Does Nonprofit Status Signal Quality?

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ABSTRACT

A popular theory for why firms take nonprofit status is that it is a signal of quality. This paper offers a simple, empirical test of this theory. If nonprofit status signals quality, surely nonprofit firms would want to ensure that consumers are aware of this. A natural way for firms to do this is to indicate their nonprofit status in their advertising. Taking this cue, we conducted a survey of over 2,800 firms in the hospital, nursing home, or child care industries in order to determine whether nonprofit firms communicate their status to consumers on their Web sites or yellow pages listings. We find that fewer than 7.5 percent of nonprofit firms signal their status in yellow pages listings, only 25 percent do so on their home pages, and 30 percent do so on their about-us pages. Indeed, over 35 percent never signal their nonprofit status on their Web sites. Our evidence does not support the hypothesis that nonprofit status is a signal of quality.

1. INTRODUCTION

Why do firms take nonprofit status? The literature on law and economics and the theory of the firm has offered four major theories. First, promoters[1] who have quasi-altruistic motives, such as providing high-quality service, take nonprofit status to financially support that motive

1. Because a nonprofit firm, unlike a for-profit firm, does not technically have an owner, we will refer to the would-be owners as principals, promoters, or entrepreneurs.

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(Newhouse 1970; Lakdawalla and Philipson 1998). Second, nonprofit firms address unsatisfied demand for government-funded provision of certain public goods (Weisbrod 1975). Third, some profit-maximizing firms take nonprofit status simply because it promises a tax subsidy; this is smugly called the for-profit-in-disguise model.[2]

The fourth and most popular theory in the literature, however, is that firms take nonprofit status because that status is a signal of quality (Hansmann 1980, 1996; Easley and O'Hara 1983; Weisbrod and Schlesinger 1985; Hirth 1999; Glaeser and Shleifer 2001; and see Malani, Philipson, and David [2003] for positive citations to the signaling theory). The theory starts with the premise that there are certain product or service markets in which consumers and producers may be able to contract over quantity but not quality. The reason may be that the consumer cannot observe product quality (nonobservability) or prove to a court that the agreed-on quality was not provided (nonverifiability). In these markets, profit-maximizing firms have an incentive to shirk on quality in order to reduce costs and increase take-home profits. Nonprofit status is a solution because it removes the profit incentive.[3] On the margin, cost-cutting through the reduction of noncontractible quality will not increase the nonprofit principal's take-home pay. Therefore, she has no incentive to shirk in this manner. From the consumer's perspective, then, nonprofit status is a signal that a firm will provide the noncontractible quality it promises.[4]

2. This theory raises two questions: why would a profit maximizer take nonprofit status and why do all firms not take advantage of the nonprofit subsidy? The answer to the first is that nonprofit status allows employees to take home profits in the form of competitive wages; only the distribution of what economists call rents is prohibited. This is the so-called nondistribution constraint. The answer to the second question could be that principals of firms with a cost advantage might offer a take-home pay (that is, rents after corporate income taxes) that is greater than competitive wages. Alternatively, some firms may be better able to evade the nondistribution constraint through the use of perquisites (David 2004).

3. The signaling theory posits that all firms are at least partially profit maximizing. Some take nonprofit status because doing so maximizes profits. They distribute those profits in the form of perquisites. Because perquisites are an imperfect substitute for cash, their distributions still reduce profit incentives and thus the incentive to shirk on noncontractible quality.

4. A related theory is that firms choose nonprofit status not to signal to consumers that they will not shirk but to signal to workers that they will not shirk on terms of employment or work conditions (Francois 2000).

The purpose of this paper is to test empirically this signaling theory.[5] Direct tests of whether nonprofit firms produce greater noncontractible quality are impossible if product quality is nonobservable. If product quality is merely nonverifiable, it is still likely that a researcher will have difficulty measuring that quality for the same reasons a court would. In any case there is an exhaustive literature on whether nonprofit firms produce higher quality than do for-profit firms. Recent systematic reviews find the evidence inconclusive (Ortmann and Schlesinger 2003; Schlesinger and Gray 2005; Malani, Philipson, and David 2003; Sloan 2000).

Direct surveys of whether consumers think nonprofit firms are more trustworthy are available, but their conclusions are mixed. Schlesinger, Mitchell, and Gray (2004) reviewed surveys between 1985 and 2000 and found that, although roughly two-thirds of respondents see nonprofit hospitals as more trustworthy,[6] a majority of respondents also thought for-profit hospitals provided higher quality care, and one-third of respondents were unable to provide a coherent definition of nonprofit ownership. More important, it is unclear whether surveys actually measure true and strongly held beliefs or just cheap talk. None reviewed by

5. For a theoretical critique of signaling theory, see Ortmann and Schlesinger (2003). They argue, among other things, that the theory mistakenly assumes that the nondistribution constraint is well enforced and that nonprofit status may remove the profit incentive but in its place promoters may substitute a preference for something other than quality, such as laziness. (The authors also review the empirical literature on the theory, but that analysis often appears to confuse the signaling theory with the altruism theory of Newhouse [1970] and Lakdawalla and Philipson [1998].) In addition, Malani (2001) notes that there are many different signals of quality besides organizational form. These include malpractice liability, report cards, and reputation. A challenge for the quality-signaling theory of nonprofit status is explaining why it persists in the presence of alternative signals of quality (and vice versa). A general criticism of all the major economic theories of nonprofit status is that they do not explain why the law allows only certain firms in certain markets to take nonprofit status and why the law grants the sorts of tax benefits (and imposes the sorts of tax costs, as Malani and Choi [2005] note) that it does. For instance, critics of the signaling theory might ask: why are firms in other markets with noncontractible quality not allowed to take nonprofit status? That is, why are lawyers or auto mechanics not allowed to take nonprofit status?

