OWNERSHIP, BRANDING AND MULTIPLE AUDIENCE CONCERNS IN SERVICE INDUSTRIES: EVIDENCE FROM NURSING HOMES [*]

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Abstract

Previous studies of service industries have focused on the tradeoffs between branded chain and independent ownership of establishments and the role that brands play in bonding/signaling uncertain quality to customers. Multi-unit ownership and the naming of outlets, however, are separate decisions that can be affected by audiences in addition to customers. This study focuses on the nursing home industry and the effects that potential litigants and labor unions have on the ownership and branding of homes. We find that chain ownership, *particularly branded ownership*, is less likely in states with laws that promote litigation and unionization. Our evidence is also consistent with hypotheses contained in the existing literature concerning the role of brand names in bonding/signaling quality to customers and the comparative advantages that larger corporations have in raising investment capital.

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1. INTRODUCTION

A mix of independent and chain-affiliated establishments characterizes the horizontal structures of most service industries.[1] Economic explanations for this mixture have focused on the choice between branded chain and independent (single-unit) ownership and the role of brand names in bonding uncertain quality to customers. This paper extends the literature by providing evidence on why chains do not always brand all their outlets and on how audiences in addition to customers (unions and potential litigants) can affect both the ownership and naming of units.

The standard explanation for the choice between branded chain and independent ownership emphasizes that independent (single-unit) owners have powerful incentives to maximize the values of their units. In some environments, these incentives promote efficient actions, while in others they do not. Of particular concern is the incentive of single-unit owners to "cheat" customers who are unlikely to make repeat purchases at their units. A potential solution to this incentive problem is for these units to be owned by chains with valuable brand names. Branded chains have stronger incentives to deliver promised quality to transient customers, since a customer who is cheated at one unit is less likely to make future purchases throughout the chain. While the empirical evidence on the horizontal structure of service industries is limited to a few industry-specific studies, it generally supports the primary hypotheses that arise from this line of reasoning – branded chain affiliation is most likely at locations and for products where being able to signal/bond quality credibly is most important.[2]

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[1]For example, according to the US Census Bureau (2005), the median establishment in retail trade employed fewer than seven employees in 2002. Approximately, 94 percent of the 727 million firms in this industry owned a single establishment (the average firm owned 1.5 units). The top 50 firms, however, accounted for over 30 percent of sales and payroll. The 457,000 firms that owned 100 establishments or more accounted for over 42 percent.

[2]In contrast to the substantial body of empirical evidence on vertical organization in the service sector (see Lafontaine and Slade, 2007) only a few empirical studies exist on horizontal organization in these industries. Relevant studies include Brickley, et al., 2003 (banking), Mazzeo, 2004 (motels), and Png and Reitman, 1995 (gasoline stations). Shepard, (1993) concentrates on vertical contracting in gasoline retailing, but provides some evidence on independent versus corporate ownership. Jin and Leslie (2009) and Luca (2111) provide evidence on how other sources of

The organizational choices in service industries, however, are more complex than the simple choice between independent and branded ownership by large chains. Joint ownership and the naming of outlets are separate decisions (Hubbard, 2004). A closer look at service industries reveals the coexistence of branded and unbranded chain-owned units, both across and within chains. For example, in 2008, there were nearly 11,000 for-profit nursing homes in the United States (Centers for Medicare and Medicaid Services, 2009). Roughly half were independently owned, while chains owned the remainder. Some chains used a common brand name to affiliate all sibling units, while others used unique names for each home. Still other chains applied a common brand name to only a subset of their homes.[3] Another example is Starbucks' experimentation with unbranded stores in 2009-2010 (using names such as 15th Avenue Coffee and Tea). An interesting question is why do chains use a common brand name to affiliate some units, while they sometimes leave others unbranded?

One potential explanation suggested by much of the literature on umbrella branding is that multi-establishment owners might optimally brand only their higher quality units.[4] Another potentially important, but largely overlooked factor, which might affect both ownership and branding, is concerns about audiences in addition to customers. Names of establishments convey

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information about quality (report cards and ratings on the web) affect the competitive advantage of branded chain affiliation in the restaurant industry.

[3] For example in 2011, Kindred Healthcare (a large national chain) used unique names for virtually all of its nursing homes (e.g., Cambridge Health and Rehabilitation Center and Star Farm Nursing Center in Vermont). In contrast, Golden Living labeled all its homes under the corporate brand name (e.g., Golden Living Center – Gettysburg). Sava Senior Care branded all 28 of its nursing homes in North Carolina, plus one in Georgia, under the name: Brian Center Health and Rehabilitation. Most of its nursing homes in other states were given names that are not easily linked to Sava Senior Care's other units (e.g., Forest Hill Health and Rehabilitation Center in California). Another policy, which is sometimes observed but not studied in this paper, is the use of multiple brand names within the same company.

[4] While the umbrella branding literature focuses on firms that produce multiple products, the general insights from this literature extend to a multi-establishment owner's decision of whether to brand a given unit. See Wernerfelt (1988), Montgomery and Wernerfelt (1992), Choi (1998), Cabral (2000, 2009), Andersson (2000), Pepall and Richards (2002), Hakenes and Peitz (2004 and 2008) and Miklos-Thal (2009). Empirical and experimental research on umbrella branding includes Aaker and Keller (1990), Balachander and Ghose (2003) Bottomley and Holden (2001), Erdem (1998), Sullivan (1990), and Sappington and Wernerfelt (1985).

information to multiple audiences that can affect firm value. For example, using a brand name to communicate that an outlet is affiliated with a "deep-pocketed" corporation could attract additional lawsuits. Various audiences might also exploit common brand names to extract rents from a firm. For example, an increasingly common strategy used by labor unions in the service sector is to engage in "corporate campaigns" that aggressively attack the reputations of targeted firms. The intent is to use the threat of the resulting decline in product demand, negative regulatory responses, labor market reactions, and so on to motivate central management not to resist unionization. These campaigns are less expensive to conduct when chain-affiliated units carry a common brand name (e.g., a negative central corporate image is more likely to affect demands at individual establishments that are clearly labeled as being part of the chain).

This paper employs a large sample of for-profit nursing homes to provide new evidence on the ownership and branding of outlets in service industries. It extends the existing literature in at least five important ways. First, it considers and provides evidence on whether audiences in addition to customers affect these choices. Attention is focused on two key audiences in the nursing home industry – union organizers and potential litigants. Second, it provides evidence on a broader set of organizational choices (branded and unbranded large chain ownership, small chain ownership and single unit ownership). Third, it contributes to the small body of empirical evidence on the factors that affect the choice of business names.[5] Fourth, it provides new evidence on several hypotheses that have been tested in the existing literature using data from a few other specific industries. Fifth, while we concentrates on the naming of outlets, our evidence is also relevant to the more general, but closely related, issue of why multiproduct firms brand some products and not others.

[5] Theoretical papers involving business names include Klein and Leffler (1981), Kreps (1990), Tadelis (1999, 2002), and Mailath and Samuelson (2001). Empirical studies include Horsky and Swyngedouw (1987) and Mcdevitt (2011).

Our empirical tests provide strong and robust support for the hypothesis that audiences in addition to customers affect both the ownership and branding of nursing homes. In particular, we find that 1) chains are relatively less likely to brand homes in states with laws that promote either unionization or patient liability lawsuits and 2) the likelihood of chain ownership (relative to independent ownership) is lower in states with pro-union legal environments.

Our evidence is also consistent with the theoretical literature on umbrella branding. In most models, there is an equilibrium where the brand serves as a signal or bond to customers who are willing to pay for high quality, but cannot observe it prior to purchase (high quality products are branded and low quality products are not). Nursing home services are experience goods for which quality is hard to detect ex ante (even with mandated government monitoring and disclosure requirements). We use income in the surrounding market area as a proxy for potential customers' willingness to pay for quality. Consistent with the hypothesis that brands are used to signal/bond quality, we find that the likelihood of branded large chain ownership, compared to unbranded large chain ownership, increases with income.

