Faithful Strategies: How Religion Shapes Nonprofit Management

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Abstract

This paper studies the strategies employed by Catholic and Protestant nonprofit hospitals in Germany and traces them back to the theological foundations of those religions. Using a unique dataset, we find that Catholic nonprofit hospitals follow a strategy of horizontal diversification and maximization of the number of patients treated. By contrast, Protestant hospitals pursue a strategy of horizontal specialization and focus on vertical differentiation, putting in more sophisticated inputs and producing more complex services. These effects increase if the environment of a hospital gets more competitive. We present a model that rationalizes the strategic differences as a result of the difference between Catholic and Protestant values identified in the literature. We then test alternative explanations to the observed empirical differences and show that none of them is supported by the data.

Keywords: nonprofits; not-for-profit sector; religious values; religious organizations; Catholicism and Protestantism

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1 Introduction

The nonprofit sector accounts for 5.5 percent of GDP and 9.2 percent of all wages paid in the United States (The Nonprofit Almanac, 2012).[1] Nonprofits have been widely recognized as an important part of the economy (Hansmann, 1980, Hatten, 1982), especially in industries such as health care, child care, nursing homes, charities, or social work (Francois, 2007).

From an organization theory perspective, two main factors distinguish nonprofit from for-profit organizations: They have tax privileges and they operate under a nondistribution constraint.[2] While tax privileges give nonprofits a financial advantage over competing for-profits, the nondistribution constraint makes it unlawful that nonprofit managers or other decision makers appropriate the profits generated by this advantage (Hansmann, 1980).[3] Hence, rational nonprofit decision makers will not maximize profits but pursue another objective. It has not been settled in the theoretical literature, however, which one. Similarly, empirical studies comparing the economic outcomes and strategic decisions of nonprofit, for-profit, and public organizations do not find a clear pattern of behavior distinguishing organizational forms (Sloan, 2000; Malani et al., 2003; Horwitz and Nichols, 2007).

Here we employ an insight articulated in the behavioral strategic management and law & economics literatures to better understand the relevant objectives driving decision making in nonprofit organizations and, thereby, to better predict such decisions. Decision makers, such as managers, directors, or board members, do have an own identity and own values—and these values influence their decisions (Andrews, 1980, Hambrick and Mason, 1984, Hansmann, 1996). The importance of such values may be particularly pronounced in nonprofit organizations because the governance structure in most nonprofits allows decision makers more discretion than

[1] Worldwide, nearly 19 million people were employed in the nonprofit sector in the 22 countries studied by the Johns Hopkins University Comparative Nonprofit Sector Project in 1998, making it a U.S.$1.1 trillion industry (`http://www.newswise.com/articles/worldwide-burgeoning-nonprofit-economic-sector`). In Germany, 9.2 percent of all employees work in the nonprofit sector, which contributing 4.1 percent of GDP (Rosenski, 2012).

[2] Glaeser (2003:1) adds a third feature, that nonprofits do not have owners. That notion applies Hansmann's (1996) definition of ownership, whereby an owner is a person having both residual control rights *and* residual income rights in a firm.

[3] Note that public organizations and cooperatives are not only different from for-profits but also from nonprofits because they are not subject to a nondistribution constraint.

in for-profit firms: although supervision is not completely absent, there are no shareholders with high-powered incentives monitoring them and restricting their strategic choices (Glaeser, 2003).[4]

But which values may be important enough to influence the actions of professionals making decisions on behalf of entire organizations? Schneider and De Meyer (1991) point at the significance of national cultures for perceptions and attitudes. One of the most fundamental dimensions of culture, which has been found to shape organizational attributes, is religion (Boone et al., 2012). As early as 1970, the significance of "The Religious Manager" was realized in management scholarship (Senger, 1970). Tracey (2012) and Chan-Serafin et al. (2013) note that the last decades have seen a rise in the importance of religious beliefs and practices for today's organizations in most of the world.

Therefore, we develop and test the idea that the values governing a nonprofit organization that is affiliated with a specific religion will influence the firm's strategies in the market. Thereby we contribute both to the behavioral strategy literature, to the understanding (and predictability) of nonprofit organizations, and to knowledge about the consequences of religion.

2 Nonprofits, religious organizations, and faith

2.1 Decision makers in nonprofits

In the economics literature, it is commonly accepted to assume that for-profit firms maximize profits, and nothing else. The story goes that managerial opportunism and other agency problems exist but that, at least for publicly-held corporations, a governance structure with shareholders supervising managers and the market for corporate control mitigate deviations from profit maximization (Jensen and Ruback, 1983). In management, Andrews (1980:74) went a step further towards formulating realistic assumptions of decision makers' behavior: "Executives in charge of company destinies do not look exclusively at what a company might do and can do. [...] they sometimes seem heavily influenced by what they personally *want* to do"

[4]Chin et al. (2013) find that even in publicly-listed firms managerial values influence actions.

(italics in original). Moreover, "[i]n examining the alternatives available to a company, we must henceforth take into consideration the preferences of the chief executive" (p.77).

Hambrick and Mason (1984) introduced the notion that even managers of publicly-traded corporations make choices through highly individualized lenses that are formed by the managers' experiences, personalities, and values—the famous upper echelons perspective. Consequently, even if the legal and economic corset of managers in public corporations were as tight as taken for granted by economists, it would be conceivable to assume that those experiences, personalities, and values are reflected by the firm's decisions, which are taken under uncertainty and hence require the managers to make individual judgements under incomplete information. Therefore, it should not come as a big surprise that the upper echelons perspective and related theories underlining the role of the identity of decision makers for their firms' actions, such as the work of Hansmann (1996), have found lots of empirical support (see, for instance, Thomsen and Pedersen, 2000, or Finkelstein et al., 2009).

Most of these studies have considered the role of managerial personalities and experiences. The impact of managerial values for strategy has received much less attention. Hosmer (1994) underlines the positive, trust-enhancing effects of ethical management for company performance, which is related to managing according to religious values. Agle et al. (1999) identify the link between managerial values and corporate social performance. In a related study, Marquis and Lee (2013) analyze the characteristics of senior managers that shape their philanthropic views and thereby influence the philanthropic contributions of their firms. Shu et al. (2012) investigate the impact of religious beliefs at the location of the university attended by a fund manager on the fund manager's risk-taking behavior. Noussair et al. (2013) follow a related route by studying risk-taking behavior of Catholics and Protestants in a representative sample of the Dutch population. Chin et al. (2013) include managers' political attitudes as determinants of their firms' corporate social responsibility activities. Senger (1970) shows that there is not only a link from religious values to observable actions but also from religious values to the

perception of others' actions: he reports that the objectives and perceptions of subordinates of the managers in his sample were related to their religiosities.

These articles study for-profit firms, mostly publicly-listed corporations. Decision makers' objectives in nonprofit organizations, despite their large social and economic relevance, are still understudied. Nonprofits offer a particularly promising field to study the strategic ramifications of personal values and beliefs: First, in most nonprofits decision makers face more relaxed governance constraints than in publicly-traded corporations because a self-interested monitor with high-powered incentives is missing (Glaeser, 2003, Herbst and Prüfer, 2016). This gives them more discretion in decision making. Second, due to the nondistribution constraint, a natural, simple objective with straightforward metrics—namely profit-maximization—is missing. Instead, nonprofits are often required to cater to complex and sometimes ambiguous objectives laid down by the founders of the organization (Stone and Brush, 1996).

This underlines the importance of the manager's values and beliefs for strategic decisions in nonprofits.[5] In turn, the values of appointed decision makers depend on the organization's governance structure. If the organization is affiliated with a certain social or religious group, the group can foster its values by selecting managers that hold the same values. Given that many different groups with many different values exist, studying nonprofits "in general" and striving to find one unique objective for all nonprofit organizations, must fail necessarily.

Not surprisingly, Malani et al. (2003:181/2) conclude, "[t]here is no accepted theory of NFP behavior, and little of the empirical work is connected to—let alone compares—existing theories." Horwitz and Nichols (2007:3) confirm this negative finding: "there is no generally accepted theory of the nonprofit firm". In a meta-study on US hospitals, Eggleston et al.

[5]Horwitz (2007) analyzes data from the 1990 U.S. Census and from the American Hospital Association's (AHA) Annual Surveys of Hospitals, which includes information from almost every urban, acute-care hospital in the country (approximately 2,500 hospitals per year) from 1988 through 2000. She compares for-profit and nonprofit hospitals and concludes that different hospital types systematically offer different services according to their profitability. Hence, she contributes to the literature showing that ownership does matter for strategic decision making in hospitals. When speculating about the reasons for the results found, she notes that "the evidence presented here is also consistent with the influence of employee altruism" (p.24). She does not, however, go further and attempt to study where such altruism may come from, whether the group of nonprofit hospitals could (and should) be divided in more homogeneous subcategories, or whether there are different directions of impact for the subcategories' altruism (let alone to discuss the role of religious beliefs).

(2008:1345) conclude: "Whether studies find for-profit and government-controlled hospitals to have higher mortality rates or rates of adverse events than their nonprofit counterparts depends on data sources, time period, and region covered. [...] The 'true' effect of ownership appears to depend on institutional context, including differences across regions, markets, and over time."

To understand regular behavior of nonprofits better, we argue that we have to subdivide organizations operating under the nonprofit label into smaller, more homogenous groups, where each group is characterized by a unique objective function. Prüfer (2011) discusses such an approach but only studies one subgroup, so-called consumer-dominated nonprofits. He does not connect the hypothesized organizational form with observable organizational characteristics, which makes it hard to test predictions on the behavior of consumer-dominated nonprofits empirically. Therefore, the challenge we are facing is to operationalize our theory of nonprofits, which posits that several types of nonprofits exist and which regards the values—and hence the identity—of decision makers as crucial: we first need to identify observable characteristics of subgroups of nonprofits, which allows us to infer the values and objectives of key decision makers in each subgroup (without claiming that the line of distinction we identify is the only one possible). Based on these objectives, we then have to come up with a model of how nonprofits with different decision makers make different strategic decisions. Finally, we have to test the predictions generated by the model empirically.

To tackle the first task, we have a closer look at the time horizon that nonprofit decision makers have in office. If a nonprofit was founded by an individual, it seems natural that the organization's mission specified by the founder gets less weight in the decision making process after the founder retired or passed away. Instead, the objectives of other stakeholders, for instance donors, consumers, or elite workers, are likely to become more important. The balance of powers within such a nonprofit is likely to fluctuate over time, however, depending on the wealth of the organization and the outside options of the individual stakeholders (Glaeser, 2003). Because it is hard to specify at a given point in time who is the key decision maker in a specific

nonprofit, it is even harder to hypothesize this or that objective function governing important decisions in such an organization independent of time.[6]

In contrast, if a nonprofit was founded by another organization and is under constant supervision of the parent organization, we may expect that the parent's mission has a persistent impact on the nonprofit's objective function. One example for such long-lasting parent organizations is given by churches. Hansmann et al. (2003:48/9) note: "Like public hospitals, religiously affiliated hospitals have an owner of sorts, [...] the church, that both exercises control over them and stands to benefit from economies achieved in the hospitals' operation."

2.2 The economic effects of Catholic and Protestant values

Odom and Boxx (1988) are among the first management scholars to study the behavior of religious organizations. They find that the importance of environmental factors used in churches' decision-making procedures are related to the level of planning sophistication. Demerath and Schmitt (1998) called for a more serious treatment of religious institutions by scholars of complex organizations. Miller (2002) studies the sources of sustainable competitive advantage of religious organizations in a theoretical article, drawing both on scholarship from economics and sociology. Rennhoff and Owens (2012) show that churches in two suburban Nashville, Tennessee, counties, employ different strategies in the market, which are affected by the decisions of other churches. Boone et al. (2012) point at the importance of religion as a fundamental category of identity and association and show that religious pluralism is correlated with organizational diversity.