6. Notably, Mauser (1993) surveyed parents of children in nonprofit day care centers and Towers Perrin (1995) surveyed consumers in the process of choosing health care plans, and they found that 25 and 46 percent of respondents, respectively, said they trusted nonprofit firms more than for-profit firms. However, a 1996 survey by the Roper Center for Public Opinion Research at the University of Connecticut found that its respondents were evenly split between those who trusted and those who distrusted nonprofit firms (Ortmann and Schlesinger 2003, p. 99).

Schlesinger, Mitchell, and Gray correlate responses to actual consumer decisions.

The economics literature has produced two indirect but creative tests of the signaling theory, but neither study is determinative. The first, Philipson (2000), begins with the observation that if nonprofit status signals higher noncontractible quality, then consumers should be willing to pay and a nonprofit firm should be able to charge a higher price than a for-profit firm, holding constant all observable features of the two firms. Philipson uses data from the nursing home industry to test this prediction but finds no statistically significant difference between the prices of nonprofit and for-profit homes. His finding, however, is of limited value. The nursing home industry is subject to a myriad of price, quantity, and quality regulations that render price data unreliable.[7]

A second study that tests the signaling theory is Chou (2002). Chou examines the quality of care—as measured by various health outcomes—that nonprofit and for-profit nursing homes provide to two populations of nursing home residents: one that has the assistance of family members to monitor the quality of the home and one that does not. The latter population is said to suffer from asymmetric information vis-à-vis the home. Chou finds that nonprofits provide better quality care than for-profits to residents without family but no better care than for-profits to residents with family. Although Chou's study is revealing, it has some shortcomings. For example, many of the health outcomes examined are verifiable, and Chou does not control for price. More puzzling, however, is that the population that suffers from asymmetric information does not appear to seek out nonprofit homes despite their superior performance.[8]

Our paper adds to this literature a relatively more direct and what we hope is a more compelling test of the signaling theory. If nonprofit status signals quality, surely nonprofit firms would want to ensure that

7. Regulations include Medicare financing and thus price setting and quality regulation for skilled nursing facilities, state certificate-of-need laws, and medical malpractice liability. For further commentary on Philipson's empirical work (2000), see Vogt (2000). For empirical work along the lines of Philipson's but challenging the signaling-to-worker hypothesis of Francois (2000), see Leete (2001). Leete surveys wages of 1.4 million workers in industries with mixed nonprofit and for-profit production in 1990 and finds that nonprofit workers make more than for-profit workers in half the industries and less than for-profit workers in the other half of industries.

8. Evidence regarding the outcomes of residents with and without asymmetric information at nonprofit homes is not offered either. This information would offer another way to determine the credibility of the study's findings.

consumers are aware of their nonprofit status. A simple way facilities could broadcast such a signal would be to add it to their names (for example, the Ravenswood Nonprofit Hospital or the Edgewater Nonprofit Nursing Home). This sort of signaling is unheard of. Assuming that this fact by itself does not sink the signaling theory, one might suppose that firms would take other steps to signal their status when it is not otherwise obvious. For example, they might indicate their nonprofit status on their Web site or in yellow pages advertisements. Taking this cue, we conduct a survey of over 1,800 nonprofit hospital and nursing home firms' Web sites and yellow pages advertisements. We also conduct a survey of nearly 1,000 yellow pages advertisements in the day care industry. The goal is to determine whether nonprofit firms signal their status—a fundamental assumption of the signaling theory.[9]

We conclude that there is little direct support for the hypothesis that nonprofit status signals quality. We infer this from the fact that less than 7.5 percent of nonprofit firms signal their status in yellow pages advertisements, only 25 percent do so on their home pages, and 30 percent do so on their about-us pages. Indeed, over 35 percent never signal their nonprofit status.

The remainder of this paper may be outlined as follows. Section 2 justifies our test of the signaling hypothesis. Section 3 presents our sampling design and summarizes our data. Section 4 reports the results of our empirical analysis. The conclusion discusses the limitations of our study and suggestions for future research.

2. Test

We propose to test the signaling theory by examining whether nonprofit facilities in three markets—the hospital, nursing home, and child care markets—indicate their nonprofit status on their Web pages and in their yellow pages listings. The power of this test depends roughly on four

9. Two related studies attempt to determine if consumers are aware of the nonprofit status of firms. First, Mauser (1993) surveyed parents of children in nonprofit day care centers. Only 56 percent of parents were able to correctly identify that their day care center was nonprofit, and only 14 percent said this was an important consideration in their choice of day care center. Second, the Roper Center conducted an opinion poll after a series of scandals occurred at Columbia/HCA, a for-profit hospital chain. Thirty percent of respondents incorrectly identified the chain as nonprofit, 12 percent correctly identified it as for profit, and the rest stated that they did not know. Although both studies suggest that consumers are not aware of the nonprofit status of firms, the results are not terribly compelling because Mauser does not survey for-profits and the Roper Center survey does not focus on consumers and would-be consumers of Columbia/HCA.

assumptions about purchasing in these markets. First, consumers choose the hospital, nursing home, or child care center they patronize. Second, consumers value not just quantity but also quality in these markets, and they seek information on this quality. Third, consumers in these markets utilize Web pages and/or yellow pages as sources of information on the quality of facilities. Finally, the cost of mentioning a facility's nonprofit status on a Web site or in a yellow pages listing is less than the value of the signal to the firm's revenue or, better, the costs are trivial. Under these assumptions, the signaling theory predicts that the nonprofit facilities in each of the three markets will communicate their nonprofit status on their Web pages and in their yellow pages listings. If they do not, then the data do not validate the signaling theory.