Finally, we find that several results in previous studies of the more limited choice between branded chain affiliation and independent ownership extend to the nursing home industry (see footnote 2). In particular, we find that the likelihood of branded chain ownership increases relative to independent ownership with income and population in the market area (the monitoring of employees at chain-owned homes is likely to be less expensive and there are likely to be greater multi-establishment economies in more populated areas in which homes can be clustered geographically). We also find that large corporate chains are more likely to own homes that require significant investment to attract targeted customers (existing theory and evidence suggests that large corporations have a relative advantage in raising large amounts of investment capital).

Limiting our attention to the nursing home industry has both advantages and disadvantages. Important advantages include: 1)) the malpractice legal environment affects the branding decisions of individual establishments that is generally not available to researchers for other non-health industries, 2) the large number of similarly sized establishments from the same industry helps us to control for omitted factors that are likely to confound cross-industry studies[6] and 3) there is significant variation in the market, regulatory, and information environments of nursing homes, as well as in their ownership and branding decisions, which increases the power of our tests. The primary disadvantage of concentrating on one, regulated industry is that more work needs to be done to ascertain the degree to which the results extend to other industries.[7]

The remainder of this paper is organized as follows. Section 2 describes the nursing home industry and our sample. Section 3 presents the empirical model and discusses the predicted effects of the explanatory variables. Section 4 presents the empirical results. The section also summarizes robustness checks and considers whether the observed results could be explained by an alternative to the efficiency-based hypotheses – market power. The study concludes with a brief summary.

2. INDUSTRY BACKGROUND AND SAMPLE

Our empirical predictions (discussed in the next section) are motivated in part by specific institutional features of the nursing home industry. This section summarizes the institutional details that are important for this study and describes our sample.

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[6]There is a broad spectrum of long-term care alternatives (e.g., home care, assisted living centers, and long-term acute care hospitals). Our focus is on skilled nursing homes that are certified by Medicare/Medicaid, which require round-the-clock skilled nursing services. While there is variation among nursing homes in terms of patient mix, services and establishment size, the industry consists of relatively homogenous establishments (Norton, 2000).

[7]Hubbard (2008) notes that for reasons similar to ours most empirical papers on firm boundaries are cross-sectional, single-industry studies. He cites a "new vein" of literature that uses cross-industry data, but notes how their cross-industry nature can limit the authors' ability to interpret the documented "stylized facts."

2.1 Industry Background

Nursing homes are a so-called "mixed industry." In 2008, there were approximately 16,000 certified nursing homes in the United States that served roughly 3.2 million residents (Centers for Medicare and Medicaid Services, 2009). For-profit companies owned 67 percent of the homes, nonprofit organizations 27 percent and government entities 6 percent. This study focuses on for-profit nursing homes, since government and nonprofit owners (e.g., churches) may have goals other than value maximization.

In the empirical analysis, we estimate multinomial probit models that predict the ownership and branding of nursing homes in the United States. The analysis assumes that the locations of the homes are exogenous (predetermined) and that the observed ownership and branding tend to reflect value-maximizing decisions.[8] To justify these assumptions, we note that entry of new nursing homes is restricted in many markets. In 2001, 35 states had Certificate of Need (CON) laws that limited the construction of new nursing homes. In total, there were 41 states that had these laws and/or had placed moratoriums on new construction. While new construction occurs (e.g., to replace older facilities), the number of newly constructed homes in recent years is relatively small. The overall number of certified nursing homes in the United States has declined annually from its peak of nearly 18,000 in 1997 to just under 16,000 homes in 2008 (including nonprofit and government-owned homes). Transfers of ownership through the buying and selling of existing homes, however, are relatively common events (Stevenson, Grabowski and Coots, 2006), thus increasing the likelihood that the observed ownership pattern reflects value maximization. Our primary empirical analysis utilizes all for-profit nursing homes in the United States in 2004. We

[8]Brickley, et al., (2003), Mazzeo (2004), Png and Reitman (1995) and Shepard (1993) make similar assumptions in related studies on service industries.

obtain similar results when we restrict the sample to homes located in states that limited entry and/or the construction of new homes.

The funding for nursing home residents comes from four primary sources: Medicaid, Medicare, private-pay and managed care plans. Medicaid is a joint Federal and state program that funds impoverished residents. Medicare, which covers most people over 65, funds short-term nursing home patients following hospital stays. Together, Medicaid and Medicare fund over 75 percent of nursing home patients at fixed rates that vary by program and service. Historically, Medicare patients generate the highest revenue and profit margins (average revenue of around $500 per patient per day in 2008), while Medicaid patients generate the lowest (average revenue under $150 in many states in 2008).[9] Since price is fixed, competition for the higher margin Medicare patients is based primarily on differential quality and services. Nursing home owners also compete for high-income private pay patients (based on price and other variables), who generally demand high quality and have the ability to pay for it.

Approximately 40 percent of Medicare patients who are released from hospitals use some form of post-acute care (various rehabilitation therapies and services, such as tracheotomy with vent, respiratory with vent, and therapies following joint replacement, hip fracture and stroke). Nursing homes are among the low-cost providers of these services.[10] Owners of nursing homes that are located near short-term acute care hospitals often invest substantial sums in specialized equipment and building remodeling to attract these high-margin patients and their doctors (e.g., constructing separate wings that house private rehabilitation recovery suites and other specialized treatment

[9]The daily rates are from Skilled Healthcare Group (2009). The relative attractiveness of Medicare patients held during our sample year, 2004.

[10]The average estimated cost for post acute care in 2004 was $8,727 for nursing homes compared to $24,384 and $66, 667 for Intermediate Rehabilitation Centers and Long-Term Acute Care Hospitals, respectively (MedPac analysis of CMS claims).

facilities, as well as separate entrances so that the patients do not have to interact with older long-term stay patients).[11]

2.2 Sample

The Online Survey, Certification and Reporting (OSCAR) database, maintained by CMS, provides detailed facility-level information for all certified nursing homes in the United States. Our primary sample consists of 10,249 for-profit nursing homes covered by OSCAR in 2004 (includes homes that were not inspected in 2004, but that had inspection records in 2003 and 2005). While OSCAR provides detailed information on nursing home names, their addresses and whether the home is part of a chain, it does not include the names of owners. Our sample contains 3,759 independently owned homes (one unit owner) and 6,490 chain-owned homes (multiunit owner). We purchased owner names from a private data vendor and merged them with the OSCAR data so that we could identify all sibling units owned by a given company. We then examined the names of the individual homes within each chain to determine which ones had names that clearly linked them to at least one sibling unit. Homes with linked names are coded as branded chain units; others are coded as unbranded chain units.[12] Approximately, 37 percent of the homes (3,759) are independently owned, 19 percent (1,954) are branded chain units and 44 percent (4,536) are unbranded chain units.

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[11]For example, Skilled Healthcare states that it acquired 48 facilities between 2003 and 2009 that targeted "markets with large urban and suburban acute care facilities to increase access to high-acuity patients." It constructed dedicated specialty units to serve Medicare recovery patients in many of its homes. In 2008, it made nearly $50 million in capital expenditures (excluding acquisitions). Other large chains similarly focused increased attention on Medicare patients. (Skilled Healthcare Group, 2009)

[12]We began by developing a computer algorithm to identify whether a chain unit used a common name for some or all sister units. This algorithm excluded various words that are not a brand name, like "rehabilitation" and "center." We then manually checked whether the common name is indeed a brand name using the information from these chains' websites, online documents and advertising brochures. Some chains use multiple brand names (e.g., Manor Care brands some homes with the name Manor Care and others with the Heartland label). We do not differentiate among brands within a chain. Our final sample excludes 346 homes that are listed as chain owned by OSCAR, but which we identified has having one-unit owners.