Studies distinguishing between religious and secular nonprofit organizations could identify significant differences in behavior between these groups. Hansmann at al. (2003) find that for-profit hospitals are the most responsive to reductions in demand, followed by public and religiously affiliated nonprofit hospitals, while secular nonprofit hospitals are the least responsive of the four ownership types they studied. Gertler and Kuan (2009) find that, when entire

[6] Larrain and Prüfer (2015) and Prüfer (2016) endogenize membership in (nonprofit) business associations and show how sensitive the objective of the pivotal member is to little changes in the environment.

nonprofits are sold in the US hospital industry, religious nonprofits discount only to other religious nonprofits while nonreligious nonprofits discount to all nonprofits, suggesting a trade-off between religious values and monetary income.

These articles indicate that one reasonable line of distinction between subsets of nonprofit organizations is along the religious-secular dimension. But we can go further. King and Haveman (2008) study the differential impact of this-worldly and other-worldly religious theologies in the early-19th-century U.S. on the support for the antislavery movement. They demonstrate a direct link from specific religious teachings via organizations that are driven by these teachings on institution building—an approach we follow, too.

As long as "religious nonprofits" are treated as one group, it is difficult to come up with *one consistent* objective for the entire group. If we zoom into the spectrum of religious nonprofits, however, this is possible. Among Christian denominations, Catholic and Protestant values differ in key aspects, which may reflect the strategies of nonprofit managers affiliated with those denominations.

We focus on these two denominations and neglect other Christian denominations because our data refer to German hospitals. Baumann (2007:144) explains: "Due to historical reasons and specific privileges for the main churches, i.e. Protestantism and Roman Catholicism, it certainly is justified to speak of a 'limited pluralism´ in both Germany and Switzerland [...]. In numerical terms, in 2003 two thirds of the 82.5 million inhabitants of Germany were members of the two main Christian churches. The second largest group, so to say, was constituted by people with no formal religious adherence, comprising some 26 percent."[7]

According to Barro and McCleary (2005:1337), Germany has had no state religion throughout the 20th century. In Eastern Germany, "the government [even] promoted "scientific atheism" to reinforce opposition to standard religion" during the communist period, 1945-1990 (p.1344)

[7]Baumann (2007, ch.2) explains the historical roots of religious homogeneity in Germany in detail. "Following the Enlightenment and its praise of reason, and the industrial revolution causing inner-state migrations, the hitherto mono-confessional dominance [of Catholicism] changed to a bi- or dual-confessional landscape, [... where...] Roman-Catholics and Protestants lived together, though mainly in different districts" (p.141).

– which explains lower religious affiliation rates in Eastern Germany today. Moreover, there are more Catholics in the South and West and more Protestants in the North and East of Germany. The ideologically distant relationship between the German state and religions still holds today: the state actually supports all acknowledged churches administratively, for instance by collecting church taxes from their self-reported members on their behalf and forwarding them to the respective churches. But the state is agnostic regarding the teachings or beliefs of churches and does not discriminate between them once they are officially acknowledged as a religion. There is no reason to expect that the state plays any different role in the decision making processes of the Catholic church as compared to the Protestant church or its affiliated organizations.

Both major churches operate huge welfare organizations, employing hundreds of thousands people: the Catholic *Caritas* and the Protestant *Diakonisches Werk*. Notably, all organizations affiliated with religions are subject to specific labor laws in Germany, which require their employees to align their own actions with the religious beliefs of the relevant church (*loyalty duties*).[8] Resigning from the church or behaving in a way that is incompatible with the teachings of the church—as interpreted by their superiors in the hierarchy of the church, not in the specific organization/hospital they work for—is a reason for dismissal. Therefore, managers of religious hospitals in Germany have little leeway to depart from the values of their respective church. This justifies to assume *one* objective function per denomination in the model below.[9]

The economic consequences of Christian doctrines have gained great attention since at least Max Weber's "work ethic" hypothesis, that the Protestant Reformation was instrumental in

[8]When setting a "basic order of church employment," *Caritas* (2011: Art.1) writes: "All persons active in the Catholic church, independent of their legal position in the organization, contribute jointly to enable their employing organization in fulfilling its share of the church's mission (service community). All involved persons, employers, managing and executive staff members, have to acknowledge and to take as basis of their actions that the mission and operation, organizational structure and management of their employing organization have to align with the religious and moral doctrine and with the legal order of the Catholic church." Along similar lines, *Diakonisches Werk* (2014, esp. sections 8 and 9) argues that the church's right to ask her employees for special loyalty duties in Germany derives from the "constitutionally anchored right of church self-governance" and is confirmed by §9.2 of the General Act on Equal Treatment, "which follows European law."

[9]Despite the strong indirect constraints of religious teachings, direct constraints are limited. Caritas writes: "What unifies them [people working for Caritas] is working based on the Christian idea of man and serving people in need. Managerial decisions and personnel matters are always taken by the ones in charge locally and not steered by some centralized corporate headquarters." (translated from German original at `http://www.caritas.de/diecaritas/transparenz/faq/ist-die-caritas-nicht-laengst-ein-konzern`).

facilitating industrial capitalism—and economic prosperity with it—in Western Europe (Becker and Woessmann, 2009). Recent literature has studied the channels through which differences between the Protestant and Catholic doctrines led to the observed economic differences between regions with this or that dominant denomination. Glaeser and Glendon (1998) model the costs and benefits of the Calvinist belief in predestination and find that under many conditions predestination is a more socially efficient belief system. Van Hoorn and Maseland (2013) report that, in their sample of almost 150,000 individuals from 82 societies, they find strong and robust support for the hypothesis that both individual Protestants and historically Protestant societies appear to value work much more than Catholics and Catholic societies.

Arrunada (2009) confronts the work ethic hypothesis with an alternative "social ethic" hypothesis, according to which Protestant values shape individuals to be more active in mutual social control, more supportive of institutions, less bound to close circles of family and friends, and to hold more homogeneous values. He finds no support for the hypothesis that Catholics work less or less effectively than Protestants but identifies that education has a differential impact in both denominations: "[F]or Protestants education complements religion whereas for Catholics education substitutes for religion" (891). This result is related to Glaeser and Sacerdote (2008), who find that education in the United States is positively correlated with church attendance at the individual level but negatively across denominations. This means that the less educated Christian denominations attract more believers to church but that, within each denomination, the more educated believers are more often at church than the less educated ones. The differential interaction of education and Christian denominations is underlined by Glaeser and Glendon (1998:442), who find in their study of U.S. General Social Survey data "that there is a greater connection between education, which we use as a proxy for worldly success, and church attendance among Protestants, especially Presbyterians, than among Catholics."

Becker and Woessman (2009:581) show that Weber was right in his observation that Protestant regions were economically more affluent than Catholic regions (across countries in 1900 and

within Prussia in the second half of the nineteenth century). However, they reject the hypothesis that the higher economic development of Protestant regions was based on differential work ethics. Instead, they postulate and test a "human capital theory," according to which an unintended side effect of Martin Luther's 16th century call that everyone should be able to read the Bible, Protestants acquired literacy skills that functioned as human capital in the economic sphere. Consequently, "a simple economic model predicts that when optimizing individual utility, in equilibrium Protestants will have more education on average than Catholics because they have lower costs and higher benefits of schooling" (541). Underlining the differential role of education in the Catholic and Protestant denominations, their results provide empirical support for the fact that Protestantism led to a better educated population than Catholicism.

We conclude from these results that Protestant organizations can be expected to have a higher inclination towards *education* (and therefore to institutions of education) and to the use of modern, more complex technologies than those managed by Catholic organizations.

In addition to education, there is another dimension of values where Catholic and Protestant decision makers can be expected to differ. In their careful meta-study on nonprofit objectives, Malani et al. (2003:182/3) conclude, "if forced to choose among existing theories, we would select theories which argue that the distinctive behavior of nonprofit firms can be explained by the *altruistic* motives of these firms' principals as most consistent with available evidence" (italics added). This judgement is in line with Senger (1970) and Hosmer (1994) and reflects recent studies about the role of altruism and prosocial preferences—especially by workers—in the delivery of social services in nonprofits (Francois, 2003, Besley and Ghatak, 2005, Francois and Vlassopoulos, 2008, Delfgaauw et al., 2011, and Dur and Zoutenbier, 2011). Importantly, prosocial motivation of decision makers can lead to the overproduction of services, which may be at odds with efficiency (Francois, 2007).

Lam (2006:179) summarizes religious studies research: "Although both Catholicism and Protestantism promote altruism and the pursuit of the common good, the value orientation of

each religion might favor a different course of action." She contrasts "the individualist emphasis of Protestantism" and "the communal emphasis of Catholicism" and confirms that the "Catholic-Protestant difference in value orientation has been documented in the cross-national research on the support of social welfare" (179).[10] Arrunada (2009:908) concurs: "Catholic moral standards may increase transaction costs in impersonal trading but also make personal trade easier."

Lam's characterizations are also reflected by sociologists. Schwartz and Huisman (1995:88) state that Catholics are more likely than Protestants to emphasize values such as respect for tradition and *communal* bonds, whereas Protestants are more likely to give priority to *autonomy and freedom*" (italics added). Sanchez-Burks (2002) proposes a *Protestant Relational Ideology* (PRI), according to which a deep-seated belief rooted in Protestantism (especially in Calvinism) is that affective and relational concerns are considered inappropriate in work settings and, therefore, are to be given less attention than in social, non-work settings. He explains that, according to PRI, "relational concerns ought to be put aside at work in order to direct one's attention to the task at hand. To be productive and efficient is *prima facie* to leave personal issues and emotional sensitivity at the office door" (Sanchez-Burks, 2004:266).

Importantly, the behavioral consequences of religious values are not necessarily perceived to be religiously-rooted by the believers themselves: "As with the Protestant Ethic in American society, where the sentiment that people have a moral obligation to work is no longer explicitly linked to one's calling or predestination [...], so too the PRI is not assumed to be linked explicitly to religious teachings. Rather, subtle cues about focusing on the task, not relationships while working are expected to be more common in socialization practices [...] rooted in Calvinism" (Sanchez-Burks, 2004:277). Combining these "subtle cues" with the above-reported "loyalty duties" of the managers of Christian hospitals in Germany and the resulting, indirect impact of

[10]The Protestant *Diakonie* states in its mission statement: "We orient our actions toward the Bible. We appreciate the *individual* human being" (emphasis added; translated from German original at `http://www.diakonie.de/leitbild-9146.html`). By contrast, the Catholic *Caritas* underlines in their "guidelines for labor contracts:" "Organizations that are affiliated to the German Caritas Association serve the *communal* act of Christian charity. Employer and employees constitute a *service community* and contribute jointly to the fulfilment of the organization's tasks" (emphases added; translated from German original at `http://www.caritas.de/glossare/dienstgemeinschaft`).

churches' teachings, suggests that the influence of religious values also works in a subtle, indirect way and does not need to be articulated explicitly at the hospital level.

We conclude that the direction of Protestant and Catholic altruism is different. The individualist emphasis of Protestantism puts the relationship between the believer and God central and abstracts from the social environment. In work settings, the Protestant is expected to behave professionally, not emotionally and to treat everybody in the same way, *ceteris paribus*. In the context of hospitals, this translates into choices that balance a patient's treatment benefit and the associated treatment cost but exclude concerns about the effects of treating this patient onto others. By contrast, Catholic altruism appears to be more compassionate. The importance of communal bonds and the relatively stronger inclusion of (merciful) emotions suggests that, in the context of hospitals, a Catholic decision maker takes the effects of her decisions not only for a patient to be treated now and here but also for the community of patients into account.