It is reasonable to suppose that these assumptions are satisfied. It is not controversial that consumer choice is relevant in nursing home and child care markets, although the elderly may rely on their adult children as agents in the former market. There is also growing evidence that whereas patient admission into hospitals was previously driven entirely by physician recommendation, it is now driven by a combination of physician recommendation and patients' personal choices (McMillan 1981; Kurz and Wolinsky 1985; Christensen and Inguanzo 1989; Andaleeb 1994; Endresen and Wintz 2002). Indeed Bell and Vitaska (1992) report that patients are more likely to feel that advertisements influence their choice of hospital than physicians are to feel that advertisements influence their choice of hospital for patients.

Nor is it controversial that patients care about and seek information on quality in these markets. For example, a recent HealthGrades Inc. survey (HealthGrades 2004) found that 40 percent of consumers consider a hospital's quality ratings in making their hospital choice. Further evidence is the Center for Medicare and Medicaid Service's (CMS) investment in the Hospital Quality Initiative, which is focused mainly on providing information on quality to consumers.

There is evidence that consumers rely on Web pages or yellow pages for information on quality, although most of this evidence focuses on the hospital industry. As a general matter, Andaleeb (1994) finds that patients are increasingly aware of hospital advertising (and that this advertising drives patient decision making). With respect to the use of Web sites, Jensen (2005) interviewed three hospital marketing executives and found that a growing proportion of patients actively seek out hospital information via the Internet and act on it. According to Haugh (2004), survey data show that more than 10.3 million online consumers

used a hospital Web site in the third quarter of 2003. Patients also report that the Internet is the second most convenient resource (behind their doctors) for access to health information. Finally, according to the Hospital Internet Marketing Report, 99 percent of hospitals have active Web sites, and 82 percent use them for marketing purposes (Romano 2003).

To obtain data on yellow pages use, we interviewed the marketing directors of three hospitals, two in Boston and one in Washington, D.C.[10] They indicated that, although yellow pages advertising is not a top priority and does not take up a serious portion of their budget, it is inevitably undertaken because it is expected by consumers and employed by all their competitors. The director of one of the Boston hospitals indicated that advertising in the yellow pages is cost-effective, although "most people are moving toward the Web as a resource for telephone and address info and these options are free of charge." What is more interesting, all three directors stated that, all else being equal, they would include their nonprofit status in their advertisements regardless of the medium because they felt consumers view that information favorably. (That having been said, none of the directors, when asked, knew if their current yellow pages ads actually had mentioned their nonprofit status.)

The final assumption behind our proposed test concerns the costs of signaling on a Web site or in the yellow pages. The fixed costs of setting up and the annual costs of maintaining a hospital's entire Web site can be large. For example, Romano (2003) found that setting up a low-end Web site can cost a hospital $100,000, and maintaining a large academic center's Web site can cost $1–$2 million per year. Indeed, the Children's Hospital of Philadelphia invested approximately $16 million to overhaul its Web site in 2001 (Children's Hospital of Philadelphia 2001). Even one of the marketing directors we personally interviewed stated that updating the content of his Boston hospital's entire Web site costs roughly $100,000 per year. These numbers appear daunting, but they tell us the costs of entire Web sites, not the cost of narrowly modifying a Web site to include a reference to the hospital's nonprofit status. The cost of such a reference is a tiny fraction of the total expense of the Web site. The primary drivers of the cost of a nonprofit reference are space constraints, which in turn are a function of the attention spans of Web site viewers. Intuitively, the costs are highest on a Web site's home page,

10. The marketing director of one of the Boston hospitals requested that the hospital not be named. The other Boston hospital is Faulkner Hospital, and the Washington, D.C., hospital is the Howard University Hospital.

Table 1. Yellow Book USA Advertising Rates in Dollars, July 2006

	Full Page	Quarter Page	Five Lines
Boston	2,579	689	130
Denver	2,788	766	136
Phoenix	3,025	930	140
Richmond, Virginia	1,685	455	70

which is typically no larger than one computer screen. The costs are lower on the about-us page, which can be several scrollable computer screens long. Conditional on location, the costs of making a nonprofit reference are no different than the costs of providing other quality signals, such as information on accreditations, religious affiliations, and academic affiliations or quotes from satisfied consumers.

In order to obtain evidence on the cost of a yellow pages advertisement, we contacted Yellow Book USA in July 2006. It quoted for us monthly rates for full-page, quarter-page, and five-line advertisements for four representative cities covered in our data (see Table 1). A sales representative for the yellow pages in Philadelphia quoted us rates that are roughly in line with, though at the top of, this range: $3,331 per month for a full-page, $554 per month for a quarter-page, and $85 per month for a five-line advertisement. While we find price variation across cities, the magnitude of the expenditure for even a full-page advertisement is very small from the perspective of any hospital in our sample. This was confirmed in our interviews with hospital marketing directors.

Before we proceed to apply our test, we note that one must be cautious when interpreting our results. Even if one finds—as we do—that nonprofit facilities frequently do not communicate their nonprofit status on their Web sites or in yellow pages listings, that does not imply that the signaling theory is disproved. At best it is evidence that the signaling theory cannot explain communications between certain nonprofit facilities and consumers on the former's Web sites and yellow pages listings. The more cautious interpretation reflects the possibility that there are explanations that can reconcile the signaling theory and our findings. Perhaps (notwithstanding the evidence from Bell and Vitaska [1992]) the target audience for hospital Web sites are doctors rather than patients, that doctors already know the nonprofit status of hospitals, and that doctors tell patients this information so hospitals do not have to. It is also possible that consumers get information on nonprofit status

from media that this paper does not examine, such as television, radio, newspapers, or magazines. Finally, it may be that some patients view nonprofit status as a signal of quality while others view it as a signal of inefficiency. If advertisements cannot discriminate between these two types of patients, hospitals may not find it profitable to communicate their nonprofit status in advertisements. With these admitted limitations of our test, we proceed to the discussion of the data we analyze.

