politics was one area where the Reformation had an immediate and obvious impact. Where the Reformation took hold, the ruling elite evicted the Catholic Church from power. This fundamentally altered the makeup of city councils, parliaments, and royal councils. Political scientists and sociologists have long viewed this as one of the most important long-run effects of the Reformation. However, economists until very recently have not addressed the Reformation's impact on European political economy and its economic consequences in that domain. Consequently, no study that we know of has collected a large data set with the intention of studying the long-run economic effect of the Reformation via the political-economy channel; this is certainly one of the lowest remaining hanging fruits in the social science study of the Reformation. The studies overviewed in this section either are theoretical, use analytic narrative techniques in a limited number of cases, or employ sparse data in support of the proposed theory.

Rubin (2016) argues that the Reformation was the culmination of a long divergence in the coalitions that propagated rule in Western Europe and the Middle East. Following the Reformation, Protestant rulers could no longer depend on the religious elite for legitimacy and thus turned to parliaments to support their rule and provide them revenue. Rubin makes the case that parliaments generally had interests more aligned with long-run economic development than the religious elite, such as protection of property rights, provision of public goods (especially transport networks), and investment in trading companies. This helps explain why England and the Dutch Republic took off, soon after their Reformations, but Catholic Spain and the Muslim Ottoman Empire lagged behind in spite of their military and territorial dominance. Greif and Rubin (2016) use the concept of legitimizing agents to shed light on the role that religion played in the English Civil Wars of the 1640s and the Glorious Revolution. They argue that the key change in England's governance arose during the Reformation, when Henry VIII brought the Reformation to England via acts of Parliament. They contend that an unintended consequence of Henry VIII's actions was a change in

²⁴ A large literature has recently appeared in economics on non-religious reasons for the emergence of early-modern states. Much of this literature dates to Charles Tilly (1975, 1990), who argued that governments invested in revenue generation once war became expensive and the interests of the elites with respect to mutual defense were aligned. Tilly's (1975, p. 42) oft-cited statement is "War made the state, and the state made war." Besley and Persson (2009, 2010) and Acemoglu (2005) extend this argument. They suggest that common interest in public good provision sparked endogenous investments in fiscal capacity. See Dinicecco (2009), Karaman and Pamuk (2013), and Gennaioli and Voth (2015) for further nuance related to this argument.

the manner in which the English monarch derived legitimacy: after the Reformation, a legitimate monarch followed the laws imposed by Parliament and in return received legitimacy and resources. Their theoretical model and analytical narrative suggest that the Civil Wars and the Glorious Revolution resulted from attempts by the Stuart monarchs to revert to the old legitimacy principal of a monarch ruling by Divine Right, which meant a much smaller role for Parliament in governance.

Philpott (2000) also argues that the Reformation transformed the political order of Europe, although he suggests a different channel than Greif and Rubin. According to Philpott, Reformation ideas and the wars of religion determined the state system that emanated from the Westphalian Peace in 1648. The Augsburg Peace of 1555, with its "*cuius regio, eius religio*" was a stepping-stone in achieving the fuller sovereignty of territorial princes, with less direct intervention or majority rule in the HRE at large. Nexon (2009) is unconvinced. Departing from the view that the Reformation birthed the modern nation-state system, he sees a much more complex and dynamic set of political forces emerging from the Reformation era. He contends that religious differences emerging from Europe's Reformations altered the exercise of power by introducing religious motivations that competed with economic and political interests. Transnational religious movements, which involved a "cross-class network surrounding beliefs and identities," instigated a crisis in the state system by raising the costs of rule in heterogeneous, composite political communities. Employing network concepts and historical case studies, Nexon (2009) shows how religious networks overcame institutional barriers that had kept political resistance to empire local and complicated indirect-rule strategies.