Summarizing, the following relative impact of Catholicism and Protestantism evolves, which we will use in the mathematical model in the subsequent section: First, both Catholicism and Protestantism value altruistic behavior (*lat. caritas*). Hence, the objective function of managers of either denomination should increase in patient benefits. Second, whereas Protestantism has an individualist emphasis and, thereby, a Protestant decision maker can be expected to maximize the benefit of an *individual* patient, the communal emphasis of Catholicism suggests that Catholic decision makers focus on the group benefit of *all* patients. Third, a Protestant believer obtains high reward from measures of worldly success, such as high education. This suggests that Protestant decision makers will be oriented more towards productive efficiency and attracted by complex procedures and technologies, two economic and intellectual measures of success.[11] These differences are the key drivers of our model, which is inspired by Ellis (1998) and which we will use to translate the three theological cornerstones of Catholicism and

[11]Productive efficiency refers to a situation in which an economy could not produce any more of one good without sacrificing production of another good. In the context of hospitals, this implies to make decisions that maximize the net surplus per patient, that is, patient benefit minus treatment cost. Note that this is different from profit maximization, which maximizes revenue minus cost.

Protestantism identified here into testable hypotheses.

3 The Model and Empirical Hypotheses

3.1 A caring monopolistic provider

Patients are characterized by a severity of illness, $s \in \{1, 2\}$. There is a unit mass of patients at each severity level. Each patient demands one unit of services. Without treatment, a patient gets zero utility. If treated, a patient gets utility $B = B(X(s))$, where $X(s)$ is the level of services received at severity level s and:

$$B(0) = 0, \frac{\partial B(\cdot)}{\partial X(s)} > 0, \frac{\partial^2 B(\cdot)}{\partial^2 X(s)} < 0 \tag{1}$$

Hence, patients' utility increases in the level of services received but every additional unit of service is less valuable than the previous one. Patients are assumed to be fully insured, such that they do not take treatment costs into account when deciding about whether to seek treatment, or not (see Footnote 13). However, patients bear a travel cost to reach the provider. Hence, the market may not be completely covered. Demand increases in patient benefits:

$$N = N(B(X(s))); \frac{\partial N(\cdot)}{\partial B} > 0 \tag{2}$$

Because of (1), demand also increases in the level of services provided:

$$N_X \equiv \frac{\partial N}{\partial B} \frac{dB}{dX} > 0 \tag{3}$$

To keep the model as simple as possible, we consider a monopolistic provider offering services to the patients. Assuming competition between providers would not change the actions of a Catholic *relative to* a Protestant provider. In Section 3.3 we study the effects of competition

on our results. We assume that the production of higher intensity of services gets more and more expensive and that a higher severity level increases the marginal treatment cost. To produce service intensity $X(s)$, the provider incurs a per-patient cost $C(s, X(s))$, where:

$$C(s,0) = 0, \frac{\partial C(\cdot)}{\partial X(s)} > 0, \frac{\partial^2 C(\cdot)}{\partial^2 X(s)} \geq 0, C(1, X(s)) < C(2, X(s)) \quad \forall X > 0 \tag{4}$$

Since 2004 German hospitals have operated under a fully prospective payment system, which is called "dual financing" (Simon, 2010, ch.8).[12] Current operating expenses are borne by patients or their health insurers. In contrast, investment expenses may not be charged to patients but are funded by taxes (§4 KHG). These public funds have decreased in the past decades, however, and only accounted for 4% of all hospital expenses in 2007. "By far the largest share of hospitals' costs—in total more than 90%—are financed from reimbursements that hospitals charge patients or their insurance companies for provided services" (Simon, 2010:294).[13] Therefore, we model a fully prospective payment system, where the provider receives a lump-sum payment, $R(s)$, from an insurer for each patient that depends upon the patient's diagnosis s at time of discharge but does not depend on the level of services $X(s)$ received:

$$R(s=1) < R(s=2) \tag{5}$$

The provider's profit per patient of severity level s is therefore:[14]

$$\pi = R(s) - C(s, X(s)) \tag{6}$$

[12]The relevant laws are the Hospital Financing Act (*Krankenhausfinanzierungsgesetz*) (KHG, 1972) and the Federal Regulation on Hospital Care Rates (*Bundespflegesatzverordnung*) (BPflV, 1973).

[13] There is compulsory basic health insurance, which covers all "medically necessary" treatments of patients (excluding most plastic surgery, for instance). Private health insurers compete with (semi-)public insurers but the coverage of all basic insurance packages is regulated. Patients can buy additional insurance, for instance to get treatment by head physicians or to stay in single rooms when hospitalized. See also Busse and Riesberg (2004). In the model, we focus on the general, basic insurance. It follows that treatment prices, $R(s)$, are not of direct concern to patients but flow between health care providers and insurers.

[14]Maximizing (6) w.r.t. $X(s)$ shows that a profit-maximizing provider would set $X^*(s) = 0$ (or to the minimal level acceptable to a health care regulator).

We study a one-stage game looking for a unique Nash equilibrium, that is, a situation where every decision maker, depending on her objectives, takes a utility-maximizing decision and, depending on others' decisions, has no incentive to change behavior. The provider announces an intensity of services $X(s)$ for each severity level, and demand and payoffs are realized.

Based on the previous section, we consider a nonprofit decision maker who cares both about patient benefits and treatment costs. We assume that the budget constraint is not binding at a decision maker's preferred severity level, such that the provider can actually produce her most preferred service intensity, $X^*(s)$. Note that, if the budget constraint was indeed binding there, namely if $R(s) \leq C(X^*(s))$, both decision makers would set the same service intensity, where $X^* = \{X|R(s) = C(X(s))\}$. Then the decision maker's objectives were less relevant for the decision taken. But as the purpose of this model is to construct empirical hypotheses that differ across nonprofit types, we focus on the interesting case without a binding budget constraint.

We consider a governance structure where the decision maker has to hold the same religious beliefs as the nonprofit board members, which is in line with the usual hiring procedures in religiously affiliated hospitals in Germany, as explained above. Therefore, we assume that the decision maker's objectives are shaped by the respective religious values.

Let the decision maker's indirect utility from treating one type-s patient:

$$v(s, X(s)) = B(X(s)) - C(s, X(s)) \tag{7}$$

This captures the decision maker's altruism—she cares about patients' benefits—but also that she maximizes productive efficiency: treatment costs reduce her utility.[15] As a rational decision maker never chooses $X(s)$ such that $v(\cdot) < 0$, we restrict attention to situations where:

$$B(X(s)) \geq C(s, X(s)) \tag{8}$$

[15] In the words of Francois and Vlassopoulos (2008), the provider is characterized by "action-oriented" or "impure" altruism because v is an increasing function of the provider's effort, $X(s)$. See Besley and Ghatak (2005) for a related model of action-oriented altruism. These models differ from "pure" or "output-oriented" altruism (Francois, 2007), where v would be an increasing function of B even if B was exogenous to the provider.

Based on Section 2, decision maker $j \in \{C, P\}$ maximizes the following objective function:

$$Max_{X(s)} \quad V_j \quad = \quad \sum_{s=1}^{2} \left[B(X(s)) - C(s, X(s))\right] N^{\rho}(B(X(s))), \tag{9}$$

where $\rho = 1$ if the provider is Catholic (C) and $\rho = 0$ if the provider is Protestant (P). This implies that, for Protestant nonprofits, $V_P = v(s, X(s))$: the decision maker cares about the benefit of the *one* patient who is up for treatment. Note that the irrelevance of demand in the Protestant's objective function does not imply a limited *understanding* of market forces. She only cares more about treating her current patient than the next patient. In contrast, a Catholic gets reward from maximizing the benefits of *all* patients net of treatment costs, thereby focusing on the community of patients rather than on one individual. Another interpretation is that a Catholic perceives some collective-level benefit that is neglected by Protestants.

3.2 Analysis

If $\rho = 0$, it follows that $N^{\rho} = 1$. Thus, for a Protestant decision maker, the solution of (9) is:

$$X_P^*(s) = \{X | B_X(X(s)) = C_X(s, X(s))\} \quad \forall s \tag{10}$$

$X_P^*(s)$ corresponds to the individually efficient service intensity, which equalizes the patient's marginal benefits and marginal treatment costs.

If $\rho = 1$, the First-Order Condition (FOC) of (9), for every s, is:

$$[B_X(X(s)) \; - \; C_X(s, X(s))]N(B(X(s))) \quad = \quad -[B(X(s)) \; - \; C(s, X(s))]N_X(B(X(s))) \tag{11}$$

By (8), the RHS of (11) is negative. Hence:

$$X_C^*(s) = \{X | B_X(X(s)) < C_X(s, X(s))\} \Rightarrow X_C^*(s) > X_P^*(s) \tag{12}$$

The equilibrium service intensity of a Catholic decision maker is strictly higher than the one of a Protestant decision maker.[16] The reason is that the Catholic partly internalizes that a marginal increase in the service intensity not only benefits one patient but attracts another patient at the margin. Treating the marginal patient, too, yields the Catholic additional utility. Therefore, we find a positive *demand effect* of caring for one's community. Given that the Protestant provider's service intensity satisfies productive efficiency at the individual patient level, (12) implies that the Catholic provider overproduces service intensity, thereby decreasing the net treatment benefit per individual patient, $B(X(s)) - C(s, X(s))$.

Combining (2) and (12) produces the following proposition.

Proposition 1 (Equilibrium Demand) *Provider P attracts less patients than provider C:*

$$N_C^*(s) > N_P^*(s) \Rightarrow \sum_{s=1}^{2} N_C^*(s) > \sum_{s=1}^{2} N_P^*(s) \tag{13}$$

Because of (5), Proposition 1 translates into Proposition 2.

Proposition 2 (Equilibrium Revenues) *Provider P earns lower revenues than provider C:*

$$R(s)N_C^*(s) > R(s)N_P^*(s) \Rightarrow \sum_{s=1}^{2} R(s)N_C^*(s) > \sum_{s=1}^{2} R(s)N_P^*(s) \tag{14}$$

Intuitively, because she cares for more patients' benefits, a Catholic decision maker sets a higher service intensity than a Protestant. This is appreciated by patients, which increases patient numbers of Catholic providers as compared to Protestant providers and, due to the payment scheme implemented, lets the Catholic provider make more revenues than the Protestant provider. Now define the average revenue of provider j as:

$$CMI_j \equiv \frac{R(1)N_j^*(s=1) + R(2)N_j^*(s=2)}{N_j^*(s=1) + N_j^*(s=2)}, \tag{15}$$

[16] Unsurprisingly, both C and P produce higher service levels than a profit maximizer. See Footnote 14.

where CMI denotes *casemix index*, a concept frequently used in health care studies and corresponding to average revenues of a provider.[17] Due to standardized reimbursement rates, $R(s)$, which distinguish among more and less complex treatments, higher CMI corresponds to higher average complexity of treatments. We prove the following proposition in the appendix.

Proposition 3 (Average Revenues) *The average revenue of provider P is larger than the average revenue of provider C:*

$$CMI_P > CMI_C \tag{16}$$

The Catholic provider generates higher total revenues but lower average revenues than the Protestant provider. This is because the Catholic provider puts relatively more resources into treating low severity patients, where marginal treatment benefits net of marginal treatment costs are higher than at the high severity level. This drives up patient numbers and revenues but reduces average severity of treatments and average revenues of the Catholic provider.

3.3 Model extensions: specialization and competition

Diversity and specialization in treatments: In the baseline model we assumed no fixed costs of operation and only considered vertical differentiation of providers, across severity levels.[18] Now let us assume that, within the unit mass of patients at each severity level $s \in \{1, 2\}$, every patient is characterized by a horizontally differentiated diagnosis type $t \in [0, 1]$, and that patients are uniformly distributed across diagnosis types. We study a two-stage game. At stage one, a provider determines the number $n \geq 1$ of her hospital's active treatment areas, which comes at cost $nF > 0$, for instance, for special diagnosis equipment or personnel with a specific

[17] See `http://en.wikipedia.org/wiki/Case_mix_index` for details on casemix index and `http://www.oshpd.ca.gov/HID/Products/PatDischargeData/CaseMixIndex/CMI/ExampleCalculation.pdf` for an application.

[18] In economics, horizontal diversification refers to a strategy of offering several variants of a product or service that cater to different consumer tastes (Hotelling, 1929). Vertical differentiation refers to a strategy of offering several variants of a product or service where, as long as prices are equal, all consumers prefer one variant over the other (colloquially referred to as "of higher quality"). See Shaked and Sutton (1982).

education. At stage two of the game, just as in the baseline model, the provider determines the service intensity $X(s)$ in each of the n active treatment areas.