3. DATA

We collect data from three industries. The first is the hospital industry. For this industry we gather data about Web sites and yellow pages listings. The Web site data are a stratified sample of roughly 900 hospitals. The sampling methodology is as follows. We gathered the universe of hospitals from the 2003 American Hospital Association (AHA) annual survey. From each state we randomly drew 20 nonprofit hospitals. (Nonprofit status was verified from the AHA data. If there were fewer than 20, we took as many as we could find.) From this subsample we determined those that did and did not have Web sites. Of those that did, we checked whether the hospitals indicated that they were nonprofit on their home page, their about-us page, anywhere else on the Web site, or not at all. (We also determined whether the hospitals indicated if they were religious or academically affiliated on their Web sites.) We merged these data with AHA data on various hospital characteristics.

We also gathered data on yellow pages listings in this industry. For these data we gathered 2002 yellow pages for 10 medium-sized cities: Boston, Denver, Milwaukee, Oklahoma City, Phoenix, Providence (Rhode Island), Richmond (Virginia), Sacramento, Seattle, and Washington, D.C. From these yellow pages, we randomly sampled roughly 10 nonprofit hospitals per city. We checked whether these hospitals indicated if they were nonprofit or religious in their yellow pages listings.

For the most part, we replicated this methodology for gathering Web site and yellow pages data for the nursing home industry. The salient differences in methodology are, first, that the universe of nursing homes was gathered from the CMS Web site.[11] (Nonprofit status was verified from the CMS data.) Second, the Web site signals data were merged

11. See U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, Medicare: Nursing Home Compare (http://www.medicare.gov/NHCompare/home.asp).

with nursing home characteristic data from the Provider of Services file for fourth quarter 2002.

The third industry we examine is child care (or day care). Because these firms rarely have Web sites, we focus our analysis on their yellow pages listings in the 10 cities listed above. There is no source that provides the universe of child care providers and informs us which are nonprofit. Therefore, we sampled roughly 100 firms with yellow pages listings in each city. We called each provider to determine its nonprofit status, its religious orientation, and whether it was state certified. Then we checked whether those that indicated they were nonprofit, religious, or state certified on the phone indicated this information in their yellow pages listings.

Our Web site data are fairly representative of the nonprofit universe. In the hospital data, although we slightly oversample facilities in the West and smaller facilities (especially those that are also religious), these discrepancies basically disappear when the unit of analysis (or weighting) is beds in nonprofit facilities. In the nursing home data, we oversample facilities in the South and the West, but doing so does not cause any disparity in the distribution of beds relative to the universe of nursing homes.

Table 2 provides summary statistics from the Web site samples for the hospital and nursing home industries.[12] (Data from each facility are weighted by the probability of sampling a bed from that facility out of the universe of all beds in nonprofit facilities in the state where that facility resides. This is the practice throughout, unless otherwise indicated.) Although overall 39 percent of hospital beds and 74 percent of nursing home beds are in for-profit facilities, keep in mind that our sample contains no for-profit facilities. Our goal is to explore whether nonprofit facilities signal their status, not to compare nonprofit and for-profit behavior. Facilities lacking Web sites are excluded from our analysis; this removes 17 percent of sampled hospitals and 19 percent of sampled nursing homes. Although the decision not to have a Web site includes the decision not to signal a facility's status on a Web site, we ignore that decision on the basis of our prior belief that the decision to signal status did not motivate the decision to maintain a Web site.

Hospitals are roughly twice as large as nursing homes in our sample.

12. The statistics are weighted by the number of hospital or nursing home beds in each state, as appropriate. Alternative weighting schemes might focus on facilities or on beds in nonprofit facilities only. Our findings are not, however, sensitive to our use or choice of weights.

Only a fraction of facilities are specialized: 7 percent of hospitals are not general hospitals, 3 percent of nursing homes are self-standing skilled nursing facilities, and 15 percent of homes focus on care for the mentally disabled. Over one-half of hospitals and 40 percent of nursing homes are part of a system (or network) of such facilities.

Examining attributes that are plausibly quality related, we find that 17 percent of hospitals are religious, just over 10 percent of hospitals are teaching facilities, and a quarter have resident training programs. We check if hospitals are part of a Blue Cross/Blue Shield (hereafter, Blue Cross) health plan because these plans impose some quality regulations on participating facilities. We also check if facilities report that they have a long-term plan to improve the quality of care they provide or cooperate with local agencies to improve the health of their communities. Over 90 percent of facilities indicate Blue Cross participation, a long-term plan, or a community orientation. As for nursing homes, nearly a quarter are religious, and 70 percent report Blue Cross participation.

Turning to Web sites, two-thirds and three-fifths of hospitals and nursing homes, respectively, operate their own sites. The remainder employ their system's Web sites. The two types of facilities have remarkably similar patterns of nonprofit signaling. The home page is the most prominent place that nonprofit status is indicated for 20–25 percent of facilities. For a third, the about-us page is the most prominent placement. Overall, roughly 65 percent of facilities of each type indicate their status somewhere on their Web sites.

Table 3 provides summary statistics from the yellow pages samples for all three industries we study. The information we gathered focuses on attributes that might bear upon the quality of service. For example, roughly a quarter of nonprofit hospitals and nursing homes and two-fifths of nonprofit child care providers[13] are religious. Nearly three-quarters of hospitals are academic or have an academic affiliation.[14] Only 3 percent of nonprofit child care providers are state certified.

13. Our random sampling of nonprofit and for-profit listings suggests that just under one-half of child care providers are nonprofit.