Hence, beyond the confessional state, one of the most consequential political outcomes of the Reformation may lie in the creation of new kinds of religiously motivated social movements. If Nexon (2009) is right, then the shadows of these developments continue to affect the exercise of rule in composite states and the international response to political crises as evidenced by contemporary political Islam and the wars in the Middle East and North Africa. Drawing on case studies, Stamatov (2010) argues that long-distance political advocacy became an institution of the international system because of activist organizations created to advance the interests of religious groups. During wars of religion in the 16th and 17th centuries, activist networks first lent support to their co-religionists, as with the transnational Protestant support for the Dutch rebellion against the Habsburgs or the cause of the French Huguenots. Across confessional lines, this expanded both globally and sociologically, as European empires reached overseas, with the targeted beneficiaries

of advocacy (such as Abolitionism) now including “distant strangers” – morally sympathetic groups beyond religious group boundaries.

Berman (2003) argues that the Reformation affected Europe’s political trajectory through its effect on law. He regards the Protestant Reformation as resulting in nothing less than a “revolution” in legal thinking and institutions. Luther and his followers rejected the medieval dualism of church and state, proposing instead the doctrine of the “two kingdoms,” which limited the church to spiritual affairs and unified government under the power of the prince. When taken up by legal reformers, urban magistrates, and territorial rulers, they created the bases for integrated bureaucracies and legal formalism that provide the foundation of the “civil service state” characteristic of modern Northern and Central Europe. Contra Weber, Berman argues that it was not so much a Protestant ethic that spurred capitalist development, but rather the new “capitalist communitarianism” that flowed from the Protestant reorganization of the state and had, as its concrete manifestations, the legal institutions of the joint-stock company and the modern law of trusts.²⁵ Berman’s analysis raises numerous testable predictions that, to our knowledge, researchers have not analyzed systematically. For instance, is modern-day civil service administration traceable to developments that took place during the Reformation? Did the legal institutions that emerged in the wake of the Reformation have any long-run impact on economic growth, and how does this relate to the legal origins of these societies (as in La Porta et al. 1998, 2008)?

Gorski’s (2000, 2003) work on the social and political implications of the Reformation favors a more radical interpretation of its effects on governance. He regards the Reformation as having “tightened linkages between religious and political elites and institutions” (Gorski 2003: p. 171). Taking up the theme of “confessionalization” developed by Schilling (1988), Gorski identifies the period between the middle of the 16th and the middle of the 17th centuries as an era in which rulers attempted to enhance state power through the newly established Protestant churches. According to Gorski, princes used the new churches to enforce social discipline so as to regulate the population, enhance its industriousness, and inculcate willing obedience. The clergy’s participation

²⁵ Witte (2002) contends that, outside the economic sphere, Protestant legal innovations were less revolutionary. Whereas Lutherans were eager to abolish the canon law, there was no adequate substitute in existing civil law. Rather than develop radically new institutions, they cleverly synthesized existing canon law with the civil law of the cities and territorial states. Despite the confessional agenda of the reformers, the secular law of the princely states had strong continuities with ecclesiastical institutions, particularly as regards marriage and family law, education, and social welfare.

in this project reflected its greater dependence on secular rulers following the Reformation, as well as competitive pressures that drove the new pastors to educate and socialize the flock into strong confessional loyalty. Gorski's case studies of the Netherlands and Brandenburg-Prussia suggest why Calvinist practices were more intensive and transformative in their potential than what was possible in Lutheran and Catholic polities. He presents historical evidence which shows not only that the administrative performance of these lands improved, but also that the Calvinist confessional state markedly reduced violence, illegitimacy, and indigence. Gorski's work therefore has testable implications: did Calvinist polities enjoy better administration than non-Calvinist polities in the decades and centuries following the Reformation? Were the socio-economic outcomes Gorski points to – such as declining violence and indigence – part of preexisting trends or actually the result of religious ethics? Were they generally lower in Calvinist polities outside of the ones Gorski studies? If so, was this due to better religious administration, or was there some other factor that would make this relationship spurious?