Our sample contains 580 separate chains. Figure 1 presents the distribution of chain size, as measured by the number of homes. The typical chain is small (average and median of 11 and 4 homes, respectively). For this study, we define a "large chain" as one that owns ten or more homes; others are defined as "small" (other cutoffs are used in the robustness checks). Seventy-eight percent of the chains are small (451 firms); collectively they own 25 percent of the chain-owned homes (1,627).

Table 1 reports the distribution of branding policies for all chains in our sample. Among the 580 chains, 65.7 percent (381) branded no homes; 13.1 percent (76) used brands that linked all their units to siblings; 21.2 percent (123) branded some, but not, all homes ("mixed branding" policy). Among the 129 large chains, 41.1 percent branded no units, 6.2 percent branded all units and 52.7 percent employed a mixed-branding policy.

Table 2 lists the 10 largest chains in our sample, along with their number of branded and unbranded units and states of operation. Similar to other service industries (Hubbard, 2004), ownership concentration in the nursing home industry at the national level is relatively low. Collectively, the top 10 chains owned 1,900 homes (18.5 percent of sample homes). Beverly Enterprises, which operated in 25 states, was the largest nursing home chain in 2004 with 354 homes and a 3.5 percent market share nationwide. All of the ten largest chains branded some units and left others unbranded, except UHS-PRUITT, which used unique names for all 82 homes. There is relatively wide variation in the proportion of branded units among the large chains (zero to 88 percent).

3. EMPIRICAL MODEL AND PREDICTED EFFECTS

Economic theory and evidence (from other industries) suggests that the optimal ownership and branding of nursing homes are likely to vary depending on the market environment. Our empirical analysis considers four ownership/branding types: 1) branded-large chain ownership, 2) unbranded-large chain ownership, 3) small chain ownership, and 4) independent (single-unit) ownership. We follow the common approach of modeling the value created by these discrete organizational choices for a home at a given location as a latent variable. We estimate multinomial probit models that predict the branding/ownership type based on observable, exogenously determined factors.

This section discusses the explanatory variables and the associated predicted effects. Descriptive statistics are provided. For discussion purposes, we classify the explanatory variables into two categories: 1) variables motivated by our analysis of additional audiences (potential litigants and union organizers) and 2) variables suggested by previous research (which has focused on the more limited choice between independent ownership and branded/chain affiliation).

3.1 Audiences in Addition to Customers

Potential Litigants

Prior to 1996, there were relatively few liability claims filed against nursing homes and homes could obtain liability insurance at relatively low and stable rates. Over the next decade, there was a significant growth in lawsuits alleging patient abuse and negligence and liability insurance premiums increased significantly. According to an American Health Care Association study, the average loss from settlements and judgments in this industry accelerated about 26 percent annually from 1996 to 2000 (Burwell, et. al, 2006). The growth in litigation, however, varied substantially across states, depending on the existence and strength of the state's "patient right laws" (Johnson,

et. al., 2004a; Schaefer et al., 2006). Florida, which was widely acknowledged as having the most extreme law at that time, witnessed the greatest increase in litigation and liability insurance costs. In 2001, Florida nursing homes made estimated total compensation payments of $1.1 billion to plaintiffs (Stevenson and Studdert, 2003). Texas is frequently cited as having had the second most litigious environment during this time period. In Texas the frequency of liability claims in 2001-2002 was two to three times the national average, and average settlements were in the range of $300,000 to $500,000 (Burwell, et al., 2006). In 1997, a Texas jury in a awarded the plaintiff $83 million in a wrongful death case against Beverly Enterprises, including $70 million in punitive damages. Primary liability insurance companies stopped selling insurance in both Florida and Texas by the early 2000s.

Theoretically, high legal liability might either help to support or to subvert the use of branded chain ownership as a mechanism for bonding/signaling quality.[13] Multi-unit ownership increases the value of potential legal liabilities due to a coinsurance effect (Galai and Masulis, 1976). The higher expected payoffs provide differential incentives for plaintiffs to file lawsuits against large chains (*ceteris paribus*).[14] The consequences of increased legal liability, however, depend on whether the large chain can limit litigation through diligent performance. If so, the increased legal liability could reinforce the credibility of the brand to customers, since the firm bears an additional potential cost if it cheats and provides low quality. On the other hand, increased threats of "frivolous" lawsuits (claims with doubtful legal merit that are filed to extract settlements from "deep pocketed" defendants) or uncontrollable litigation are likely to reduce the value of large chain ownership relative to independent and small chain ownership. Furthermore, to the extent that

[13]The underlying economic intuition of our subsequent discussion is similar in spirit to Farrell and Gibbons (1989).
[14]While all operators experienced an increase in litigation during this period, large multi-regional chains were sued at a higher rate than small chain and independent operators (Burwell, et al., 2006).

large chains own homes in these high-litigation environments (e.g., due significant supply-side, multi-establishment economies), they arguably would be less likely to brand them. Consistent with this possibility, Attorney J. Rosenfeld (2009) asserts, "Large nursing home operators carefully name or rename facilities with the intent of shielding the parent company from possible liability."

Following Johnson et al., (2004b), we classify homes located in Florida, Texas, Arkansas, California and Georgia as being in "high litigation" legal environments. We classify homes in other states as being in "low-litigation" legal environments. Our results are robust to defining only Florida and Texas as high litigation states. Our tests focus on whether the legal environment affects the ownership and branding of units.

While the effects of these laws are theoretically ambiguous, we expect that the large growth in the frequency and size of lawsuits beginning in the later 1990s would have reduced the incidence of branded chain ownership in the high litigation states (since much of the litigation was potentially beyond a firm's direct control). Indeed, major liability insurance companies and at least some large nursing home chains had decided by 2001 to exit Florida and other highly litigious states. For example, Beverly Enterprises stated in their 2001 Annual Report (filed March 30, 2001) that due to "increasingly expensive and unpredictable patient care liability suits" it was "exploring strategic alternatives for our nursing homes in Florida." In 2003, Beverly divested 73 facilities that generated unusually high malpractice expenses (Stevenson, Grabowski and Coots. 2006).

Florida adopted "tort reform" legislation in 2001 mandating that all nursing homes have professional liability insurance as of January 1, 2002. However, there was no minimum requirement for coverage. Many independently and small chain owned homes purchased finite policies with extremely low limits (e.g., $25,000 per claim). Large chains were largely self-insured and did not benefit from low policy limits, thus making them relatively more attractive as a target

for lawsuits. According to Schaefer et al. (2006) this differential is another reason why "large nursing home chains were leaving Florida altogether."[15]

Unions

The Service Employees International Union (SEIU), with approximately 2.1 million members, is the largest and most rapidly growing labor union in the AFL-CIO. The SEIU represents over 1.2 million members employed in the healthcare sector (including employees from the nursing home industry). Since the early 1980s, the SEIU has focused its organizing efforts at senior management of large firms (rather than employees at individual worksites). Through "corporate campaigns," the union "aggressively attacks the reputations of the targeted firms, undermining public confidence and key stakeholder relationships until management decides to yield to the union's demands or risk the company's financial well being" (Ohio Hospital Association, 2006).[16] Union demands typically include a neutrality agreement (management agreeing not to resist union organizing efforts), a card-check (in lieu of a certifying election) and a "master agreement" (in lieu of separate collective bargaining agreements at individual workplaces). In these campaigns, the union often partners with liberal activist groups that pressure the firm on various social issues. The SEIU began using corporate campaigns in 1983 when it targeted the

[15] Texas enacted tort reform in 2003 that was "generally viewed by both providers and insurers as the legislation with the greatest chance of reducing liability costs." However, liability insurance companies had not returned to the state to any great extent as of June 2006, apparently due the high likelihood that the law would be challenged in the courts (Burwell, et al., 2006, p. 19).