14. The difference in rates of academic status in the Web site and yellow pages sample can partly be explained by the fact that the yellow pages sample focuses on medium-sized cities, which have a higher concentration of academic medical centers than does the average community.

Table 2. Summary Statistics for Web Site Data

	Hospitals			Nursing Homes		
	Observations	Mean	SD	Observations	Mean	SD
Most prominent Web page indicating nonprofit status:						
Home	741	.18	.38	668	.26	.44
About us	741	.28	.45	668	.31	.46
Elsewhere	741	.16	.36	668	.08	.27
Anywhere	741	.61	.49	668	.65	.48
Facility quality characteristic (1 = yes):						
Religious	741	.17	.38	668	.24	.43
Teaching	741	.12	.32			
Medical school	737	.30	.46			
Resident training	737	.25	.43			
Academic	741	.30	.46			
Blue Cross certified	741	.95	.22	668	.69	.46
Long-term plan	675	.90	.30			
Community oriented	677	.90	.30			
Demographic data:						
Number of beds	741	204	206	668	108	81
Number of admissions	741	9,225	10,188			
Specialized (1 = yes):	741	.07	.26			
Hospital based				668	.22	.41
Self-standing SNF				668	.03	.16
Intermediate care for the mentally disabled				668	.15	.36

Part of a system	728	.52	.50	668	.41	.49
Part of a system per the AHA	741	.54	.50			
Part of a network	741	.33	.47			
Uses system Web site	736	.33	.47	653	.44	.50
East	741	.14	.35	668	.16	.37
South	741	.40	.49	668	.34	.47
Midwest	741	.28	.45	668	.35	.48
West	741	.18	.38	668	.15	.35
Nonprofit market share (by beds in county)	741	.79	.24	645	.26	.07
Market concentration (HHI by beds in county)	741	.55	.35	668	.15	.14
Most prominent Web page indicating religious status:						
Home page	128	.70	.46	150	.62	.48
About-us page	128	.02	.14	150	.64	.48
Elsewhere	128	.00	.00	150	.06	.24
Anywhere	128	.72	.45	150	.86	.35
Most prominent Web page indicating academic status:						
Home page	232	.18	.38			
About-us page	232	.11	.31			
Elsewhere	232	.03	.18			
Anywhere	232	.32	.47			

Note. Observations are weighted by the inverse of the probability of selecting a bed from a specific facility from all beds at nonprofit facilities in that state. Academic hospitals are those that have a teaching component, are affiliated with a medical school, or have a resident training program. SNF = skilled nursing facility; AHA = American Hospital Association; HHI = Herfindahl-Hirschman index.

Table 3. Summary Data on Yellow Pages Listings

			Child Care Providers		
	Hospitals	Nursing Homes	Nonprofit	For-Profit	All
Number of facilities	80	97	467	519	986
Accreditation:					
Number of facilities			13	30	43
Fraction of all facilities			2.8	5.8	4.4
Accreditation in listing:					
Number of facilities			9	24	33
Fraction of all accredited facilities			69	80	77
Religious affiliation:					
Number of facilities	22	23	185	17	202
Fraction of all facilities	27.5	23.7	39.6	3.3	20.5
Religious affiliation in listing:					
Number of facilities	22	6	104	8	112
Fraction of all religious facilities	100.0	26.1	56	47	55
Academic status or affiliation:					
Number of facilities	59				
Fraction of all facilities	73.8				
Academic status/affiliation in listing:					
Number of facilities	12				
Fraction of all academic facilities	20.3				
Nonprofit status in listing	2	7	13		
Fraction with nonprofit status in listing	2.5	7.2	2.8		

Note. Ten medium-sized cities were surveyed: Boston, Denver, Milwaukee, Oklahoma City, Phoenix, Providence (Rhode Island), Richmond (Virginia), Sacramento, Seattle, and Washington, D.C. A hospital is tagged as academically affiliated if it is associated with a medical school in the American Hospital Association data. Data are from 2002.

4. RESULTS

Our analysis begins by inquiring into the frequency with which nonprofit firms fail to communicate their status. Table 2 reveals that nearly 40 percent of hospitals and 26 percent of nursing homes do not indicate their nonprofit status anywhere on their Web sites. The last row of Table 3 provides even stronger evidence against nonprofit signaling. Over 97 percent of nonprofit hospitals and child care providers and nearly 93 percent of nonprofit nursing homes fail to indicate their status in yellow pages listings.

In the Web site data, we draw a distinction between the home page, the about-us page, and other pages because of the different purposes of and constraints on these sites. The home page is the first page all visitors see and acts as a guide to the rest of the Web site. It therefore has the most viewers and the least substantive content. This page is typically just one page long and contains only information the firm wants all

viewers to see. The about-us page is viewed by fewer visitors; they have to navigate their way there from the home page. This page is typically longer because the viewers of the page are more motivated to find information and are patient enough to read a longer Web page. The remainder of the Web site is more like the about-us page but perhaps has fewer visitors. The important feature for our purposes is the limited space on the home page relative to that on the about-us page. This means that quality signals on the home page are more valuable or important in the firm's eyes than those on the about-us page. There are even fewer signals on other Web pages than on the about-us page not because of space constraints but because of topic limitations. The home page and the about-us page are where consumers expect and firms place quality-related information. The reader can confirm this by navigating to any given hospital or nursing home's Web page, as we have done. On the basis of where they indicate their nonprofit status on their Web sites, it does not appear that hospitals or nursing homes view nonprofit status to be an important signal of quality. Among hospitals, only 18 and 28 percent indicate their nonprofit status on their home page or about-us page, respectively. Among nursing homes, the numbers are 26 and 31 percent, respectively.