On the diagnosis type interval over $[0, 1]$ at each severity level, we assume that hospitals distribute their n treatment areas such that the maximum distance to the diagnosis of a given patient is minimized. That is, if $n = 1$, the treatment area would be placed at $t = 0.5$, and the maximum distance to any patient's diagnosis would be 0.5. If $n = 2$, the treatment areas are at $t = 0.25$ and $t = 0.75$; the maximum "diagnosis distance" that a patient has to travel is 0.25. With n treatment areas, the maximum distance to any patient is $\frac{1}{2n}$.

Hence, in a hospital with few treatment areas the personnel and equipment is less specific to patient needs in expectation, which reduces the expected treatment utility of the patient.[19] We model this relation by multiplying the treatment benefit $B(X(s))$ with a factor $D = 1 - \frac{1}{2n} = \frac{2n-1}{2n}$: a hospital with high n offers diverse treatments and has a higher probability of being perfectly equipped for any possible treatment, whereas a hospital with low n specializes only in few treatment areas, saving some costs but offering only less customized treatments.

We solve this model for a subgame-perfect equilibrium by backward induction. At stage two of the game, the changes of the model have no impact on the objective function of a manager at the treatment area level: the objective function is still represented by equation (9). Consequently, this model variant has the same qualitative result as the baseline model: $X_C^* > X_P^*$ in every treatment area. At the hospital level, provider C still attracts more patients and earns higher total revenues than provider P but provider P generates higher average revenues.

At stage one, the provider can foresee the decisions she will make at stage two, $X_C^*(s)$ or $X_P^*(s)$, respectively. She uses this information when deciding n and maximizing the expected patient benefit net of the fixed costs of operating n treatment areas, the analogue of (9):

$$Max_n \quad EV_j \quad = \quad \frac{2n-1}{2n} \left[\sum_{s=1}^{2} \left[B(X_j^*(s)) - C(s, X_j^*(s)) \right] N^{\rho}(B(X_j^*(s))) \right] - nF \qquad (17)$$

[19] This reflects the importance of asset specificity underlined in transaction cost theory (Williamson, 1979).

We prove the following Proposition in the Appendix.

Proposition 4 (Diversity and specialization) *In expectation, Catholic hospitals serve more treatment areas than Protestant hospitals.*

This result captures an economies of scale-effect. Catholic hospitals attract more patients, who can benefit from more targeted services. More targeted services can be offered, on average, if a hospital has more treatment areas. Consequently, due to the larger benefit a Catholic provider gets from having more patients treated at her hospital, she also opts for more treatment areas—and thereby for more horizontal differentiation—than a Protestant provider.

Competition: Extending our baseline model, assume there is a second provider, at distance $1/\delta$ to the first. We interpret $\delta > 0$ as the degree of competitiveness the provider is exposed to. As before, demand for the provider's services increases in the patient benefits she offers. Because patients bear travel costs, we assume the sensitivity of the provider's demand to the service level offered decreases in the distance between the providers (it increases in competitiveness):[20]

$$N = N(\delta, B(X(s))); N_X > 0; N_{X\delta} > 0 \tag{18}$$

The provider's objective function is unchanged: (9). But because the sensitivity of demand grows in competitiveness, providers produce even higher service intensity if competition increases. We obtain the following proposition, which is proven in the appendix.

Proposition 5 (Competition) *(i) With increasing competitiveness, a provider's equilibrium service level $X_j^*(s)$ increases, which increases total revenues $R(s)N_j^*(s)$. The increase is higher at low severity levels than at high severity levels. (ii) The difference between equilibrium revenues of providers C and P increases with increasing competitiveness.*

[20] Ellis (1998) constructs a model of duopoly competition, where the providers' services are differentiated vertically (along severity levels) and horizontally (along a location dimension). There firm level demand is increasing in the market's competitiveness and in the benefits a provider supplies.

Proposition 5 states that the differences in strategic behavior between religious providers increase with increasing competitiveness.

3.4 Empirical hypotheses

Equilibrium values identified in the Propositions are unique, allowing us to construct empirical hypotheses. We expect to find the following correlations in our data:

H1: *Protestant hospitals treat less patients than Catholic hospitals (Proposition 1).*

H2: *Protestant hospitals have* ***(a)*** *lower total casemix* ***(b)*** *lower revenues than Catholic hospitals (Proposition 2).*

H3: *The* ***(a)*** *Casemix Index (CMI)* ***(b)*** *average revenue per patient is higher in Protestant than in Catholic hospitals (Proposition 3).*

H4: *Protestant hospitals have more links to universities and other academic institutions than Catholic providers.*

The higher complexity of services in Protestant hospitals (Proposition 3) has to be produced by appropriately educated personnel. Hence, we construct H5.[21]

H5: *Protestant hospitals employ more doctors per patient than Catholic hospitals.*

H6: *Catholic hospitals are active in more treatment areas/different medical fields than Protestant hospitals (Proposition 4).*

H7: *If competition increases, total revenues grow (Proposition 5.(i)).*

H8: *If competition increases, the lead in revenues of Catholic providers relative to Protestant providers grows even more (Proposition 5.(ii)).*

[21] Note that H5 implies higher treatment costs per patient in Protestant hospitals *independent of severity.* By contrast, Equation (12) shows that the equilibrium service intensity—and hence the associated cost per patient *at the same severity level*—is higher in Catholic than in Protestant facilities. As the predicted severity mix of patients is different across hospital types (combine Propositions 1 and 3), H5 and (12) are fully consistent.

4 Data and Empirical Results

4.1 The dataset

We use a newly constructed dataset covering all German hospitals. In particular, we merge data from the 2006 and 2008 reports published by the German Federal Office for Quality Assurance (*Bundesgeschäftsstelle für Qualitätssicherung* or *BQS*)[22] and from the 2007 and 2010 *Krankenhaus Reports* prepared by the Research Institute of AOK (*Wissenschaftliches Institut der AOK*), a major German health insurer.[23]

The BQS measures quality in hospitals but also publishes hospital-level data on ownership status, links to universities, and number of patients, doctors, specialists, nurses, and beds. It also reports the postal code of the hospital, the state and the municipality the hospital is located in and, for each hospital, the number of diagnoses in each ICD-10 category at the 4-digit level. The data are self-reported by the hospitals but are subject to a "structured dialogue" with experts discussing the reported data. One report is published for each hospital, in *xml*-format: 1939 reports for 2006 and 1922 reports for 2008. We extracted the relevant data using a computer program that exploited the standardized format of the reports to recover the variables of interest. To the best of our knowledge no other researchers have used these data before.[24]

While the BQS data provide information on whether the hospital is (private) nonprofit, (private) for-profit, or public, they do not explicitly distinguish between different types of nonprofit hospitals. We thus classified nonprofit hospitals into Protestant, Catholic, and other types of hospitals by looking ourselves at the hospital denomination and affiliation provided in each BQS report. All Catholic hospitals are a member of the *Caritas* organization (`www.caritas.de`), all Protestant hospitals are a member of *Diakonisches Werk* (`www.diakonie.de`). The *Krankenhaus-Reports* publish data collected by the German Federal Statistical Office (*Statis-*

[22] BQS data are officially known as *hospital quality reports* ("*Qualitätsberichte der Krankenhäuser gemäß § 137 Abs. 3 Nr. 4 SGB V*"). The complete set of reports, one for each hospital, is available at `www.g-ba.de`.

[23] See Klauber et al. (2007, 2010).

[24] Filistrucchi and Ozbugday (2012) use the data to measure the impact of quality disclosure on quality supply in German hospitals.

tisches Bundesamt) on casemix, casemix index and the base rate (*Basisfallwerte*).

We collected information on hospitals' foundation years (by browsing the internet), on the population's religious affiliation in the area around each hospital (from the German Census 2011),[25] and on the election results for the 2009 federal parliamentary elections to the *Bundestag* (obtained from the office of the *Bundeswahlleiter*, the public authority managing the elections).[26] Finally we added information on whether the local ruler chose Catholicism or Protestantism at the peace of Augsburg in 1555, in each administrative district (Spenkuch 2017).[27]

Table 1 shows that 40 percent of the nonprofit hospitals are Catholic, 23 percent are Protestant, and 37 percent belong to workers organizations, the Red Cross, or other denominations. We restrict attention to Catholic and Protestant hospitals because the other organizations are too heterogeneous to reasonably assume a common objective function of their managers.

Table 1: Percentage of nonprofit hospitals by type

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
catholic	0.395	0.489	0	1
protestant	0.233	0.423	0	1
other_nonprofit	0.372	0.484	0	1
N		1642		

Table 2 reports, for this subset of nonprofit hospitals, summary statistics on the variables we use in our empirical analysis. The unit of observation is a hospital. We have observations for two points in time: 2006 and 2008. In Tables 1 and 2 data for both years are pooled. The variables "protestant" and "catholic" are dummy variables that take value 1 if a hospital is affiliated with *Caritas* or *Diakonisches Werk*, respectively. The variable "casemix" is a measure of the severity of the cases treated by a hospital. For reimbursement reasons, each theoretical case is assigned a severity level (*„Bewertungsrelation"*), such that the (theoretical) average case gets a severity score of 1.0, a case with a lower score is less severe, and a case with a higher score is more severe. The casemix of a hospital is the sum of its severity scores. Hence, it depends on

[25]The data can be downloaded from `https://ergebnisse.zensus2011.de/?locale=en`.
[26]See `www.bundeswahlleiter.de`.
[27]This classification is also used in Spenkuch and Tillman (forthcoming).

both the severity and the number of cases. The Krankenhaus-Reports provide only the range of the casemix of a hospital (e.g. between 1,000 and 10,000). For each hospital we take as "casemix" the central value of the reported range. The average severity of cases treated in a hospital is measured instead by the Casemix Index (*"cmi"*). For each case, the reimbursement paid to a hospital is equal to the severity score times a base rate (*Basisfallwert)*.[28]

The variables "patients", "doctors", "specialists", "nurses" and "beds" report, respectively, the number of patients, doctors, specialists, nurses and beds in each hospital. Specialists and nurses are measured in full time equivalents (fte). The number of nurses is reported only for 2006. The variables "docperpat", "specperpat" and "nurseperpat" report the number of doctors, specialists and nurses per patient in each hospital.

The dummy variable "cl_winner" takes value 1 if the hospital is located in a constituency in which a center-left candidate (i.e. a candidate of *SPD* or *Die Linke*) was elected in the 2009 German federal parliamentary elections; it takes instead value 0 if the hospital is located in a constituency that elected a center-right candidate (i.e. a candidate from *CDU/CSU*).[29] The variable "cath_majority" is also a dummy, which takes value 1 if there are more Catholics than Protestants in the municipality where the hospital is located, and 0 otherwise.

The variable "prot_Augsburg" takes value 1 if the hospital is located in a district that became Protestant after the Peace of Augsburg in 1555, when the ruler of each territory in Germany could freely choose his religion but that the chosen religion would thereon apply to all people who lived in his territory (a famous principle known in Latin as "*cuius regio eius religio*"). It takes instead value 0 if the hospital is located in a district whose ruler chose Catholicism in 1555 or in a mixed district.[30] Similarly the variable "cath_Augsburg" takes value 1 if the hospital

[28]Since base rates are also included in the Krankenhaus-Reports, we also obtained a measure of the revenues of a hospital ("revenues") by multiplying the variable "casemix" with the base rate. The revenues per patient in each hospital ("revenuesperpat") were instead obtained multiplying "cmi" by the base rate. Given the high correlation, we report below only the results of the analysis for casemix and cmi, leaving those for revenues and revenues per patient to the Online Appendix.

[29]Note that in the 2009 federal elections no candidate from the green party *Die Grünen* was elected in the uninominal constituencies. The right-wing party *AfD* did not yet exist at the time.

[30]Territories of 1555 were matched to today's districts by Spenkuch (2017).

is located in a district that became Catholic after the Peace of Augsburg.