[16] Targeted stakeholders include customers, suppliers, media/public, banks/creditors, employees, institutional investors, boards of directors, regulators and community leaders (for nursing homes physicians, social service counselors and other parties than influence patient selection of a nursing homes are viewed as particularly important). Union campaigns employ, among other techniques, print ads, radio, television, billboards, "frivolous" lawsuits, web sites, encouragement of ministers to give sermons that are critical of the company, banners from planes, and letters to prospective customers (U.S Chamber of Commerce, 2005). THE SEIU has been the most active union in conducting corporate campaigns and in 1988 published a *Contract Campaign Manual* on how to conduct these campaigns. Other major service unions have either used or have the potential to use corporate campaigns (Ohio Hospital Association, 2006).

large nursing home chain, Beverly Enterprises (Osorio, 2002). From 2002 to 2007 the SEIU conducted a corporate campaign against another nursing home chain, the Ensign Group.

Publicly traded nursing home chains commonly include the threat of increased unionization (higher labor costs and potential for work stoppages), as well as prospective pro-union laws, among their risk factors in annual 10-K statements. For example, Ensign discusses in its 2009 Annual Report its concerns about how union campaigns could adversely affect 1) its relationships with important stakeholders, (including physicians and insurance companies) and 2) its ability to attract patients and qualified staff. Branded chains potentially face the greatest risk of a corporate campaign, since it is less expensive for a union to target a company with an identifiable brand name than a company with a portfolio of homes that are not linked by a common name (even assuming that the union has identified the homes' owners, which is not always easy to do).

This discussion suggests that large chains are less likely to own and brand nursing homes that are located in pro-union legal environments.[17] Our empirical tests of this hypothesis employ a dummy variable = 1 if the state has a Right to Work law (RTW) as a proxy for the legal environment related to unions. This choice is based on the plausible argument that a large chain can reduce the likelihood of facing a corporate campaign by concentrating its homes in states with RTW laws and by not branding the homes they own in the states without these laws (the more pro-union states).[18] Our robustness checks consider an alternative measure of unionization – the percent of employees that are covered by union agreements.

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[17]Conceptually, unionization might benefit a firm (e.g., by improving employee relations and reducing communications costs between management and employees). The actions and SEC filings of nursing home chains indicate that they generally view the costs of unions (increased wages, work rules and stoppages, etc.) as higher than the potential benefits.

[18]There were 22 states with RTW laws in 2004. Union membership is substantially lower in states with RTW laws. Holmes (2000) provides evidence that RTW laws are positively associated with manufacturing employment (controlling for a broad array of factors, including geography and climate). There is debate about whether these laws have a direct effect on union membership or whether the association is due to the laws being correlated with general attitudes about labor unions across states (Hirsch, 1980). For our purposes, this distinction is relatively unimportant, as long as the law

3. 2 Variables Suggested by Previous Studies

Previous studies provide evidence that the ownership and branding of service establishments varies with the income and population of the market area and possibly with outlet-level investment requirements. We include related variables in our analysis for two reasons. First, they serve as important controls in considering the effects of litigation and union laws. Second, they are interesting in their own right. Existing evidence is based on a few selected service industries (e.g., motels, service stations and banks) and is limited to the choice between chain affiliation and independent ownership. We examine whether these same variables affect the branding of outlets within large chains and whether the findings in previous studies extend to another important industry – nursing homes.

Branding to Signal/Bond Quality

Existing theory and evidence suggests that branded ownership/affiliation is most likely in environments where customers demand high quality, but are unable to obtain good information on product quality from other sources.[19] Independent ownership, in turn, is more likely in environments where customers can obtain good information about product quality from alternative sources and in low-income areas, where quality tends to be less highly valued.

Similar to Mazzeo (2004) and Png and Reitman (1995), we assume that average household income in the surrounding market is positively correlated with the willingness to pay for high quality services.[20] In 2001, the Federal Government launched a website that provides information

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is negatively correlated with the likelihood of a corporate campaign (this is particularly likely to be true if the laws reflect general attitudes about unions).

[19]A relatively large body of theoretical research has been produced on this general topic, since Klein and Leffler (1981). See Bar-Isaac and Tadelis (2008) for a review of this literature. Empirical evidence on this topic is more limited (see footnote 2). Also relevant is the literature on umbrella branding (see footnote 4).

[20]The assumption that prospective patients in high income will demand and receive high quality services is supported by the significantly positive correlation between standard nursing home quality measures (including deficiency citations and nurse/patient staffing ratio) and average income in the zip code found for our sample.

on quality for each nursing home throughout the United States. Nursing home services, however, are largely experience goods for which quality is difficult to observe prior to purchase. Furthermore, there are potential moral hazard problems after a patient moves in. The "Branding Hypothesis" predicts that homes located in higher income areas are more likely to be branded (to bond or signal that the prospective patient will receive higher quality services).

Population Concentration

Previous studies provide evidence that independent ownership of service establishments is more likely in less populated, more rural areas (Brickley, et al., 2003). Two possible explanations have been offered. The first focuses on the incentives and decision rights of local managers. It is costly to monitor employee-managers at remote locations, and combining ownership and management is potentially a cost-effective way to reduce agency problems at these units. Local managers might also optimally have greater decision rights in more remote, small population markets (given the importance of local knowledge and distance from various specialists located in larger markets). According to this line of reasoning, ownership and significant decision rights are complements (Fama and Jensen, 1983 and Holmstrom and Milgrom, 1994). The second explanation focuses on the fact that more populated markets usually contain a large number of similar establishments, allowing chains to own multiple units in the same market area. Supply side economies are presumably greater when the units within a chain are relatively close together.[21] Employee/managers are also more easily monitored when units are geographically clustered (Brickley, et. al., 2003 and Lu and Wedig, 2011).

[21]Potential multiunit scale economies have long been recognized in the industrial organization literature (Scherer, 1975). Potential scale economies in nursing homes derive from sharing various centralized functions (e.g., legal, finance, accounting, purchasing, compliance and information systems) and standardized operating policies. Some of these economies (e.g., purchasing) are arguably higher if the units are clustered geographically. Chains do not have to brand units to achieve these economies, thus providing a rationale for unbranded chain units. The value of brand names might also tend to be higher when units are clustered geographically.

We employ the natural logarithm of the population of the zip code as our primary measure of population in the local market area (2000 Census). Our robustness checks consider a broader measure of the population, consisting of a dummy variable equal to 1 if the home is located in a Metropolitan Statistical Area (MSA). The "Population Hypothesis" predicts that homes are more likely to be branded in more populated areas.

Investment Financing

Economists have long argued that large corporations have an advantage over small independent firms in raising capital, since their scale allows them to use public capital markets to sell claims to diversified investors with limited liability.[22] Consistent with this contention, there is some evidence that chain ownership is more likely in industries with significant per-unit capital requirements, such as hotels (Brickley and Dark, 1983).

Nursing homes in close proximity to hospitals are well situated to attract Medicare patients. As previously discussed, owners often invest substantial funds in these homes to attract these high-margin patients.[23] Also, throughout the 1990s and continuing until at least 2005, there was a continued decline in the number and proportion of nursing homes that were owned by hospitals. Buyers had to raise sufficient capital to purchase these homes. The capital-raising arguments therefore suggest that the likelihood of large chain ownership is higher if the home is located near a hospital ("Investment Financing Hypothesis"). A complementary factor reinforcing this prediction is the chains are likely to develop knowledge, skills, and resources in serving Medicare patients and dealing with Federal regulations that can be leveraged at other locations.

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[22]See Archer and Faerber (1966), Fama and Jensen (1983), Hansmann (1996) and Scherer and Ross (1990).

[23]Rehabilitation patients often require capital-intensive therapies and value privacy and high levels of service. Doctors' decisions to recommend a nursing home are also influenced by the facility. For example, when the Manor Care chain wanted "to expand the number of its short-term Medicare and insurance patients" at the Devon Manor in Pennsylvania in 2007, it converted about 4,000 square feet into a medical office for local orthopedic surgeons with office space, eight exam rooms, a casting suite and an x-ray suite. It created private rooms with private baths for patients and a separate fully equipped orthopedic rehabilitation gym. The increase in patients after the unit was opened motivated the company to expand from 24 to 40 beds. (Manor Care, "Quality Report," 2009)

We define a home as being "near " a hospital if a short-term acute care hospital is located in the same zip code. We obtain information on the locations of hospitals in the United States from the 2000 American Health Association (AHA) Annual Survey.