Gorski's (2003) study has further implications for understanding bureaucratization in early modern states by linking confessionalism with low corruption. With corruption seen as religiously objectionable and not only a matter of state, churches became willing to enforce those rules and religious authorities became an indirect control mechanism on behalf of the state. This part of Gorski's argument provides additional evidence for a general causal argument developed in economics and political science on third party monitoring (Weingast 1983; Keiwiet and McCubbins 1991; North 1990, ch. 6-7). In the case of Prussian tax administration, at least, Kiser and Schneider (1994, 1995) argue forcefully against Gorski's (1995) thesis that Calvinist ethics account for Prussian efficiency, stressing instead how specific deviations from bureaucratic norms resolved principal-agency conflicts in favor of the crown.

In a comparative and historical examination of ideas about poverty and almsgiving across traditions, Kahl (2005) argues that modern attitudes toward poverty relief and the institutional response are inheritances of the confessional age. Whereas Catholics emphasized the nobility of the poor and the morality of private charity, Protestants stigmatized poverty and saw it as an individual failure. Nevertheless, Lutherans and Calvinists differed in their theological and institutional responses. Consistent with Luther's teaching that the state has both a spiritual and practical obligation to the common good, the predominantly Lutheran societies developed the generous, universal anti-poverty measures for which social-democratic welfare states are famous.

Predominantly Calvinist societies favored industriousness and self-improvement, developing ungenerous, means-tested and market-oriented welfare institutions. Less likely to regard poverty as a social problem, Catholic societies favored decentralized, collectivist, overlapping and private responses to poverty, often organized and delivered by the clergy.²⁶ These insights have implications for comparative welfare state researchers, who could test the influence of religious ideas on historical welfare-state formation, as well as how religious ideas may influence the institutions of emerging welfare states in developing economies.

The Reformation transformed Catholics too. One of most innovative recent study of these transformations explains how the Church “rationalized” miracles in order to reinvigorate the cult of the saints. Protestant competition induced Catholic officials to develop new institutions to govern candidacy for sainthood. Employing social-network analysis of the canonization process, Parigi (2012) shows how the Church combined bureaucratic certification of the authenticity of miracles with advocacy by crosscutting social networks of laypeople lobbying in favor of their candidates. Over the long run, the resulting institutions both enhanced quality control and more tightly bound Catholics to the Counter-Reformation Church. As with the studies by Nexon (2009) and Stamatov (2010), the social consequences of the Reformation become evident in new forms of association and political mobilization through religious networks.

Social scientists need to test more thoroughly the claims of studies that argue for the importance of the Reformers’ struggles for state-formation and economic development before generalizing such claims. Did Protestant states really have the transformative effects that case studies of particular countries suggest? Historical studies suggest that there is good reason to be skeptical that the reforming theologians and rulers who sought to remake societies realized their ambitions at the local level (Karant-Nunn 1979, 1987; Strauss 1978; Witte 2002). Social scientists are only beginning to explore the regional and subnational variation in institutional development and its effect on economic development. This is a promising avenue for research with broader implications for the comparative study of development.

²⁶ Poor relief in the aftermath of the Reformation is also the focus of Pullan’s (2005) work. He argues that Protestants initiated this kind of welfare reform. Poor laws originated in the Protestant parts of Germany during the early 1520s and spread northwards, with financing coming from the closure of monasteries. The Catholic princes of Southern Europe resisted these new practices of poverty relief as the closure of monasteries was not an option in their lands.

IV.5. The Dark Shadow of the Reformation

Although the effects of the Reformation on education, work ethic, and economic development seem to paint a largely positive picture, other research has highlighted both short-run and long-run “dark sides” of the Reformation. Weber (1905) noted sinister consequences of the Reformation, speaking of the cultural legacy of the Protestant ethic in terms of an “iron cage” of secularization, alienating materialism and narrowly instrumental thinking. Generations of historians have debated whether Luther’s nationalism and his ethics demanding subordination to state authority disposed Germany toward authoritarianism and intolerance. One version of this thinking perceives strongly path-dependent consequences of Lutheranism in Germany’s “special path” (*Sonderweg*) to modernization, which putatively privileged a strong state and economic coordination over liberalism and free markets (Blackbourn and Eley 1984; Kocka 1999; Maier 1998; Wehler 1997).²⁷ Another version of this thinking traces a particularly virulent, “eliminationist” anti-Semitism to Luther’s nationalism and obsession with the failed effort to convert the Jews to Protestantism (Goldhagen 1996; Browning 1998).