The variable "different_fields" reports the number of different medical fields the hospital is active in. The fields are defined as the class of diagnosis at the 1-digit level according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10 classification, German modification).[31] A hospital is considered active in a field if it had at least one diagnosis per week in that field in the given year.[32]

Finally, "academic" is a dummy variable that takes value 1 when the hospital is a teaching hospital linked to a university,[33] while "distance" measures the driving distance (in km) of a hospital to the closest neighboring hospital (irrespective of the ownership status of the latter).

Table 2: Summary Statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
protestant	0.371	0.483	0	1	1031
catholic	0.629	0.483	0	1	1031
academic	0.285	0.452	0	1	1031
patients	23628.386	19501.266	807	179397	915
cmi	0.901	0.311	0.001	2.006	850
casemix	9351.764	7870.03	500	35000	850
age	122.467	60.554	9	688	880
distance	6.833	7.399	0	37.31	1029
different_fields	11.546	6.235	0	21	977
beds	248.586	166.661	4	1121	1016
doctors	47.527	40.429	1	247	983
docperpat	25.695	15.945	2.532	185.376	887
specialists	25.536	22.041	1	148.7	984
specperpat	13.818	9.209	1.688	121.524	888
nurses	155.04	113.211	1.8	802.800	512
nurseperpat	103.649	83.524	25.222	834.503	459
cl_winner	0.362	0.481	0	1	1031
cath_majority	0.539	0.499	0	1	1031
prot_Augsburg	0.418	0.493	0	1	1031
cath_Augsburg	0.274	0.446	0	1	1031

[31] See `https://www.dimdi.de/static/en/klassi/icd-10-gm/`.

[32] Note that, thus defined, fields are quite large. For example, field VII includes all diseases of the eye. Our findings are robust to taking different thresholds to define when a hospital is active, as shown in the Online Appendix.

[33] More precisely, in the BQS quality reports, hospitals had to fill in question A-5: "Academic teaching hospital (yes/no)? If yes, linked to which university?" The dummy "academic" takes value 1 if the answer was "yes."

4.2 Empirical strategy

We test our empirical hypotheses, H1 to H8. All hypotheses stemming from the mathematical model, except H4, refer to differences between Protestant and Catholic hospitals in the means of the variables of interest. Hence, we run linear regressions of the variable of interest on a dummy variable that takes value 1 if the hospital has a Protestant affiliation and 0 if it has a Catholic one.[34] We control for the year of observation and additional factors, such as hospital size (measured by the number of "beds"), or whether the hospital is an "academic" teaching hospital. In addition, we include location fixed-effects to control for differences across hospitals that are in fact due to differences in the location of the hospital (such as, for instance, differences in the religious composition of the population across locations). This is important because many characteristics of the hospitals are endogenous in our model, while location is not. In fact, the decision to set up a hospital in a given location is a long-term decision that is predetermined with respect to the strategic choices we analyze.

We thus run a series of fixed-effects specifications of the form:

$$X_{it} = \alpha + \varphi_l + \lambda \text{PROTESTANT}_i + \gamma \text{YEAR2008}_t + Z'_{it}\mu + \varepsilon_{it}, \tag{19}$$

where where X_{it} is the variable of interest for hospital i in year t, $PROTESTANT_i$ is a dummy variable equal to 1 for Protestant (not Catholic) hospitals, $YEAR2008_t$ is a dummy variable equal to 1 if the observation refers to 2008, Z_{it} is a set of control variables, and ε_{it} is a normally distributed error term. α, λ and γ are parameters to be estimated. μ is a vector of parameters. φ_l are the location fixed effects.

Our main parameter of interest is λ. A positive and significant λ implies that the mean of the variable of interest is higher for Protestant than for Catholic nonprofit hospitals. Vice versa, a negative and significant λ implies that the mean of the variable of interest is lower for

[34] For the variables "patients" and "casemix", to prevent regression results from being influenced by outliers, we take the (natural) logarithm of the original variables.

Protestant than for Catholic nonprofit hospitals. We estimate λ from within-location differences. λ hence measures the average of the within-location differences in the variables of interest between the two types of religious hospitals.

Only to test H4 we use a non-linear (i.e.logit) specification: the dependent variable is the "academic" status of a hospital, which is dichotomous. Here too we include location fixed effects.

4.3 Estimation results

Estimation results show that, as predicted by the model, Protestant nonprofit hospitals are smaller and more specialized, treat fewer patients but more complex cases and are more often academic teaching hospitals than Catholic ones.

The first two columns of Table 3 report results of fixed effects regressions of the number of patients on a hospital's religious affiliation. They thus provide a test of H1. Both columns control for the year of observation. Notably, the difference in the mean number of patients could be driven by differences among locations rather than among hospitals. Indeed, some places are mainly Protestant, others are mainly Catholic. To prevent the Protestant variable from picking up differences between Catholic and Protestant locations rather than between Catholic and Protestant nonprofit hospitals, we include municipality fixed effects.[35]

Results show that, even if we compare Protestant and Catholic hospitals within the same municipality, the number of patients in Protestant hospitals is on average significantly smaller than in Catholic hospitals.[36] We also control for hospitals' academic status and, in column two, for hospital size, which is measured in terms of capacity, by the number of beds.[37] Unsurprisingly, larger hospitals treat more patients. Also academic hospitals treat more patients.

[35]We discuss this issue further in Section 4.4

[36]The Online Appendix (Table 2) shows that results are robust to the use of different location fixed effects: not only "state" or "district" but also the postal "area", the postal "region," or the electoral "constituency".

[37]To the extent that the capacity of a hospital is periodically adjusted to match patient numbers, the number of beds could be considered an endogenous variable. For this reason, in column one we do not control for the number of beds.

Table 3: Testing H1, H2, and H3: Regression of patients, casemix, and CMI on religion

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	lpatients	lpatients	lcasemix	lcasemix	cmi	cmi
protestant	-0.183***	-0.133***	-0.222***	-0.181***	0.0786***	0.0780***
	(0.0694)	(0.0419)	(0.0578)	(0.0442)	(0.0286)	(0.0292)
academic	0.861***	0.0945*	0.849***	0.298***	0.0407	0.0181
	(0.0783)	(0.0530)	(0.0670)	(0.0580)	(0.0332)	(0.0384)
lbeds		1.279***		0.904***		0.0279
		(0.0398)		(0.0457)		(0.0302)
yd2008	0.0815*	0.0979***	0.0585*	0.0774***	0.124***	0.127***
	(0.0424)	(0.0256)	(0.0355)	(0.0271)	(0.0176)	(0.0179)
Constant	9.464***	2.778***	8.602***	3.875***	0.802***	0.657***
	(0.0441)	(0.210)	(0.0369)	(0.241)	(0.0183)	(0.159)
Observations	915	915	850	839	850	839
R-squared	0.177	0.701	0.240	0.565	0.097	0.100
Num munic_code	320	320	302	302	302	302

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Column three and four in Table 3 show results of regressions of the casemix of a hospital on its religious affiliation, thus testing H2a. Again we control for the year of observation, the academic status of a hospital and, in column four, also for the size of the hospital.[38] Here too we include municipality fixed effects.

Results show that on average Protestant nonprofit hospitals have significantly lower casemix than Catholic ones, as predicted by the model.[39] They also show that both academic hospitals and larger hospitals have a higher casemix on average. In the Online Appendix (Table 5), we report that the difference in casemix between Protestant and Catholic hospitals translates into different total revenues: on average Protestant hospitals make significantly lower revenues than Catholic ones, as postulated in H2b.

Although Catholic hospitals have a higher casemix, results from the last two columns of Table 3 report that the casemix index (CMI) is on average significantly higher for Protestant hospitals: on average Protestant hospitals treat more severe cases, thus confirming H3a.[40] We

[38] We do not include the number of patients as a measure of a hospital's size, because patients are an endogenous variable in our model (and the dependent variable in the first set of regressions reported in Table 3).

[39] This results are robust to the use of different location fixed effects. See Table 3 of the Online Appendix.

[40] Again these results are robust to the use of different location fixed effects. See Table 4 in the Online Appendix.

also control for the academic status and size of the hospital but these are not significant. Table 6 in the Online Appendix shows that the significant difference in CMI translates into a significant difference in the average revenues per patient. Therefore, H3b is also confirmed.

Turning to the role of education, results in Table 4 show that significantly more Protestant than Catholic hospitals are academic teaching hospitals. This finding confirms H4. Given the dichotomous dependent variable, we use a logit specification here.[41]

Table 4: Testing H4: Regression of academic status on religion

	(1)	(2)
VARIABLES	academic	academic
protestant	0.406*	0.539*
	(0.243)	(0.285)
lbeds		2.506***
		(0.341)
yd2008	0.0177	0.0853
	(0.218)	(0.271)
Observations	360	353
Num munic_code	44	44

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 shows that the number of doctors per patient (in columns three and four) and, even more, the number of specialists per patient (in columns five and six) is significantly higher in Protestant than in Catholic hospitals. Instead, there is no significant difference in the number of nurses per patient. Hypothesis H5 is also confirmed.

Analyzing hospital diversification, Table 6 shows that, as postulated by H6, Catholic hospitals are active in significantly more medical fields.[42] However, as shown in the second and third column, this finding is due to the larger size and the higher number of patients in Catholic hospitals with respect to Protestant ones, as predicted by the model.

[41] Using a logit specification with fixed effects causes the estimation to drop a significant number of observations. Results are however confirmed if we use a linear specification, as shown in Table 7 in the Online Appendix.

[42] This finding is robust to different definitions of "active" hospitals; see the Online Appendix.

Table 5: Testing H5: Regression of nurses, doctors, specialists per 10,000 patients on religion

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	nurseperpat	nurseperpat	docperpat	docperpat	specperpat	specperpat
protestant	5.989	6.091	2.446*	2.328*	1.930***	1.881***
	(11.99)	(11.49)	(1.247)	(1.237)	(0.659)	(0.655)
academic	-37.16***	-13.10	-4.205***	-2.214	-1.476*	-0.575
	(13.69)	(14.56)	(1.463)	(1.575)	(0.768)	(0.826)
lbeds		-43.13***		-4.074***		-1.894***
		(11.37)		(1.257)		(0.663)
yd2008			-1.869**	-1.908**	-1.305***	-1.318***
			(0.760)	(0.754)	(0.402)	(0.400)
Constant	113.0***	338.7***	27.07***	48.63***	14.24***	24.27***
	(6.726)	(59.87)	(0.799)	(6.697)	(0.423)	(3.535)
Observations	459	459	887	887	888	888
R-squared	0.048	0.133	0.029	0.047	0.036	0.050
Num munic_code	309	309	313	313	314	314

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Testing H6: Regression of different fields on religion

	(1)	(2)	(3)
VARIABLES	different_fields	different_fields	different_fields
protestant	-1.013**	-0.344	0.235
	(0.441)	(0.368)	(0.368)
academic	4.067***	0.252	0.00114
	(0.502)	(0.466)	(0.460)
yd2008	1.214***	1.208***	0.891***
	(0.269)	(0.223)	(0.229)
lbeds		5.374***	
		(0.308)	
lpatients			4.132***
			(0.234)
Constant	10.10***	-17.56***	-28.65***
	(0.281)	(1.604)	(2.234)
Observations	977	966	877
R-squared	0.122	0.409	0.427
Num munic_code	340	340	313

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Does competitive pressure influence nonprofit hospitals' strategies? As a measure of competitive pressure we use the geographical distance to the closest neighboring hospital, irrespective of whether the latter is nonprofit, public or for-profit. We assume the smaller the geographic

distance to the nearest hospital, the higher the competitive pressure a hospital is exposed to.[43]

Table 7 shows that, as distance to the closest hospital declines (as competitive pressure grows), the casemix of a hospital rises. This effect is captured by the negative coefficient of the variable "distance." In addition, as distance to the closest hospital declines, the difference in the casemix of Catholic and Protestant hospitals increases. This effect is captured by the positive coefficient of the variable "protestantd", which is the interaction term between the variables "distance" and "protestant", as compared to the negative coefficient of the variable "distance": higher competitive pressure leads to a higher casemix in all hospitals, on average, but to a lower casemix in Protestant hospitals. This increases the lead of Catholic hospitals in casemix. H7 and H8 are thus confirmed.