3.3 Descriptive Statistics

Table 3 presents the means of our explanatory variables, classified by branded chain, independent and unbranded chains units. The table also presents difference in means tests for independent versus branded units and unbranded versus branded units. Almost all of the bivariate comparisons are highly significant and consistent in sign with our expectations. The one exception is that the proportion of branded homes that are located in Right-to-Work States is the same as for the unbranded chains units (42 percent in both cases). Our arguments about the effects of union laws, however, focus on large chains, which are most likely to be targeted in corporate campaigns. Evidence on whether the laws affect the choice between unbranded and branded large chain ownership is provided below.

4. EMPIRICAL RESULTS

The section proceeds in the following manner. We begin by estimating three models that move sequentially from simple to more refined classifications of homes by ownership/branding type. The first focuses on the simple distinction between chain and independent units. The second divides the chain-owned homes into branded and unbranded. The third makes the additional distinction between large and small chains. After the presentation of our basic results, we discuss the economic magnitude of our estimates (marginal effects) and summarize robustness checks that

we conducted due to various econometric, sample and variable choice concerns. Finally, we consider an alternative, non-efficiency based, explanation for our findings – market power.

4.1 Independent, Branded Chain and Unbranded Chain Ownership

Table 4 reports the estimations of two probit models.[24] The dependent variable in Model 1 is a dummy variable equal to one if the unit is independently owned. Model 2 is a multinomial probit model, where the dependent variable takes on three values, representing whether the home is an independently owned unit (IO), a branded chain unit (BC) or an unbranded chain unit (UC). The explanatory variables are the demographic and regulatory variables discussed above. Model 1 is included primarily for completeness. We focus the discussion in this section on Model 2, which provides more direct tests of our hypotheses.

Multi-Audience Hypothesis 1 (Litigants). We expect that large chains will be less likely to own and brand homes in high litigation states. The Model 2 estimates are consistent with the second part of this hypothesis. In particular, the odds of being either an IO or UC are significantly higher in the litigious states compared to being a BC (p-values < .01). In contrast to the hypothesis, however, the odds of being an UC compared to IO are higher in the litigious states. The combined results suggest that while branding is less common in the high litigation states, chain ownership is not (below we provide further evidence on the litigation hypothesis by partitioning the chains into large and small).

Multi-Audience Hypothesis 2 (Unions). The Model 2 estimates are highly consistent with our hypothesis that Right-to-Work (RTW) laws will be associated with increased chain ownership and branding. The odds of being a BC are higher in these states, compared to both IO and UC. In

[24] This analysis treats each home as an independent observation. Our subsequent robustness checks consider geographic clustering and estimations based on subsamples of homes located in restricted entry/construction states (where our exogeneity assumption is most likely to hold).

addition, the odds of being a UC are higher in RTW states compared to IO. All of these results are highly significant with p-values of < .01. These combined results suggest that both chain ownership and the branding of homes are less common in pro-union environments.

Branding Hypothesis. The estimates in Model 2 also provide strong support for the Branding Hypothesis, which predicts that the incidence of branding will increase with income of the market area. The odds of being either an IO or UC fall relative to being a BC as income increases. Both results are highly significant with p-values < .01. These findings contribute to the existing literature that suggests that brands are an important mechanism for bonding or signaling quality to customers.

Population Hypothesis. The Population Hypothesis predicts that the odds of being an IO will decrease with the population of the market area. The Model 2 results provide mixed evidence on this hypothesis. While the odds of being an IO fall compared to BC as population increases, there is no significant change in the odds of being an IO compared to UC. Furthermore, the estimates in Model 1 indicate that population does not affect the odds of chain ownership compared to IO significantly.

The Model 2 estimates also indicate that there is a significant decrease in the odds of being an UC compared to BC as population increases. This finding, as well as the comparison between BC and IO, suggests that brand names are potentially more valuable in more populated areas. One potential explanation is that larger markets have more transitory populations and less "word of mouth." For example, a rural family with a relative in the only nursing home in town has knowledge about the entire market, while a typical family with a relative in a home in a large urban area does not.

Investment Financing Hypothesis. Finally, the evidence in Table 4 is consistent with the Investment Financing Hypothesis. The presence of a nearby hospital (which we argue is associated with relatively large investments to acquire, remodel and equip the homes to make attract Medicare patients) is associated with a decline in the odds of being an IO unit. This finding supports the contention that corporations have a comparative advantage in raising large amounts of capital. Another non-mutually exclusive explanation for this finding is that chains are more likely to own homes that serve Medicare patients because they can leverage experience and knowledge in serving these patients and dealing with Federal regulations.

4.2 Effects of Chain Size

Table 4 is based on a simple classification of homes as either independent or chain-owned. Large national or regional chains, however, potentially differ in important ways from small local chains, owning as few as two homes. For example, large chains are likely to have the greatest potential advantages in raising capital for investment and the greatest threat of litigation and unionization. This section extends the analysis by differentiating between large and small chains.

Table 5 presents the estimation of a multinomial probit model with four ownership/branding classifications: independent ownership (IO), small chain ownership (SC), branded ownership by a large chain (BLC) and unbranded ownership by a large chain (ULC).[25] For empirical purposes, we characterize chains owning ten or more units as large and others as small (our sensitivity checks examine other cutoffs). All of the columns in the table report results from the same model. The

25We do not differentiate between branded and unbranded small chain units, since branding is less prevalent among small chains and a five-category model would complicate the presentation of the results (21% (330) of small chain units are branded). Our discussion in the text treats all small chain units as being unbranded (or having a relatively weak brand name). We have estimated models where have divided small chains into branded and unbranded. The inferences from these models are qualitatively the same as for the less complicated model reported in the text. The additional estimates are available from the authors on request.

first three columns show pair-wise comparisons using BLC as the base comparison category. The remaining columns report additional comparisons using other types as the base category.

The Model 3 estimates largely reinforce the conclusions drawn from Model 2. Both models are consistent with the hypothesis that branding is less common in litigious states. In contrast to our expectations, however, the odds of being either an ULC or SC compared to IO are significantly higher in the litigious states. The evidence from both models provides strong support for the hypothesis that RTW laws are associated with increased chain ownership and branding. Both models also provide strong support for the Branding Hypothesis (which predicts a positive association between branding and income) and mixed support for the Population Hypothesis (which predicts that the odds of IO will decrease as with increases in the population of the market area). The odds of BLC increase with population (compared to IO, ULC or SC), but population is not associated with the odds of chain ownership in general. Finally, both models provide general support for the Investment Financing Hypothesis (the ULC versus SC comparison in Model 3 has the predicted sign, but is not significant; the other results are significant at conventional levels).

Arguably, the most important new findings in Tables 4 and 5 are those relating to the effects of litigation and union laws. Our evidence provides strong support for the hypotheses that both labor unions and potential litigants affect the ownership and branding of nursing homes. Of particular interest is the finding that the odds of being a branded versus unbranded chain unit are affected by these multiple audience concerns. Neither the effects of non-customer audiences on ownership and branding nor the observation that chains sometimes choose not to brand all of their outlets have been considered in previous studies.

4.3 Marginal Effects

Probit model coefficients are difficult to interpret because they measure the change in an unobservable latent variable associated with a change in an explanatory variable. To assess the economic magnitude of the estimated coefficients, we calculate marginal effects at the means of the explanatory variables. Given that our most significant findings relate to branding, we focus here on the effects of changes in explanatory variables on the probability of being a branded chain unit (BC). The estimated probability of BC is 18.8 percent at the means for the variables using Model 2 for 2004. Changing to a RTW state increases the probability by 5.0 percent, while changing from a low to high litigation state decreases the probability by 7.0 percent. Two standard deviation changes in the natural logarithms of income and population increase the likelihood of BC by 4.0 percent and 4.2 percent, respectively. Changing to a zip code with a hospital increases the probability by 2.3 percent.