Sweeping historical claims such as these suffer from being over-generalized, poorly construed and rarely tested using systematic evidence. Recent work by social scientists appears to be examining the issue of possibly baleful consequences of the Reformation much more carefully. Leeson and Russ (2016) study European witch trials in the two centuries after the Reformation, c.1550-1700, that involved the prosecution of over 80,000 persons for witchcraft and claimed the lives of no less than half of them. They argue that witch trials reflect non-price competition between the Catholic and Protestant churches for religious market share in confessionally-contested parts of early modern Christendom. They provide empirical evidence that witch trials were more frequent in areas with more Protestant-Catholic conflict.

Becker and Pascali (2016) identify a change in the geographic pattern of anti-Semitism associated with the Reformation. Using a difference-in-differences framework in a study of more than 100 cities with printing presses, they document a shift in printing with anti-Semitic content towards Protestant cities in the decades immediately after the Reformation. They further document

²⁷ In this sense, perhaps one could trace another legacy of the Reformation in the contemporary literature on “varieties of capitalism” in political economy. In this school of thought, scholars have presented a post-war Central European model of coordinated market economies based on social consensus and a corporatist integration of capital and labor in which the state plays a leading role (Hall and Soskice 2001).

a relative shift in anti-Semitism from Catholic cities to Protestant cities in Germany after the Reformation, throughout the 16th to the 19th centuries. They argue that this finding relates to the Catholic ban on usury, which gave Jews living in Catholic regions a specific advantage in the money-lending sector. Protestant views on usury were less restrictive. Consistent with the idea that inter-religious complementarities play a role, they find the most pronounced Protestant-Catholic gap in anti-Semitism in those cities where Jews had already established themselves as moneylenders before the Reformation – a finding consistent with the larger degree of by then well-established Catholic-Jewish occupational complementarities.

Spenkuch and Tillmann (2016) study a longer-term effect of the Reformation, looking at how Protestantism may have influenced the rise of the Nazi party during the Weimar Republic. They use the same instrument employed by Spenkuch (2016), the district's religious orientation following the Peace of Augsburg of 1555, to establish a causal connection between Protestant population share and Nazi vote share. Because Catholics had their own party, the *Zentrumspartei* (Center Party), which was firmly rooted in the middle of the political spectrum, Protestants ended up voting more for both the left and right ends of the political spectrum. Protestant churches contributed to the rise of the Nazi party by staying politically neutral and not discouraging parishioners from voting for an extremist party.

Emile Durkheim highlighted another dark side of the Reformation in his 1905 book *Le Suicide*, where he observed a higher suicide propensity of Protestants compared to Catholics across regions and countries. Becker and Woessmann (2015) empirically test the Durkheim thesis using Prussian county data. They show that Protestantism is indeed associated with much higher suicide rates. In IV regressions where the share of Protestants in a county is instrumented with distance to Wittenberg, they find that a 10 percentage-point increase in the share of Protestants in a county increases the suicide rate by 2.0 to 2.4 suicides per 100,000 inhabitants. Seen against an average suicide rate of 13.0 per 100,000 inhabitants across Prussian counties, this is a substantial effect. Torgler and Schaltegger (2014) confirm this result at the subnational level in Switzerland, using data for 26 Swiss cantons. In OLS regressions, they find a one standard deviation larger share of Protestants is associated with a 0.14 standard deviations higher suicide rate. These being OLS estimates, they are not directly comparable with the IV estimates in Becker and Woessmann (2015).