It might be useful when evaluating these numbers to have a baseline for how much firms communicate other quality-related characteristics. One possible baseline is communication of religious affiliation. While it could be argued that religious affiliation does not indicate quality of service in the same way that nonprofit status does, religious status does likely indicate something about the values of a facility, values that may affect the demand of a certain segment of consumers. Table 2 reveals that only 28 and 14 percent of religious hospitals and nursing homes, respectively, fail to indicate their religious affiliation on their Web pages. Table 3 indicates that no religious hospitals and fewer than half of religious child care providers fail to indicate their religious affiliation in their yellow pages listings. Although religious nursing homes indicate their affiliation only 26 percent of the time in yellow pages listings, they indicate their religious affiliation 86 percent of the time on their Web sites, and even 26 percent is larger than the anemic 7 percent or lower rate for communication of nonprofit status in yellow pages listings. The sense that religious signals are more frequent than nonprofit signals is reinforced in the locational analysis of Web site signals. Religious hospitals indicate their religious affiliation on their home page 70 percent of the time, and religious nursing homes indicate such an affiliation on

their home page 62 percent of the time. These rates suggest much more frequent and prominent signaling of religious affiliation than nonprofit affiliation.

An alternative baseline for judging nonprofit signaling by hospitals is the rate at which academic hospitals signal their academic status. Academic hospitals fail to communicate this status on their Web sites in 68 percent of cases and in yellow pages listings in 80 percent of cases. A comparison of these numbers with the roughly 40 percent and 93 percent noncommunication rates, respectively, for nonprofit status suggests that academic centers signal that status at rates no higher than nonprofits signal their status. This finding does not, however, provide a great deal of support for the signaling theory. It is possible that being an academic center is no better a signal of quality than is nonprofit status. Consumers may view such a hospital as the place where young, lower quality doctors are in training. Moreover, academic status is a baseline only for hospitals. Neither nursing homes nor child care providers have academic affiliations.

An alternative baseline specifically for child care providers is the rate at which these facilities signal accreditation from a state or other agency. Accredited providers fail to mention their accreditation in yellow pages listings in only 21 percent of cases. This finding suggests a much higher rate of signaling than that for nonprofit status. And unlike religious or academic status, accreditation is unambiguously a signal of better quality service, much as the signaling theory suggests nonprofit status is.[15]

A concern with using either religious status or academic status (for hospitals) as a baseline is that there may be substitution among signals.[16] This substitution may take two forms. First, because religious and academic affiliations tend to be nonprofit,[17] firms that are religious or

15. A fourth possible baseline is the rate at which for-profit firms communicate their quality. The problem with this comparison is that the baseline modifies not just the signal but also the organizational form of the firm. If the two firms behave differently, the baseline will be contaminated. Another problem is that our hospital and nursing home data include only nonprofit firms. So it is possible to compute this baseline only for child care providers' yellow pages listings. As is reported in Table 3, accredited for-profit firms are more likely to signal their accreditation (80 percent) than nonprofit firms are to signal their accreditation (69 percent) or their nonprofit status.

16. Accreditation of child care providers is negatively correlated with nonprofit status. Of the 43 accredited facilities in our yellow pages sample, 30 were for profit (see Table 3).

17. According to data from the American Hospital Association, the odds of a religious hospital being nonprofit is 350 to 1. (Of 757 religious hospitals in that database, only 2 were for profit.) The odds of a hospital affiliated with a medical school being nonprofit is 9 to 1. (Of 997 hospitals that were affiliated with a medical school, 892 are nonprofit,

academic signal they are nonprofit merely by signaling they are religious or academic. This is a plausible interpretation, but not a necessary one. An alternative is that religious or academic firms would like to signal their religious or academic status but not that they are nonprofit. A second form of substitution is that religious or academic status signals not nonprofit status but rather the same quality that nonprofit status signals. In that case, firms that are religious or academic may not need to signal that they are nonprofit to signal to consumers that they provide nonobservable quality.

We address these complications from using religious or academic firms as baselines for nonprofit firms in a simple way. We ask whether nonreligious firms or nonacademic firms are more likely than religious firms or academic firms, respectively, to signal their nonprofit status. The pro-nonprofit-signaling view of both forms of substitution suggests the answer should be yes. Assuming that religious status and academic status do not alter a firm's view of the quality-signaling value of nonprofit status, communicating religious or academic affiliation also communicates nonprofit status only if nonreligious firms and nonacademic firms signal nonprofit status at a higher rate than do religious firms and academic firms, respectively. Likewise, if firms that are religious or academic do not need to signal quality via nonprofit status, then nonreligious firms and nonacademic firms should employ the nonprofit signal at a higher rate than do religious firms and academic firms, respectively.

To check this, Table 4 gives the difference in the probability with which hospitals or nursing homes with and without certain features signal their nonprofit status on various Web pages. Religious hospitals are less likely (−7.8 percent) to signal nonprofit status on their about-us page. Academic hospitals (measured by whether they are on the Association of American Medical School's Council of Teaching Hospitals, are affiliated with a medical school, have 20 or more residents or interns training at the facility, or any of the above) are less likely to signal nonprofit status on their home page but more likely to signal it on their about-us page. (Overall, however, there is no significant difference in

which implies an odds ratio of 9 to 1.) Similarly, of 249 hospitals on the Association of American Medical School's Council of Teaching Hospitals, only 12 are for profit, which implies an odds ratio of nearly 20 to 1. Of 431 hospitals with 20 or more residents or interns, only 20 were for profit, which implies an odds ratio of more than 20 to 1. According to our yellow pages data, the odds of a religious child care facility being nonprofit are more than 10 to 1. (From the data in Table 3, it is apparent that of 202 religious child care providers, only 17 were for profit.)