4.4 Robustness Checks

Our empirical analysis relies on various econometric assumptions. We also made discretionary choices in selecting the sample and our explanatory variables. We conducted numerous sensitivity checks to gauge the robustness of our results. This analysis reveals that our results are highly robust. This section briefly discusses the most important checks. Tables containing the primary sensitivity checks can be obtained from the authors by request.

Sample. Our empirical analysis is based on the econometric assumption that the location of homes is predetermined relative to the ownership and branding decisions. We re-estimated our basic model using the subsample of homes located in states that restricted entry and construction of new homes during our sample period (where our underlying assumption is arguably most likely to hold). The results are highly consistent with those for the full sample.

Our reported analysis includes all for-profit nursing homes, including 179 homes owned by hospitals. This raises the concern that the significance of the hospital dummy variable could reflect hospitals owning their own nursing homes. However, estimating our model with the subsample that excludes the hospital-owned homes produces very similar results to those for the full sample (the probability of chain ownership is still relatively higher near hospitals)

Clustering. Our empirical analysis treats each home as an independent observation. Errors are assumed to be homoscedastic, independent and identically distributed. Geographic clustering of homes could cause these assumptions to be invalid. The error terms for homes clustered at the zip code, county and/or state level are potentially correlated (unobserved variables might jointly affect the ownership and branding decisions of the homes in a cluster). We are particularly concerned about clustering at the zip code level, since there is no variation in the explanatory variables for homes located in the same zip code. Our calculation of clustered standard errors revealed the following. All of our results are highly robust to clustering at the zip code and county levels. With state-level clustering, we find that all our results are robust with the following exception. The union dummy loses its significance when comparing unbranded with branded chain units.

Variable Definitions. In defining the explanatory variables, we made choices that could affect our results. We redid the analysis using alternative definitions of various variables. In each case, our reported findings continue to hold. Some of the most important checks include the following. As an alternative to the classification proposed by Johnson et al., (2004b) for high-litigation states, we define only Florida and Texas as high litigation states. Second, we employed the percentage of employees in the state that were covered by union contracts in 2001 (from the Union Membership and Coverage Database, http://unionstats.com/), as an alternative to the RTW dummy variable. Third, population in the broader market area of a nursing home is potentially more

important than the population in the zip code for ownership and branding decisions. As an alternative, we employed a dummy equal to one if the home is in a MSA. Finally, we arbitrarily defined a large chain as one that owned ten or more homes. As an alternative, we used 5, 15, or 20 homes.

More Controls. We concern that we might omit some important control variables that may change our results. One possible omitted variable is quality of nursing service in each state. Worse quality may result in more law suits and less branded homes. We did not add it into our main model because our main litigation measure is defined according to the existence and strength of the state's "patient right laws", which is independent of nursing home quality in each state (Johnson, et. al., 2004a; Schaefer et al., 2006). There is no significant correlation between litigation status and quality of nursing homes in each state. The other potential omitted one is the size of each nursing home. The investment financing argument suggests that large beds should be associated with chain ownership. However, treating the number of beds as exogenous may raise some reverse causality concerns. In robustness checks, we added state average deficiency citations (or average staffing ratio) as a measure of quality and the number of beds into our model. Overall, our results remain robust.

4.5 Alternative Explanation – Market Power

The existing literature on the branding and ownership of service establishments has focused on efficiency-based arguments (efficient solutions to asymmetric information problems, etc.). Some of our hypotheses are motivated by this literature. Horizontal structures, however, can also be motivated by attempts to create and exploit market power. Nursing home markets are primarily local, and it is plausible that state restrictions on entry, local zoning and licensing requirements, and

endogenous sunk expenditures on marketing and advertising (Sutton, 1991) could shield local monopolies from competition. A natural question to ask is whether the market power perspective can explain our findings. We think that the answer is no for two reason. First, market power does not appear to be an important issue in the nursing home industry. Second, market power does not obviously predict our findings.

Is Monopoly Power an Important Concern? Various characteristics of the industry suggest that nursing homes generally have little market power. First, the typical nursing home receives about 75 percent of its revenues from Medicare and Medicaid at fixed prices. A nursing home with a monopoly power could lower quality and costs for serving these patients, but would run the risk of the government terminating their participation in these programs (a devastating outcome for most homes). Second, nursing homes compete with a variety of substitute providers that limit market power, including hospitals, extended care centers, assisted living facilities, home health agencies, nonprofit nursing homes, and informal caregivers. Third, our reading of SEC disclosures of nursing home chains, as well as a review of antitrust litigation in this industry, suggests that antitrust is not an important concern in this industry.

Existing empirical work also suggests that market power is low in this industry. The greatest potential for creating and exploiting market power in the nursing home industry is in the market for private payers where firms compete on price. Nyman (1994), however, presents at best very weak evidence that some nursing homes had market power in the private payer market in Wisconsin (CON-law state) in 1988.[26] Many states restrict entry of nursing homes, which has the potential to foster market power. Various researchers have studied this empirically, and the overall effect appears small. Santerre and Neun (2009) survey this literature and conclude that the typical

[26]Two of his six empirical specifications reveal a positive association between the Lerner Index and HHI for the county that is significant only at the ten percent level. The association is found to be insignificant in other specifications.

nursing home "probably has very little control over prices since it faces the countervailing pressure of the government and highly price elastic demand of private buyers."

Market Power Predictions. Many of our results are not obviously predicted by the market power alternative. This alternative does suggest that chains would want to monopolize high-income areas (where private payers tend to be located), but it is unclear why they would want to brand their homes in these areas. In fact, under the monopoly alternative, they could have an incentive not to highlight that they own the homes to reduce the likelihood of antitrust actions or litigation. The monopoly alternative also does not make clear predictions concerning the effects of either population or proximity to a hospital. The effects that population has on the costs and benefits of monopolization are ambiguous, and the Medicare patients that are served at homes near hospitals face prices set by the government.

In the case of our main hypothesis *Audience Hypothesis*, it does not matter for our purposes whether the homes have market power or not. Our interpretation of the evidence is the same in either case – chains appear to have relatively strong incentives to avoid owning and branding homes in the high litigation and pro-union states.

To provide evidence that our results are not driven by market power, we estimate Models 2 and 3 restricting our sample to nursing homes in counties with local Herfandahl index lower than 2,500.[27] As shown in Table 6, all our primary findings continue to hold (both for the multi-audience hypotheses and those drawn from the existing literature). Similar results are also found when we exclude nursing homes in markets with HHI higher than 1,500.

Efficiency and monopoly power are not mutually exclusive and both could have some affect on the structure of this industry. However, for the reasons discussed in this section, we conclude

[27]Federal Trade Commission classifies markets into three types: unconcentrated markets (HHI<1,500), moderately concentrated markets (1500≤HHI≤2500), highly concentrated markets (HHI>2,500) . See 2010 "Horizontal Merger Guideline", page 19.

that market power is unlikely to explain much of the variation in the horizontal structure of this industry and our results are best interpreted from an efficiency-based perspective.

5. CONCLUSION

This paper employs a large sample of for-profit nursing homes to provide new evidence on the ownership and branding of outlets in service industries. It extends the existing literature by considering a broader set of organizational choices (branded and unbranded large chain ownership, small chain ownership and single unit ownership) and by considering audiences in addition to customers that might affect the ownership and branding of establishments. The study also provides new evidence on several hypotheses that have been tested in the existing literature using data from a few other specific industries and contributes more generally to the literatures on multi-product firms and business names.

Our empirical tests provide strong and robust support for the hypothesis that audiences in addition to customers affect both the ownership and branding of nursing homes. In particular, we find that 1) chains are relatively less likely to brand homes in states with laws that promote either unionization or patient liability lawsuits and 2) the likelihood of chain ownership (relative to independent ownership) is lower in states with pro-union legal environments. Our evidence is also consistent with hypotheses contained in the existing literature concerning the role of brand names in bonding/signaling quality to customers and the comparative advantages that larger corporations have in raising investment capital.