Table 7: Testing H7 and H8: Regression of casemix on religion and competitive pressure

	(1)	(2)
VARIABLES	lcasemix	lcasemix
protestant	-0.406***	-0.253***
	(0.0812)	(0.0629)
protestantd	0.0757***	0.0309*
	(0.0229)	(0.0177)
distance	-0.0497***	-0.0321**
	(0.0178)	(0.0137)
academic	0.851***	0.300***
	(0.0666)	(0.0581)
lbeds		0.895***
		(0.0459)
yd2008	0.0601*	0.0786***
	(0.0351)	(0.0270)
Constant	8.855***	4.110***
	(0.116)	(0.260)
Observations	850	839
R-squared	0.256	0.570
Num munic_code	302	302

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Finally, the impact of religious affiliation on hospitals' strategies does not seem to pass through the education channel. As shown in Table 4, more Protestant than Catholic hospitals are academic teaching hospitals. However, controlling for the academic status of a hospital,

[43]This assumption is consistent with the impact of travel costs in our mathematical model; see equation (18).

differences between Catholic and Protestant hospitals remain significant, while the academic status itself is sometimes not significant. Hence, Catholic hospitals treat more patients, even taking into account the academic status of a hospital (columns one and two in Table 3), whereas academic hospitals do not treat more severe cases on average, but Protestant hospitals do (columns five and six in Table 3).

4.4 Robustness checks

We now investigate four alternative explanations for the observed differences between Catholic and Protestant nonprofit hospitals: I) Catholic hospitals have more patients because Catholic people prefer Catholic hospitals and there are more Catholic people; II) Catholic hospitals have more patients and treat less severe cases because Catholic people prefer a Catholic hospital and Catholic people have a weaker attitude toward illness (i.e. they tend to access hospitals also for less severe illnesses), III) Catholic hospitals are larger and more diversified because they were founded first as generalist hospitals while Protestant hospitals were founded later, filling niches; IV) there are on average fewer and more severe patients in Protestant hospitals because there are more Protestant hospitals in municipalities that are more conservative and that hence favor lower public spending on health care, thus treating fewer people and more complex cases only.

4.4.1 Alternative explanation I: religious composition of the population in regions

Could Catholic hospitals have more patients because Catholic people prefer Catholic hospitals and there are more Catholic people in Germany? In fact, according the 2011 Census, 30.8% of the population of Germany is Catholic, while Protestants account for 30.3%. Other sources provide a similar picture: the Catholic and Protestant populations are roughly equal in size. Still there is a huge variation between different parts of Germany (whether at *Länder* (states), *Kreise* (districts) or *Gemeinde* (municipalties) level).

By using municipality fixed effects we already estimated the parameters of interest from

within-municipality variation such that differences across municipalities in the dependent and explanatory variables are not used for the estimation. However, in Table 3, the within-municipality variation is averaged across municipalities that have a Protestant majority and municipalities that have a Catholic majority.

As a robustness check, in columns one and two of Table 8 we allow for a differential effect of a hospital's denomination on the number of patients depending on whether the hospital is located in a municipality which has a Catholic or a Protestant majority. The interaction term between the hospital being Protestant and its municipality having a Catholic majority (*"protestant_cath_maj"*) is however not significant. Hence, irrespective of the faith of the majority of the population, Catholic nonprofit hospitals are found to treat significantly more people than Protestant ones. Consequently we can discard the first alternative explanation.

Table 8: Robustness checks: Testing for differential effects of religion depending on majority religion and religion at Augsburg's peace

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	lpatients	lpatients	lpatients	lpatients	cmi	cmi
protestant	-0.259***	-0.114**	-0.144	-0.172***	0.0933**	0.0880**
	(-2.704)	(-1.972)	(-1.390)	(-2.752)	(2.166)	(1.968)
protestant_cath_maj	0.159	-0.0391				
	(1.144)	(-0.466)				
protestant_Augs_mix			-0.0491	0.0497	-0.0240	-0.0162
			(-0.319)	(0.534)	(-0.378)	(-0.250)
protestant_Augs_cath			-0.114	0.115	-0.0310	-0.0203
			(-0.590)	(0.985)	(-0.386)	(-0.247)
academic	0.866***	0.0925*	0.859***	0.0947*	0.0405	0.0185
	(11.04)	(1.740)	(10.91)	(1.783)	(1.207)	(0.478)
lbeds		1.280***		1.281***		0.0273
		(32.08)		(32.13)		(0.896)
yd2008	0.0818*	0.0978***	0.0816*	0.0978***	0.124***	0.127***
	(1.930)	(3.821)	(1.923)	(3.819)	(7.028)	(7.102)
Constant	9.475***	2.769***	9.461***	2.769***	0.800***	0.660***
	(209.7)	(13.13)	(209.8)	(13.18)	(42.92)	(4.122)
Observations	915	915	915	915	850	839
R-squared	0.179	0.701	0.177	0.701	0.098	0.100
Num munic_code	320	320	320	320	302	302

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.4.2 Alternative explanation II: different attitude towards illness

Do Catholic hospitals have more patients and treat less severe cases on average because Catholic people prefer a Catholic hospital and Catholic people have a weaker attitude towards illness (i.e. they visit hospitals more often, also when they are less severely sick)? We could not find any relevant individual-level evidence. However, a necessary condition for this alternative explanation is that Catholic people prefer Catholic hospitals. We have shown in Table 3 that Catholic hospitals treat significantly more people than Protestant ones irrespective of the main faith in the hospital's municipality. Hence, this second alternative explanation can be discarded.

4.4.3 Alternative explanation III: foundation sequence of hospitals

Are Catholic hospitals larger and more diversified because they were founded first, as generalist hospitals, whereas Protestant hospitals were founded later in niches? In fact, according to the hospitals' foundation years we collected by browsing the Internet, Protestant hospitals are on average 16 years younger than Catholic ones.[44] Hence, as a first check, we control for hospital age: in Table 9, the findings of Table 3 are confirmed, though.

[44]The average age is 112.95 years for Protestant versus 128.20 years for Catholic hospitals. The difference is significant at 1 percent.

Table 9: Testing H1, H2, and H3: Regression of patients, casemix, and cmi on religion controlling for age

VARIABLES	(1) lpatients	(2) lpatients	(3) lcasemix	(4) lcasemix	(5) cmi	(6) cmi
protestant	-0.234***	-0.167***	-0.264***	-0.222***	0.0624*	0.0591*
	(0.0737)	(0.0440)	(0.0596)	(0.0459)	(0.0328)	(0.0337)
academic	0.888***	0.0503	0.913***	0.358***	0.0298	0.0129
	(0.0846)	(0.0577)	(0.0688)	(0.0610)	(0.0379)	(0.0447)
lbeds		1.256***		0.866***		0.0130
		(0.0418)		(0.0481)		(0.0352)
yd2008	0.0871**	0.0991***	0.0579*	0.0708***	0.125***	0.129***
	(0.0425)	(0.0254)	(0.0344)	(0.0264)	(0.0190)	(0.0193)
age	0.00380***	0.000238	0.00285***	0.00214***	-0.00107*	-0.00112**
	(0.00116)	(0.000700)	(0.00101)	(0.000769)	(0.000556)	(0.000564)
Constant	9.036***	2.924***	8.258***	3.814***	0.940***	0.883***
	(0.149)	(0.222)	(0.131)	(0.267)	(0.0724)	(0.196)
Observations	787	787	728	718	728	718
R-squared	0.207	0.719	0.302	0.599	0.100	0.103
Num munic_code	285	285	268	268	268	268

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Foundation years of hospitals collected on the internet may be imprecise. Therefore, as an additional robustness check, we exploit the historical fact that, at the *Peace of Augsburg* in 1555, the ruler of each territory in Germany could freely choose his religion but that the chosen religion would thereon apply to all people living in his territory (a famous principle known in Latin as *"cuius regio eius religio"*). Given this division of the country between Catholics and Protestants, we expect that, as a general rule, Protestant hospitals moved first in municipalities that became Protestant and Catholic hospitals moved first in municipalities whose ruler chose Catholicism after the peace of Augsburg. In columns three to six of Table 8, we keep as a benchmark hospitals located in municipalities belonging to districts that were Protestant and allow for differential effects for those in Catholic or mixed districts at the peace of Augsburg.[45] These interaction terms (*"protestant_Augs_mix"* and *"protestant_Augs_cath"*) are however insignificant, thus showing that Catholic hospitals treat significantly more people and less severe cases than

[45]Since today's districts do not necessarily correspond exactly to the 1555 territories, some of today's districts were at the time partly Catholic and partly Protestant. Following Spenkuch (2017) we define them as "mixed."

Protestant hospitals irrespective of the historical religious roots established in 1555. Hence, the results in Table 8 contradict this alternative explanation.

4.4.4 Alternative explanation IV: political preferences

Can political preferences substitute religiosity as an explanation for the observed strategic differences between Catholic and Protestant hospitals? We first check whether there are on average fewer patients in Protestant hospitals because there are more Protestant hospitals in conservative municipalities. Conservative municipalities may favor lower public spending on health care, which would lead to smaller hospitals treating fewer patients and more complex cases only. In this case, the lower number of patients in Protestant hospitals could be due to political preferences of the population rather than to the beliefs of Protestant hospitals' managers.

By using municipality fixed effects we already estimated the parameters of interest from within-municipality variations. However, in Table 3 the within-municipality effects of religiosity on the number of patients and cmi are averaged across municipalities whose populations have different political preferences. We first split the sample into hospitals located in municipalities belonging to constituencies where a center-left or a center-right candidate won at the federal parliamentary elections in 2009. The average number of patients is indeed lower in hospitals located in constituencies where a center-right, not a center-left candidate won (22,480 versus 25,957). However, we find that, contrary to the hypothesis made above, there is a higher proportion of Protestant nonprofit hospitals in constituencies that elected a center-left candidate compared to those that elected a center-right candidate (43 percent versus 33 percent). Then, in Table 10, we keep as a benchmark hospitals located in constituencies were a center-right candidate won and allow for a differential effect of the religious denomination of a hospital depending on whether the hospital is located in a constituency where a center-left or a center-right candidate won. In columns three and four this interaction term for Protestant hospitals in center-left constituencies (*"protestant_cl_winner"*) is not significant when the dependent variable

is *"cmi"*, thus showing that Catholic hospitals treat significantly less severe cases than Protestant hospitals irrespective of the political preferences of the population. It is instead significant when the dependent variable is *"patients"* and one does not control for size. In this context, however, it is particularly important to control for hospital size because, if center-right political preferences favor lower expenses on health care, they may also favor smaller hospitals. Indeed, we find that on average hospitals in center-right constituencies have significantly fewer beds than hospitals in center-left constituencies (278 versus 231).[46]

Table 10: Robustness Checks: Testing for differential effects of religion depending on winner at political elections

	(1)	(2)	(3)	(4)
VARIABLES	lpatients	lpatients	cmi	cmi
protestant	-0.367***	-0.171***	0.103**	0.105**
	(-3.526)	(-2.696)	(2.340)	(2.272)
protestant_cl_winner	0.329**	0.0677	-0.0423	-0.0456
	(2.361)	(0.798)	(-0.729)	(-0.758)
academic	0.847***	0.0935*	0.0422	0.0180
	(10.83)	(1.764)	(1.268)	(0.468)
lbeds		1.276***		0.0312
		(31.92)		(1.022)
yd2008	0.0811*	0.0978***	0.124***	0.127***
	(1.920)	(3.819)	(7.033)	(7.112)
Constant	9.480***	2.798***	0.800***	0.638***
	(213.2)	(13.25)	(43.43)	(3.953)
Observations	915	915	850	839
R-squared	0.184	0.701	0.098	0.101
Number of municipality_code	320	320	302	302

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We conclude that, although political preferences may play some role for the number of patients treated by nonprofit hospitals as a whole, their role could be a complementary one, at most, when explaining patient number differences between Catholic and Protestant hospitals.