Table 4. Propensity to Indicate Nonprofit Status on a Web Site

	Hospitals				Nursing Homes			
Covariate	Home Page	About Us	Elsewhere	Anywhere	Home Page	About Us	Elsewhere	Anywhere
Religious	−.009	−.078	−.013	−.099	−.034	.011	.039	.016
	(.807)	(.069)	(.708)	(.040)	(.384)	(.806)	(.148)	(.717)
Teaching	−.096	.109	−.033	−.020				
	(.004)	(.047)	(.391)	(.715)				
Medical school	−.085	.077	−.012	−.020				
	(.002)	(.043)	(.681)	(.602)				
Resident training	−.079	.118	.000	.039				
	(.006)	(.004)	(.989)	(.328)				
Academic	−.080	.075	−.012	−.017				
	(.004)	(.046)	(.671)	(.649)				
Blue Cross	−.162	.139	−.017	−.040	−.042	−.021	.011	−.052
	(.039)	(.033)	(.791)	(.605)	(.265)	(.602)	(.603)	(.198)
Long-term plan	−.111	.016	.026	−.070				
	(.049)	(.791)	(.559)	(.244)				
Community oriented	−.054	.004	−.065	−.115				
	(.283)	(.945)	(.192)	(.039)				
No other quality feature	−.072	−.006	−.060	−.139	.018	.004	−.041	−.019
	(.491)	(.968)	(.566)	(.428)	(.677)	(.933)	(.180)	(.699)
Not religious or academic	−.005	−.057	−.077	−.139				
	(.967)	(.672)	(.379)	(.378)				

Note. Data are differences in the probability of signaling nonprofit status. *P*-values are in parentheses. Observations are weighted by the inverse of the probability of selecting a bed from a specific facility from all beds in nonprofit facilities in that state. Academic hospitals are those that have a teaching component, are affiliated with a medical school, or have a resident training program.

their propensity to signal anywhere on their Web sites. Moreover, our analysis may be biased toward finding substitution specifically on home pages because of the space constraints on that page. The mere fact of signaling academic status reduces space available for and thus the probability of signaling nonprofit status on a home page.) If we combine academic and religious measures, we find that nonreligious, nonacademic hospitals are no more likely to signal nonprofit status than are other hospitals. Finally, we find results similar to academic status when we employ plausible quality-related characteristics other than religious or academic status. These include participation in Blue Cross, having a long-term plan for quality improvement, or being community oriented. The results for nursing homes are even less supportive of the nonprofit signaling theory. Being religious or having some other quality-related characteristic has no significant association with the propensity to indicate nonprofit status on a hospital's Web site.

The usual caveat to univariate analyses is that they may lead to spurious correlations. For example, if academic affiliation is correlated with location in the eastern region, and location in the eastern region is responsible for the signaling behavior, we would draw the wrong conclusion from the data in Table 4. Therefore, we estimated a multivariate logistic regression in which the dependent variable is the most prominent Web page on which a nonprofit facility communicates its status. The independent variables include measures of quality and characteristics such as size, scope, system affiliation, and region. We also include controls for the market concentration in and nonprofit share of the local market (defined as the county). The rationale for including a measure of concentration (the Herfindahl-Hirschman index) is that if nonprofit status is a signal of quality, this signal is not necessary in markets where a facility enjoys a near monopoly anyway, that is, markets with high market concentration. The rationale for including nonprofit share is that if all firms are nonprofit, there is no need to signal nonprofit status because it would not differentiate a facility from its competitors.[18]

The results, which are reported as odds ratios in Table 5, suggest that nonprofit hospitals are half as likely to communicate their status on their about-us page if they are religious. They are also less likely to communicate their status on pages other than their home or about-us pages

18. Although our samples of hospitals and nursing homes are limited to nonprofits, the nonprofit share and Herfindahl-Hirschman covariates track for-profit and public competitors.

Table 5. Odds Ratios for Signaling Status on a Web Site

	Hospitals				Nursing Homes			
Covariate	Home Page	About Us	Elsewhere	Anywhere	Home Page	About Us	Elsewhere	Anywhere
Religious	1.132	.456*	.944	.556*	.916	1.016	1.844^{+}	1.161
	(.28)	(2.05)	(.14)	(2.11)	(.38)	(.07)	(1.95)	(.71)
Teaching	.652	.997	.637	.625				
	(.65)	(.01)	(.93)	(1.36)				
Medical school	.93	1.117	.181**	.631				
	(.10)	(.19)		(1.00)				
Residency program	.985	1.196	4.606*	1.772				
	(.01)	(.28)	(2.27)	(.99)				
Blue Cross	.505	.655	.766	.219*	.835	1.106	.637	.809
	(1.42)					(.31)	(1.00)	(.64)
Long-term plan	.538	.751	1.485	.565				
	(1.31)	(.55)	(.62)	(1.39)				
Community oriented	1.943	.998	.551	.944				
	(1.53)	(.00)	(1.39)	(.18)				
Log beds	.831	.525*	1.368	.696	.864	.781	1.103	.711^{+}
	(.59)	(2.32)	(.88)	(1.57)	(.93)	(1.87)	(.43)	(1.91)
Log admissions	.999	2.074**	1.065	1.706**				
	(.00)	(2.80)	(.23)	(2.60)				
Specialized:	1.382	.24^{+}	2.825	.986				
	(.66)		(1.61)	(.03)				
Hospital based					.312**	1.196	1.486	.528^{+}
					(4.50)	(.57)	(.68)	(2.01)
Self-standing SNF					1.435	.746	.698	.873
					(1.30)	(.69)	(.55)	(.27)
Intermediate care for mentally disabled					1.289	.262		.379
					(.31)	(1.71)		(1.46)