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Figure 1: Distribution of Chain Size

The sample contains of 580 nursing home "chains," which operate at least two homes as of Dec 2004. This figure displays the distribution of these firms by chain size (single unit firms are not included). The sample average, median and standard deviation of chain size are 11, 4 and 29 homes, respectively.

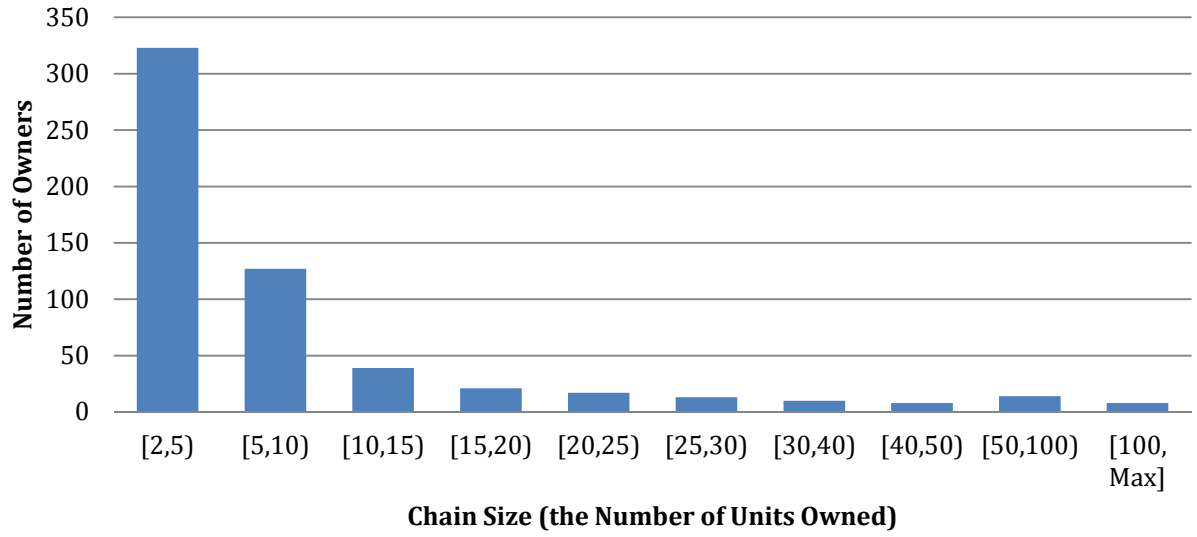

Table 1: Distribution of Branding Strategies

This table reports the distribution of branding policies for the 580 chains in our sample as of December 31, 2004.

	For-profits Nursing Home Chains							
	All Chain Owners				Large Chain Owners (more than 10 units)			
	Owners	Percent	Units	Percent	Owners	Percent	Units	Percent
Brand on All Units	76	13.1	383	5.9	8	6.2	170	3.5
Brand No Units	381	65.7	2,469	38.0	53	41.1	1,353	27.8
Mixed Branding Strategy	123	21.2	3,638	56.1	68	52.7	3,340	68.7
Total	580	100	6,490	100	129	100	4,863	100

Table 2: Branding Strategy and Location Choices in Top Ten Nursing Home Chains

This table lists the ten largest chains among the 580 chains in our sample, along with their number of branded and unbranded units and states of operation as of December 31, 2004.

Chain Owner	Branded Units	Unbranded Units	Total	% of Branded Units	Market Share (%)	States Covered
BEVERLY	166	188	354	46.9	3.5	25
MANOR CARE	266	36	302	88.1	2.9	10
KINDRED	20	237	257	7.8	2.5	14
MARINER HEALTH	75	151	226	33.2	2.2	30
GENESIS	22	136	158	13.9	1.5	28
LIFE CARE RETIREMENT	96	59	155	61.9	1.5	33
TRANS HEALTHCARE	8	129	137	5.8	1.3	22
EXTENDICARE	28	105	133	21.1	1.3	15
SUN HEALTHCARE	71	25	96	74.0	0.9	17
UHS-PRUITT	0	82	82	0.0	0.8	6
Total	732	1,168	1,900	38.5	18.5	50

Table 3: Relationship between Ownership/Branding Types and Explanatory Variables

This table shows the means of these explanatory variables across ownership/branding types. We also calculate the differences in means using the branded units as the base category. The p-value is obtained by regressing an explanatory variable over a constant and the ownership/branding type dummies. Almost all the results are consistent with our hypotheses. The sample consists of 10,249 profit-maximizing nursing homes as of Dec, 2004 in the Online Survey, Certification and Reporting (OSCAR) database (includes nursing homes that were not inspected in 2004 but had inspection records in 2003 and 2005).

	Branded Units	Independent Owned	Unbranded Units	Independent Owned vs. Branded Units		Unbranded Units vs. Branded Units	
	Mean			Difference	P-value	Difference	P-value
Audience Hypothesis							
High Litigation States	0.20	0.23	0.28	0.03	[0.003]	0.08	[0.000]
States with the Right-to-Work Law	0.42	0.36	0.42	-0.06	[0.000]	0.00	[0.977]
Branding Hypothesis							
Log Household Income	10.60	10.57	10.55	-0.02	[0.008]	-0.04	[0.000]
Population Hypothesis							
Log Population	9.87	9.75	9.75	-0.12	[0.000]	-0.11	[0.000]
Investment Financing Hypothesis							
Is There a Hospital Nearby?	0.57	0.48	0.54	-0.09	[0.000]	-0.02	[0.066]

Table 4: Determinants of Ownership/Branding Types

This table reports estimated probit models predicting ownership/branding type as a function of the market, regulatory and information environment of the home. Model I is bivariate with a dependent variable equal to 1 if the nursing home is operated independently. Model 2 is multinomial. The dependent has three possible values, representing independent ownership (IO), branded chain ownership (BC) and unbranded chain ownership (UC). The results in the first two columns for Model 2 are for the estimation where BC is the base category. The third column reports the same model estimated with UC as the base category. The sample consists of 10,249 profit-maximizing nursing homes as of Dec, 2004 in the Online Survey, Certification and Reporting (OSCAR) database (includes nursing homes that were not inspected in 2004 but had inspection records in 2003 and 2005).

	Model 1	Model 2		
	IO vs. Chain	IO vs. BC	UC vs. BC	IO vs. UC
	(1)	(2)	(3)	(4)
Constant	0.808*	5.014***	5.186***	-0.171
	(0.445)	(0.736)	(0.727)	(0.642)
Audience Hypotheses				
High Litigation States	-0.018	0.267***	0.432***	-0.165***
	(0.032)	(0.053)	(0.051)	(0.045)
States with the Right-to-Work Law	-0.164***	-0.320***	-0.163***	-0.157***
	(0.029)	(0.046)	(0.045)	(0.041)
Branding Hypothesis				
Log Household Income	-0.083*	-0.318***	-0.318***	-0.001
	(0.043)	(0.070)	(0.070)	(0.062)
Population Hypothesis				
Log Population	-0.012	-0.097***	-0.121***	0.024
	(0.015)	(0.025)	(0.025)	(0.022)
Investment Financing Hypothesis				
Is There a Hospital Nearby?	-0.173***	-0.259***	-0.051	-0.208***
	(0.027)	(0.045)	(0.044)	(0.039)
LR Chi2	90.6		204.5	
Observations	10,249		10,249	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Determinants of Ownership/Branding Types: Differentiation between Small and Large Chains

This table reports an estimated multinomial probit model where the dependent variable has four possible values, representing independent-ownership (IO), small chain ownership (SC), branded large chain ownership (BLC), and unbranded large chain ownership (ULC). A small chain is defined as a chain with fewer than 10 units. Explanatory variables include market, regulatory and information characteristics of the home. The results reported in column (1)-(3) are for the estimation where BLC is the base category. The other columns report the same model using other categories as the base. The sample consists of 10,249 profit-maximizing nursing homes as of Dec, 2004 in the Online Survey, Certification and Reporting (OSCAR) database (includes nursing homes that were not inspected in 2004 but had inspection records in 2003 and 2005).