V. Taking Stock of the New Empirical Reformation Literature

The renewed focus on empirical studies of the Reformation suggests three general observations. The first is that long-lasting social and cultural upheavals are possible when a confluence of supply-side features coincide to permit challengers to the old regime to become sufficiently entrenched. Demand for reform existed for centuries prior to Luther. However, the reformers of the early 16th century were successful for several reasons having to do with timing and setting. These reasons include recent advances in information technology (the printing press); outside threats (the Ottomans) that sidetracked the attention and resources of the papacy and Habsburgs; the heterogeneous and decentralized nature of the HRE; and networks of sympathetic university students and intellectuals placed in strategic locations throughout the HRE. These features point to an interaction between luck, timing, and geography that are typical of massive social movements – and make them hard to predict. Yet they also point to general features that are common to such movements: economic changes that alter popular demands, technologies that permit coordination, widespread networks of potential sympathizers, and favorable political conditions. In recent history, the failure of Soviet-style systems to adapt to the information revolution and computer-assisted automation was a factor in their economic decline at the same time that reception of Western broadcasts was making it harder to isolate these countries from international developments (Ekiert 1996; Kotkin 2010; Kuran 1995; Pfaff 2006). In the Arab spring, new digital technologies made it harder for authoritarian polities to control information and made it easier for dissidents and popular movements to coordinate against authoritarian regimes (Howard 2010; Shirky 2011; Weidmann 2015).

This literature's second general lesson is that religion can influence long-run economic outcomes. This is not necessarily in a Weberian sense of value orientations, but rather in that religious institutions and religious doctrines affect a host of variables that are important for economic growth, including human capital, governance, entrepreneurship, social ethic, social networks, and missionary work. The literature suggests that each of these variables were encouraged by Protestantism ideology. Finally, the new literature points to a host of new mechanisms connecting the Reformation to positive economic outcomes. Where the Reformation took hold, it fundamentally altered political, legal, and social institutions, resulting in the ascendancy of parliaments, the secularization of law, increased emphasis on education, and the

precursors of the welfare state. The long-run economic effects of the Reformation are therefore only understandable when considered in conjunction with their associated institutional changes.

Even so, there was also a dark side to Protestant ideology – Protestant share of the population correlates with a host of evils, including Nazi vote share, suicide, anti-Semitism, and witch persecutions. Have social scientists biased our understanding of events like the Reformation by seeking out their beneficial effects? Have scholars too often assimilated the putatively progressive features of the Reformation into a master narrative of the “rise of the West”?

VI. Future Directions

Whereas empirical work on the long-run effects of the Reformation has seen significant growth, considerably fewer studies have focused on the short-run (during the first decades after 1517) and medium-run effects (before the onset of the Industrial Revolution). For these periods, further digitization of individual-, city- and county-level historical sources could yield insights on various important issues, including how networks between supporters (and enemies) of the Reformation formed, how they operated, and what legacy they left. Many of the long-run effects found in the literature must have worked via short-run channels. Digging deeper into the shorter- and medium-run effects of the Reformation could provide important falsification tests for those works claiming the Reformation entailed long-run socioeconomic effects.

In recent decades, historians have dispelled the impression that the Reformation was a single European-wide event driven by a few charismatic individuals and carried by a coherent, theologically inspired movement. Rather, historians refer to Europe’s plural *reformations* (Brady 2009; Cameron 2012; Hendrix 2004; Lindberg 1996; MacCulloch 2005; Tracy 1999). The many local studies by historians have laid the ground for research that combines disaggregated data with attempts to discern general patterns. This will allow social scientists to take on new questions. For example, some Protestant countries had famous Reformers at the head of popular religious movements (Calvin and Zwingli in Switzerland, John Knox in Scotland), but in other countries the Reformation either never gained substantial popular traction or was imposed from above as a prerogative of princes. Empirical research could explain the sources of this variation and shed light on the processes through which the Reformation took hold in various polities. For social scientists the question of why Protestant movements gained widespread support in some areas and not in others is an important one.