[46] We also find that, when we control for competitive pressure, the preference of Protestant decision makers in conservative municipalities for lower number of patients is more pronounced. However, once again, this effect is mainly driven by a preference for size as measured by the number of beds: controlling for size, the difference in patients between Catholic and Protestant hospitals is not significantly different between center-left and center-right constituencies, consistently with the finding in Table 10.

At most, when political preferences are more likely to favor lower expenses on health care and thus treating fewer patients, the preference of Protestant decision makers for a lower number of patients can manifest itself more easily.

Alternately, the observed strategic differences could be due to a more conservative political attitude of Protestant decision makers rather than to their religious beliefs *per se*.[47] Then these decision makers would prefer having smaller hospitals and treating fewer patients and more complex cases because they are conservative, not because they are Protestant.

We do not have information on the political preferences of hospital decision makers. However, evidence suggests that the link between religiosity and political preferences in Germany, if anything, goes in the opposite direction. According to the German Longitudinal Election Survey,[48] in the 2009 elections German voters who declared themselves Protestant were equally likely to vote center-right or center-left,[49] while those who declared themselves Catholic were more likely to vote center-right.[50] Consistently, in our dataset, i.e. for municipalities in which there exists at least one nonprofit hospital, the correlation between the municipality having a Protestant majority and belonging to a constituency that elected a center-right candidate is -0.22. We conclude that the empirical evidence does not support this alternative explanation.

All in all, it appears that alternative explanations based on political preferences at most complement, rather than substitute, our main explanation.

5 Discussion and Conclusion

This study of the complete set of German nonprofit hospitals supports our predictions about the measurable effects of faith for the corporate strategy of religiously affiliated nonprofit organizations. Decision makers hired to run a nonprofit are selected based on denomination and are

[47] Note that this alternative explanation would not rule out that ultimate causality lies in the religious beliefs if the latter play a role in determining political preferences.

[48] See http://gles.eu/wordpress/.

[49] The percentages were 24.35 for *CDU/CSU* and 23.46 for *SPD or Die Linke*, respectively.

[50] 29.49 percent for *CDU/CSU* and only 17.75 percent for *SPD or Die Linke*.

influenced by their religious values when deciding about their organizations' actions. Via this channel—and not via direct interference of church superiors—the religious and moral values of denominations that were developed hundreds of years ago are represented in strategic choices that can be observed and predicted in today's markets. These findings are particularly surprising because Europe has experienced a long period of secularization, at least since the 1950s, and the impact of religious values is mostly ignored publicly.[51] Underlining the exceptional, despite an increase in the importance of religiosity in much of the world (Berger, 2001), this development occurs "with the notable exception of Western Europe" (Tracey, 2012:88).

This paper makes three key contributions. First, we confirm that the values and beliefs of organizational decision makers, as required by their employers, influence the strategic actions of firms. We extend this perspective to the study of nonprofit organizations. Nonprofits appear to be a very fruitful avenue for such research because decision makers in nonprofits have more discretion in making strategic choices and face performance metrics that are less easy to monitor, given the absence of straightforward goals such as shareholder value maximization.

Second, this paper is among the first to investigate the strategic effects of decision makers' religious values. Because a religious, long-lasting parent organization (*Caritas/Diakonisches Werk*) and an employed nonprofit decision maker with the same religious values interact in our sample, suggests that the effects of religious values for strategy are particulary persistent.

Third, we have tackled the difficulties of the empirical and theoretical literatures on nonprofits to predict their strategic choices by fleshing out lines of distinction between different nonprofit types that are distinguishable according to observable organizational characteristics. Based on a literature study of the economic effects of Protestantism and Catholicism, we could identify key inputs into a mathematical model of a health care market, distinguishing between providers of each faith. Testing the model's predictions with a novel, unique dataset covering all German hospitals for the years 2006 and 2008, we found the predicted empirical patterns of

[51]The theoretical underpinning of this trend is the *secularization hypothesis*, according to which economic development causes individuals to become less religious. See the discussion in Barro and McCleary (2003).

the strategic behavior of Catholic and Protestant nonprofit hospitals confirmed.

Catholic nonprofit hospitals follow a strategy of horizontal diversification and maximization of the number of patients treated. By contrast, Protestant hospitals specialize in fewer treatment areas horizontally and focus more on vertical differentiation by producing more complex services on average, which they generate with more specialized labor (doctors and specialized doctors per patient). They also have more links to universities and other institutions of higher education—a result that is fully in line with the literature's notion that Protestant believers value education and complex technologies, as signs of worldly success, more than Catholic believers. In more competitive environments, these differences are even more pronounced, which suggests that the religious profile of a nonprofit provider is an important driver of product differentiation to overcome competitive pressures. This result is in the spirit of Finke and Stark (1998) who show a positive correlation between religious participation in US cities and competition of faiths.

To provide additional support to our claim that the observed differences in strategic behavior between Catholic and Protestant hospitals is the result of differences in religious beliefs, we considered four alternative explanations that might a priori be thought of as driving our empirical findings. In particular, we consider the religious composition of the population, the foundation sequence of hospitals, the political preferences of the population, and the attitude towards health problems. Although political preferences of Protestant citizens may play a role in allowing Protestant hospitals to satisfy their propensity towards education, as compared to Catholic citizens, none of these alternative explanations is fully supported by the data and, even taken together, all of these alternative explanations cannot explain the empirical findings better than the difference in religious beliefs of hospital decision makers.

A limitation of this study is that we cannot connect the observed hospital strategies with reliable performance outcomes. Despite the fact that the BQS data we use contain some hospital quality measures, differences between Catholic and Protestant hospitals do not appear to be significant. However, there is a major issue in interpreting this result: the quality measures

relate to specific medical conditions. Since Protestant hospitals specialize in more complex treatments, it is hard to find a measure that is indicative of the difference in quality between religious hospitals in general. In addition, the quality measures are not risk adjusted. Protestant hospitals treat more severe cases (Table 3). Hence, even if they were of higher quality, their quality indicators may be downward biased, such that the difference in quality between Catholic and Protestant hospitals may be biased towards zero.

Our results imply for future studies of nonprofit organizations that they should distinguish between different nonprofit types, depending on observable organizational characteristics. Moreover, obtaining data on the values and beliefs (religious and non-religious) of individual decision makers in nonprofit (and for-profit and public) organizations and to study the links of these data with strategic actions of those organizations could offer interesting insights.[52]

Regarding the question what goals nonprofits pursue, our answer is: it depends on the nonprofit's organizational affiliation, which shapes its decision makers' values (or attracts those with certain values). As values depend on culture and religion is a key determinant of culture (Barro and McCleary, 2003), the faith of decision makers and those who employ them affects the strategic actions of their firms. The case of religiously affiliated nonprofits is particularly strong because churches influence both selection and conduct of such nonprofit's employees. Hence, the importance of values may be stronger in religious than in secular organizations. But our results make it conceivable that future research finds related effects of decision makers' religious beliefs in other organizational structures, including publicly-traded firms, as well.

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[52] See Kirchmaier et al. (2017), for an example of individual-level data on a set of religious and ethical beliefs of a representative sample of the Dutch population.

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References

Agle BR, Mitchell RK, Sonnenfeld JA (1999) Who matters to CEOs? An investigation of stakeholder attributes and salience, corporate performance, and CEO values. *Acad Manag. J.* 42:507–525.

Andrews KR (1980) *The Concept of Corporate Strategy* (2nd ed) (Homewood, Illinois, Irvin).

Arrunada B (2009) Protestants and Catholics: Similar Work Ethic, Different Social Ethic. *Economic J.* 120:890-918.

Barro RJ, McCleary RM (2003) Religion and Economic Growth across Countries. *Amer.Soc.Rev.* 68:760-781.

Barro RJ, McCleary RM (2005) Which Countries have State Religions? *Quart. J. Econom.* 120:1331-1370.

Baumann M (2007) Researching Religious Diversity in Western Europe: The Study of Diaspora Communities, Religious Conflict, and Public Domain in Germany and Switzerland. Nathan KS ed. *Religious Pluralism in Democratic Societies: Challenges and Prospects for Southeast Asia, Europe and the United States in the New Millennium* (K Adenauer Stiftung, Singapore):139-157.

Becker SO, Woessmann L (2009) Was Weber Wrong? A Human Capital Theory of Protestant Economic History. *Quart. J. Econom.* 124:531-596.

Berger PL (2001) Reflections on the Sociology of Religion Today. *Soc. Relig.* 62:425-429.

Besley T, Ghatak M (2005) Competition and Incentives with Motivated Agents. *Amer. Econom. Rev.* 95:616-636.

Boone C, Brouwer A, Jacobs J, van Witteloostuijn A, de Zwaan M (2012) Religious Pluralism and Organizational Diversity: An Empirical Test in the City of Zwolle, the Netherlands, 1851-1914." *Sociol. Relig.* 73:150-173.

Busse R, Riesberg A (2004) *Health care systems in transition: Germany.* WHO Regional Office for Europe, on behalf of the European Observatory on Health Systems and Policies.

Caritas (2011) *Grundordnung des kirchlichen Dienstes im Rahmen kirchlicher Arbeitsverhältnisse*. Deutscher Caritasverband, 20 June 2011. `http://www.caritas.de/glossare/grundordnung-des-kirchlichen-dienstes`.

Chan-Serafin S, Brief AP, George JM (2013) How Does Religion Matter and Why? Religion and the Organizational Sciences *Org. Sci.* 24:1585-1600.

Chin MK, Hambrick DC, Treviño LK (2013) Political Ideologies of CEOs: The Influence of Executives' Values on Corporate Social Responsibility. *Admin. Sci. Quart.* 58:197-232.

Delfgaauw J, Dur R, Propper C, Smith S. (2011) Management Practices: Are Not For Profits Different? *Tinbergen Inst. Disc. Paper* TI 2011-094/1.

Demerath NJ III, Schmitt T (1998) Transcending sacred and secular: Mutual benefits in analyzing religious and nonreligious organizations. Demerath NJ III, Hall PD, Schmitt T, Williams RH eds. *Sacred companies: Organizational aspects of religion and religious aspects of organizations* (Oxf. U. Press, NY).

Diakonie (2014) *Arbeitsrecht in Kirche und Diakonie*. Accessed 29 September 2014 at `http://www.diakonie.de/arbeitsrecht-in-e-und-diakonie-9452.html`.

Dur R, Zoutenbier R (2011) Working for a Good Cause. *Tinbergen Inst. Disc.Paper* TI 2011-168/1.

Eggleston K, Shen YC, Lau J, Schmid CH, Chan J (2008) Hospital Ownership and Quality of Care: What Explains the Different Results in the Literature? *Health Econom.* 17:1345-62.

Ellis RP (1998) Creaming, skimping and dumping: provider competition on the intensive and extensive margins. *J. Health Econom.* 17:537-555.

Filistrucchi L, Ozbugday FC (2012) Mandatory Quality Disclosure and Quality Supply: Evidence from German Hospitals. *TILEC Disc. Paper* 2012-031, Tilburg University.

Finke R, Stark R (1988) Religious economies and sacred canopies: Religious mobilization in American cities, 1906. *Amer. Sociol. Rev.* 53:41-49.

Finkelstein S, Hambrick DC, Cannella A. (2009) *Strategic leadership: Theory and Research on Executives, Top Management Teams, and Boards* (Oxf. U Press, NY).

Francois P (2003) Not-For-Profit Provision of Public Services. *Econom. J.* 113:C53-C61.

Francois P (2007) Making a difference. *RAND J. Econom.* 38:714-732.

Francois P, Vlassopolous M (2008) Prosocial Motivation and Delivery of Social Services. *CESifo Econom. Stud.* 54:22-54.