Part of system[a]	.941	1.064	.738	.917	.953	.92	1.736	1.02
	(.18)	(.33)	(.89)	(.31)	(.13)	(.28)	(1.05)	(.09)
Part of network	1.29	.763	1.415	1.106				
	(.83)	(1.58)	(1.00)	(.35)				
Uses system Web site	1.27	1.679	.46*	1.389	.708	1.887*	1.42	1.563
	(.75)	(1.61)	(2.05)	(1.26)	(.99)	(2.72)	(1.35)	(1.87)
Midwest	1.296	1.931	1.601	2.166*	.977	1.65	.384	1.007
	(.51)	(1.34)	(1.28)	(2.31)	(.09)	(1.36)	(1.71)	(.02)
South	3.39**	3.578**	.567	3.778**	1.778	1.298	.291	1.292
	(3.01)	(3.10)	(1.14)	(3.50)	(1.81)	(.60)	(1.89)	(.94)
West	5.518**	2.173	1.515	6.766**	1.693*	1.246	.219*	1.098
	(3.85)	(1.18)	(1.05)	(3.83)	(2.04)	(.76)	(2.64)	(.43)
Nonprofit market share (by beds in county)	1.854	1.567	.757	1.849	.519	.787	22.92	.977
	(.99)	(.93)	(.32)	(1.29)	(.63)	(.19)	(1.13)	(.02)
Market concentration (HHI by beds in county)	1.000	1.000	1.000	1.000	.204	.534	2.508	.19
	(.72)	(.52)	(.99)	(1.30)	(1.88)	(.65)	(.56)	(1.54)
Observations	667	667	667	667	613	613	611	613

Note. *Z*-statistics are in parentheses. Observations are weighted by the inverse of the probability of selecting a bed from a specific facility from all nonprofit beds in that state. SNF = skilled nursing facility; HHI = Herfindahl-Hirschman index.

[+] Statistically significant at the 10% level.

* Statistically significant at the 5% level.

** Statistically significant at the 1% level.

[a] Based on American Hospital Association estimates.

if they are affiliated with a medical school, but they are more likely to do so if they have 20 or more residents or interns.[19] Finally, hospitals that participate in Blue Cross plans are less likely to communicate their status anywhere on their Web sites. Other quality characteristics, the market concentration, and the nonprofit market share, however, do not appear to influence such communication. As for nursing homes, only religious homes appear significantly to signal their nonprofit status, but only elsewhere on a Web site. These results, which are robust to different specifications of covariates (including dropping any covariates that correlate with quality characteristics, cannibalize the sample size, state fixed effects, or have different weighting schemes), suggest that there is some, but not overwhelming, substitution between nonprofit signaling and substitute characteristics.[20]

It is possible, of course, that religious or academic firms that do not signal their status have the same demand for a nonprofit signal as firms that are not religious or academic. Failure to account for this may yield an underestimate of the demand for nonprofit signaling by firms. We address this by adding indicators of quality signals (as opposed to simply indicators of quality characteristics). Specifically, we interacted indicators for whether a firm is, for example, religious with an indicator for whether a firm indicated it is religious on its Web site. The coefficient on the interaction term reveals whether religious firms that indicated they are religious were less likely to indicate they are nonprofit than were other firms. Although the results are not reported in our tables, we found that religious hospitals that signal their religious status on their home pages are less likely to signal their nonprofit status on their home pages but only if the analysis does not weight for sampling probabilities. This finding supports the nonprofit signaling theory. Both religious hospitals and nursing homes that did not signal their religious

19. Because teaching hospitals, medical schools, and residency programs are correlated, it is hard to explain the discrepancy between signaling by the three types of hospitals elsewhere on a Web site. To address possible multicolinearity, although it cannot explain our results, we estimated a model that substituted for these three indicators a single indicator for whether a facility was a teaching hospital, was affiliated with a medical school, or had 20 or more residents or interns. We found no significant association with this variable. The odds ratio in the "elsewhere" regression was .614 ($p = .15$).

20. There are some striking results in Table 5 that do not bear directly upon the nonprofit signaling theory but deserve comment. In particular, hospitals in the South and West are three to five times more likely to signal their nonprofit status in a prominent manner than are hospitals in the East. This finding cannot entirely be explained by the higher prevalence of nonprofits in the East, since the nonprofit share variable controls for that explanation.

status on their about-us pages, however, were less (not more) likely to signal their nonprofit status on their about-us pages. This finding is contrary to the nonprofit signaling theory. Thus, the already limited evidence for substitution becomes muddied when we account not merely for religious status but for whether firms signal their religious status.

5. CONCLUSION

This paper examines whether nonprofit firms in hospital, nursing home, and child care markets communicate their status to consumers. That they do is a key assumption of the theory that nonprofit status is a signal of noncontractible quality. Our analysis of firms' Web sites and yellow pages listings suggests that nonprofits frequently do not communicate their status. We account for the possibility that religious or academic firms have less need to signal that they are nonprofit. But doing this did not dramatically change our findings. Overall, we find limited support for the nonprofit signaling theory.

There are important limitations to our analysis, some of which suggest directions for future research. First, we test whether nonprofits send a signal, not whether consumers receive that signal. (We review literature that examines what consumers think about nonprofits but not whether consumers know firms' nonprofit status.) It would be helpful to conduct a survey to determine whether consumers are able to guess accurately the nonprofit status of their hospitals, nursing homes, or child care providers. Second, our analysis does not examine certain modes of communication that are as significant as yellow pages listings and Web sites. These include word-of-mouth, radio and TV advertising, and other print media such as newspapers and magazines. It would be useful to extend our analysis to data on these media. Third, although our methodology could easily be extended to other markets with mixed for-profit and nonprofit production, it cannot be extended to pure nonprofit markets, such as charities. In these markets firms may take nonprofit status to signal quality but do not have to communicate their status because all firms are nonprofit and consumers know it.

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