As for the long-run consequences of the Reformation in Europe, the vast majority of studies concentrate on Germany and Switzerland. We suspect that more research is feasible using micro-regional data from England and Scotland, the Netherlands, Poland, and the Austro-Hungarian Empire, all of which ended up, during or after the Reformation period, with sizeable populations of different confessional groups. Some of these regions had natural experiments imposed upon them by border changes, forced population movements, or Communist governments, any of which might be useful for causal identification of outcomes. For example, the boundaries of western Poland changed numerous times throughout its history. Many of these cities, such as Wroclaw and Szczecin, were part of the HRE in the 16th century and became Protestant, while nearby neighboring cities remained Catholic. Parsing out the effects of the Reformation from the many other historical influences that affected socioeconomic outcomes in this region is not simple, but previous work on Germany and Switzerland suggests that it is possible.

Besides data and digitization, additional tools such as network analysis might help to shed light on the causes and workings of the Reformation and help us to understand how it spread beyond Germany. Many of the studies we discussed refer to diffusion processes – diffusion is usually the latent concept underlying the case for instrumental variables analysis using proximity measures. Social networks should influence the diffusion of ideas and institutions through mechanisms such as information flows, the exercise of influence, and the capacity of groups to coordinate. Recent studies on the Reformation and its consequences are beginning to make explicit use of network concepts and methods (Kim and Pfaff 2012; Parigi 2012, Nexon 2009). Future research could do more to specify the concrete structural factors, agents of diffusion, and the relational structures underlying the rise, spread, and adoption of the Reformation. The use of network methods is expanding across the social sciences (Carrington, Scott and Wasserman 2005; Granovetter 2005; Ward, Stovel, and Sacks 2011) and these can be adapted to historical and comparative research in spite of the obstacles sometimes presented by historical data (Erikson and Bearman 2006; Gould 2003; Hillmann 2008; Weatherell 1998). The concurrence of more historical social scientists gaining familiarity with network concepts and methods alongside the digitization of historical materials will increasingly facilitate the collection of network data, opening up new and promising areas of research.

To this point, social scientists have largely relatively neglected the institutions and long-run consequences of the Catholic Counter-Reformation, even though historians suggest that Counter-

Reformation activities in fields such as education, the arts, and administration were critical features of state formation in polities such as the Habsburg monarchy (Evans 1979; Heal 2007; Kann 1974; Soergel 1993). As the eminent Central European historian R.J.W. Evans (1979: 191) declared, “Austria is depicted as the guardian of Catholic orthodoxy, whereas in fact it was Catholic orthodoxy which created Austria.” There are many interesting research questions that would benefit from further investigation, including how the Counter-Reformation operated; what the balance was between “hard” (e.g., the Inquisition) and “soft” power (e.g., schooling and Baroque culture); and how effective the Counter-Reformation Church was, particularly in terms of state capacity and economic performance. The role of Ignatius Loyola and the Jesuit Order in the reorganization of education and the establishment of new higher schools and universities is an especially important area that deserves greater scrutiny. Were the economic consequences of Jesuit institutions comparable to – and as long lasting as – Protestant educational reforms (as argued by economic historians)? If the ideological content of religious ethics is less important than their consequences for human capital formation, then the practices and consequences of the Counter-Reformation Church demand greater scrutiny. Perhaps further research will reveal that Protestant and Catholic confessional differences in areas such as human capital formation and state capacity have been overstated. Future work might continue to explore if Protestantism influences economic development through attitudinal, institutional, or human-capital mechanisms in countries where it has been widely adopted in Africa, Latin America, and Asia.

The Protestant Reformation is a vivid example of how institutional changes in society can have profound consequences for economic and political development. Weber’s Protestant ethic thesis was pioneering in its exploration of how religious transformation could set in motion unintended consequences for economic development. Whereas empirical studies have largely invalidated the specific claims of Weber’s thesis, his work has been important for generating an ongoing research program that is shedding new light on Western economic history and may have implications beyond it. We expect the literature on the causes and consequences of the Protestant Reformation to continue to thrive for years to come. The digitization revolution affecting economic and social history (Abramitzky 2015; Mitchener 2015) is likely to lead to exciting research, using “big data” and previously unmined source material to answer many of the open questions in the Reformation literature.

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