Gertler P, Kuan J (2009) Does It Matter Who Your Buyer Is? The Role of Nonprofit Mission in the Market for Corporate Control of Hospitals. *J. Law Econom.* 52:295-306.

Glaeser EL (2003) Introduction. Glaeser EL ed. *The Governance of Not-for-Profit Organizations* (U Chicago Press, London).

Glaeser EL, Glendon S (1998) Incentives, Predestination and Free Will. *Econom. Inqu.* 36:429-443.

Glaeser EL, Sacerdote BI (2008) Education and Religion. *J. Human Cap.* 2:188-215.

Hambrick DC, Mason PA (1984) Upper Echelons: The Organization as a Reflection of Its Top Managers. *Acad. Manag. Rev.* 9:193-206.

Hansmann H (1980) The Role of Nonprofit Enterprise. *Yale Law J.* 89:835-901.

Hansmann H (1996) *The Ownership of Enterprise* (Belknap Press, Cambridge, MA).

Hansmann H, Kessler D, McClellan M (2003) Ownership Form and Trapped Capital in the Hospital Industry. Glaeser EL ed. *The Governance of Not-for-Profit Organizations* (U Chicago Press, London).

Hatten ML (1982) Strategic Management in Not-For-Profit Organizations. *Strat. Manag. J.* 3:89-104.

Herbst P, Prüfer J (2016) Firms, Nonprofits, and Cooperatives: A Theory of Organizational Choice. *Annals Pub. Coop. Econom.* 87:315-343.

van Hoorn A, Maseland R (2013) Does a Protestant work ethic exist? Evidence from the well-being effect of unemployment. *J. Econom. Behav. Org.* 91:1-12.

Horwitz J (2007) Does Nonprofit Ownership Matter? *Yale J. Regulation* 24:139-204.

Horwitz J, Nichols A (2007) What Do Nonprofits Maximize? Nonprofit Hospital Service Provision And Market Ownership Mix." *NBER Working Paper* 13246.

Hosmer LT (1994) Strategic Planning as if Ethics Mattered. *Strat. Manag. J.* 15:17-34.

Hotelling H (1929) Stability in Competition. *Econom. J.* 39:41-57.

Jensen MC, Ruback RS (1983) The Market for Corporate Control. *J. Fin. Econom.* 11:5-50.

King MD, Haveman HA (2008) Antislavery in America: The Press, the Pulpit, and the Rise of Antislavery Societies. *Adm. Sci. Quart.* 53:492–528.

Kirchmaier I, Prüfer J, Trautmann S (2017) Religion, Moral Attitudes, and Economic Behavior. mimeo.

Klauber J, Robra BP, Schellschmidt H (2007) *Krankenhaus-Report 2008* (Schattauer, Stuttgart).

Klauber J, Geraedts M, Friedrich J (2010) *Krankenhaus-Report 2010* (Schattauer, Stuttgart).

Lam PY (2006) Religion and Civic Culture: A Cross-National Study of Voluntary Association Membership. *J. Sci. Study Religion* 45:177-193.

Larrain M, Prüfer J (2015) Trade Associations, Lobbying, and Endogenous Institutions. *J. Legal Analysis* 7:467-516.

Malani A, Philipson T, David G (2003) Theories of Firm Behavior in the Nonprofit Sector: A Synthesis and Empirical Evaluation. Glaeser EL ed. *The Governance of Not-for-Profit Organizations* (U Chicago Press, London).

Marquis C, Lee M (2013) Who is Governing Whom? Executives, Governance, and the Structure of Generosity in Large U.S. Firms. *Strat. Manag. J.* 34:483-497.

Miller KD (2002) Competitive Strategies of Religious Organizations. *Strat. Manag. J.* 23:435-456.

Noussair CN, Trautmann S, v.d. Kuilen G, Vellekoop N (2013) Risk Aversion and Religion *J. Risk Uncertainty* 47:165-183.

Odom RY, Boxx WR (1988) Environment, Planning Processes, and Organizational Performance of Churches. *Strat. Manag. J.* 9(2): 197-205.

Prüfer J (2011) Competition and Mergers among Nonprofits. *J. Comp. Law Econom.* 7:69-92.

Prüfer J (2016) Business Associations and Private Ordering. *J. Law Econom. Org.* 32:306-358.

Rennhoff AD, Owens MF (2012) Competition and the Strategic Choices of Churches. *AEJ Micro* 4:152-170.

Rosenski N (2012) *Die wirtschaftliche Bedeutung des Dritten Sektors* (Statistisches Bundesamt, Wirtschaft und Statistik):209-218.

Sanchez-Burks J (2002) Protestant Relational Ideology and (In)attention to Relational Cues in Work Settings *J. Personality Soc. Psych.* 83:919-929.

Sanchez-Burks J (2005) Protestant Relational Ideology: The Cognitive Underpinnings and Organizational Implications of an American Anomaly. *Res. Org. Behavior* 26:265-305.

Schneider SC, De Meyer A (1991) Interpreting and responding to strategic issues: The impact of national culture. *Strat. Manag. J.* 12:307-320.

Schwartz SH, Huismans S (1995) Value Priorities and Religiosity in Four Western Religions. *Soc. Psych. Quart.* 58:88-107.

Shaked A, Sutton J (1982) Relaxing Price Competition Through Product Differentiation. *Rev. Econom. Stud.* 49:3-13.

Senger J (1970) The Religious Manager. *Acad. Manag. J.* 13: 179-186.

Shu T, Sulaeman J, Yeung PE (2012) Local Religious Beliefs and Mutual Fund Risk-Taking Behaviors. *Manag. Sci.* 58:1779-1796.

Sloan FA (2000) Not-for-profit ownership and hospital behavior. Culyer AJ, Newhouse JP ed. *Handb. Health Econom.*:1141-1174.

Simon M (2010) *Das Gesundheitssystem in Deutschland. Eine Einführung in Struktur und Funktionsweise.* (3rd ed.) (Huber, Bern).

Spenkuch JL (2017) Religion and Work: Micro Evidence from Contemporary Germany.Journal of Economic Behavior and Organization. 135: 193-214

Spenkuch JL, Tillmann P (forthcoming) Special Interests at the Ballot Box? Religion and the Electoral Success of the Nazis. American Journal of Political Science.

Stone MM, Brush CG (1996) Planning in Ambiguous Contexts: The Dilemma of Meeting Needs for Commitment and Demands for Legitimacy. *Strat. Manag. J.* 17:633-652.

Thomsen S, Pedersen T (2000) Ownership Structure and Economic Performance in the Largest European Companies. *Strat. Manag. J.* 21:689-705.

Tracey P (2012) Religion and Organization: A Critical Review of Current Trends and Future Directions. *Acad. Manag. Annals* 6:87-134.

Williamson O (1979) Transaction Cost Economics: The Governance of Contractual Relations. *J. Law Econom.* 22:233-261.

A Appendix

A.1 Proof of Proposition 3

First, we have to establish how the equilibrium service intensity, $X^*(s)$, and the difference in service intensities between providers, $X_C^*(s) - X_P^*(s)$, change across severity levels.

According to (4), $C(X(s=1)) < C(X(s=2)) \forall X > 0$ but, according to (1), $B(X(s=1)) = B(X(s=2))$. Applying these relations to (11), c.p. the RHS is less negative for $s=2$ than for $s=1$. Additionally, because $C(X(s=1)) < C(X(s=2))$, the LHS is more negative for $s=2$ than for $s=1$. Hence, when moving from $s=1$ to $s=2$, any provider reduces

$$X^*(s) : X^*(s=1) > X^*(s=2). \tag{20}$$

Define $\Delta X^*(s) \equiv X_C^*(s) - X_P^*(s)$. It follows from (12): $\Delta X^*(s) > 0$.

How does changing severity s affect $\Delta X^*(s)$? A Protestant provider, after a change from $s=1$ to $s=2$, reduces $X(s)$ by the amount dictated by the different slopes of the cost functions, $C_X(s=1, X(s=1))$ and $C_X(s=2, X(s=2))$, according to (10). A Catholic Provider does the same, according to (11), but additionally reduces $X(s)$ because the demand effect of caring for one's community, captured by $\frac{N(B(X(s)))}{N_X(B(X(s)))}$, is weaker for the smaller set of $(s=2)$-patients than for the $(s=1)$-patients the provider will treat, due to $C(X(s=1)) < C(X(s=2))$:

$$X_C^*(s=1) - X_C^*(s=2) \quad > \quad X_P^*(s=1) - X_P^*(s=2) \tag{21}$$

$$\Leftrightarrow \quad \Delta X^*(s=1) \quad > \quad \Delta X^*(s=2) \tag{22}$$

Now we have to show how this affects average revenues. (22) implies

$$\frac{X_C^*(s=1)}{X_C^*(s=2)} > \frac{X_P^*(s=1)}{X_P^*(s=2)}. \tag{23}$$

Because of (1) and (2), (23) translates into:

$$\frac{N_C^*(s=1)}{N_C^*(s=2)} > \frac{N_P^*(s=1)}{N_P^*(s=2)} \tag{24}$$

Substituting (15) in (16) and rearranging gives:

$$R(1)\left(\frac{N_P^*(s=1)}{N_P^*(s=1)+N_P^*(s=2)} - \frac{N_C^*(s=1)}{N_C^*(s=1)+N_C^*(s=2)}\right) > R(2)\left(\frac{N_C^*(s=2)}{N_C^*(s=1)+N_C^*(s=2)} - \frac{N_P^*(s=2)}{N_P^*(s=1)+N_P^*(s=2)}\right) \tag{25}$$

Multiplying both sides by $(N_C^*(s=1)+N_C^*(s=2))(N_P^*(s=1)+N_P^*(s=2))$ yields:

$$R(1)\left(N_P^*(s=1)N_C^*(s=2) - N_C^*(s=1)N_P^*(s=2)\right) > R(2)\left(N_P^*(s=1)N_C^*(s=2) - N_C^*(s=1)N_P^*(s=2)\right) \tag{26}$$

After rearranging and using that $R(1) < R(2)$, by definition, we obtain

$$\frac{N_C^*(s=1)}{N_C^*(s=2)} > \frac{N_P^*(s=1)}{N_P^*(s=2)}, \tag{27}$$

which is identical to (24). *Q.E.D.*

A.2 Proof of Proposition 4

Define $G(X_j^*(s)) \equiv \left[B(X_j^*(s)) - C(X_j^*(s))\right] N^{\rho}(B(X_j^*(s)))$. Then we can simplify (17) to:

$$Max_n \quad EV_j \;=\; \frac{2n-1}{2n}\sum_{s=1}^{2} G(X_j^*(s)) - nF \tag{28}$$

The solution to (28) at every s is:

$$n_j^* = \sqrt{\frac{G(X_j^*(s))}{2F}}, \tag{29}$$

which is increasing in $G(X_j^*(s))$. Because $X_j^*(s)$ was set in order to maximize $G(X_j^*(s))$—see (11)—we obtain $G(X_C^*(s)) > G(X_P^*(s))$. It follows that $n_C^* > n_P^*$.

By definition, the number of treatment areas is discrete. Hence, the optimal number of treatment areas is actually determined by the integer m_j^* at which $(EV_j(n_j^*) - EV_j(m_j^*))$ is minimized. Because $n_C^* > n_P^*$, in expectation $m_C^* > m_P^*$. Proposition 4 follows. *Q.E.D.*

A.3 Proof of Proposition 5

(i): If δ increases—and N_X increases accordingly—the RHS of (11) becomes more negative. Increasing δ strengthens the effect of differences in, $B(\cdot) - C(\cdot)$. (ii): Because of (i), increasing δ increases the difference between both sides in (20) and, accordingly, in (22). Hence:

$$\frac{\partial X^*(s=1)}{\partial \delta} > \frac{\partial X^*(s=2)}{\partial \delta} > 0 \Rightarrow \frac{\partial(\Delta X^*(s=1))}{\partial \delta} > \frac{\partial(\Delta X^*(s=2))}{\partial \delta} \quad Q.E.D.$$