Model 3	(1)	(2)	(3)	(4)	(5)	(6)
Comparison Pairs	IO vs. BLC	ULC vs. BLC	SC vs. BLC	ULC vs. IO	SC vs. IO	ULC vs. SC
Constant	5.209***	4.487***	4.674***	-0.722	-0.535	-0.187
	(0.758)	(0.771)	(0.843)	(0.662)	(0.746)	(0.759)
Audience Hypothesis						
High Litigation States	0.375***	0.507***	0.561***	0.132***	0.186***	-0.054
	(0.055)	(0.055)	(0.060)	(0.046)	(0.052)	(0.052)
States with the Right-to-Work Law	-0.363***	-0.205***	-0.240***	0.158***	0.123***	0.035
	(0.047)	(0.048)	(0.052)	(0.042)	(0.048)	(0.048)
Branding Hypothesis						
Log Household Income	-0.315***	-0.263***	-0.322***	0.052	-0.007	0.059
	(0.072)	(0.074)	(0.081)	(0.064)	(0.072)	(0.073)
Population Hypothesis						
Log Population	-0.106***	-0.121***	-0.125***	-0.015	-0.019	0.004
	(0.026)	(0.027)	(0.029)	(0.022)	(0.025)	(0.026)
Investment Financing Hypothesis						
Is There a Hospital Nearby?	-0.276***	-0.057	-0.120**	0.219***	0.156***	0.063
	(0.046)	(0.047)	(0.051)	(0.041)	(0.046)	(0.046)
LR Chi2	241.83					
Observations	10,249					

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Tests for Rejecting Alternative Hypothesis: Market Power

This table reports the estimation of our basic models using subsample of homes outside of counties highlighted as "highly concentrated markets". This subsample excludes those nursing homes in markets with local Herfindahl index (HHI) greater than 2500 and consists of 7,135 profit-maximizing nursing homes as of Dec, 2004 in the Online Survey, Certification and Reporting (OSCAR) database (includes nursing homes that were not inspected in 2004 but had inspection records in 2003 and 2005). We also try a subsample excluding nursing homes in markets with HHI greater than 1500. The results remain robust.

HHI Below 2500	Model 2		Model 3		
	IO vs. BC	UC vs. BC	IO vs. BLC	ULC vs. BLC	SC vs. BLC
Constant	6.722***	4.721***	7.041***	3.730***	5.578***
	(0.887)	(0.885)	(0.913)	(0.941)	(1.019)
Audience Hypothesis					
High Litigation States	0.140**	0.290***	0.245***	0.385***	0.413***
	(0.060)	(0.059)	(0.063)	(0.064)	(0.069)
States with the Right-to-Work Law	-0.279***	-0.0798	-0.360***	-0.153**	-0.268***
	(0.058)	(0.057)	(0.059)	(0.060)	(0.066)
Branding Hypothesis					
Log Household Income	-0.452***	-0.324***	-0.473***	-0.263***	-0.443***
	(0.079)	(0.079)	(0.081)	(0.084)	(0.091)
Population Hypothesis					
Log Population	-0.118***	-0.068**	-0.113***	-0.046	-0.081**
	(0.034)	(0.035)	(0.035)	(0.037)	(0.040)
Investment Financing Hypothesis					
Is There a Hospital Nearby?	-0.211***	-0.054	-0.227***	-0.071	-0.094
	(0.053)	(0.052)	(0.055)	(0.056)	(0.061)
LR Chi	116.3		145.32		
Observations	7,135		7,135		

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1: Summary Statistics

The sample consists of 10,249 profit maximizing nursing homes as Dec, 2004 in Online Survey, Certification and Reporting (OSCAR) database (includes nursing homes that were not inspected in 2004 but had inspection records in 2003 and 2005). This table reports the summary statistics for the explanatory variables used in this paper.

Variable	Obs	Mean	SD	Min	Max
Measures of Additional Audiences					
High Litigation States	10249	0.2	0.4	0	1
High Litigation States: TX and FL	10249	0.1	0.3	0	1
States with the Right-to-Work Law	10249	0.4	0.5	0	1
Union Coverage (%)	10249	13.5	5.6	3.8	25.6
Variables Suggested by Existing Literature					
Log Household Income	10249	10.6	0.3	9.0	11.9
Log Population	10249	9.8	0.9	1.6	11.6
Is There a Hospital Nearby?	10249	0.5	0.5	0	1

Table A2: States with CON Law or Construction Moratorium

This table reports the estimation of our basic model using subsamples of homes in states that limited entry and construction of new homes. There are 40 states that had Certificate of Need (CON) laws and/or construction moratoriums in 2004.

CON Law and Moratorium	Model 2		Model 3		
	IO vs. BC	UC vs. BC	IO vs. BLC	ULC vs. BLC	SC vs. BLC
Constant	5.295***	5.683***	5.314***	4.801***	4.630***
	(0.821)	(0.814)	(0.848)	(0.866)	(0.942)
Audience Hypotheses					
High Litigation States	0.232***	0.577***	0.367***	0.687***	0.681***
	(0.073)	(0.070)	(0.076)	(0.076)	(0.082)
States with the Right-to-Work Law	-0.377***	-0.286***	-0.436***	-0.335***	-0.372***
	(0.057)	(0.056)	(0.058)	(0.059)	(0.065)
Branding Hypothesis					
Log Household Income	-0.318***	-0.342***	-0.290***	-0.255***	-0.297***
	(0.079)	(0.079)	(0.082)	(0.084)	(0.091)
Population Hypothesis					
Log Population	-0.118***	-0.140***	-0.134***	-0.155***	-0.138***
	(0.029)	(0.028)	(0.030)	(0.030)	(0.033)
Investment Financing Hypothesis					
Is There a Hospital Nearby?	-0.243***	-0.0426	-0.245***	-0.0459	-0.0626
	(0.051)	(0.050)	(0.052)	(0.053)	(0.058)
LR Chi	208.6		233.6		
Observations	8,133		8,133		

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness Checks with Alternative Audience Measures

The table reports the estimation of our basic models using the alternative measures for additional audiences. The sample consists of 10,249 profit maximizing nursing homes as Dec, 2004 in Online Survey, Certification and Reporting (OSCAR) database.

	Model 3			Model 3		
	IO vs. BLC	ULC vs. BLC	SC vs. BLC	IO vs. BLC	ULC vs. BLC	SC vs. BLC
Audience Hypotheses						
High Litigation States	0.399***	0.464***	0.549***			
	(0.054)	(0.054)	(0.058)			
High Litigation States: TX and FL				0.478***	0.603***	0.597***
				(0.077)	(0.076)	(0.082)
States with the Right-to-Work Law				-0.418***	-0.269***	-0.287***
				(0.051)	(0.051)	(0.056)
Union Coverage (%)	0.052***	0.009**	0.026***			
	(0.004)	(0.004)	(0.005)			
Branding Hypothesis						
Log Household Income	-0.436***	-0.239***	-0.362***	-0.311***	-0.257***	-0.317***
	(0.074)	(0.075)	(0.082)	(0.072)	(0.074)	(0.080)
Population Hypothesis						
Log Population	-0.122***	-0.110***	-0.125***	-0.085***	-0.090***	-0.087***
	(0.026)	(0.027)	(0.029)	(0.026)	(0.026)	(0.028)
Investment Financing Hypothesis						
Is There a Hospital Nearby?	-0.258***	-0.066	-0.118**	-0.276***	-0.057	-0.123**
	(0.046)	(0.047)	(0.051)	(0.046)	(0.047)	(0.051)
LR Chi		389.1			182.3	
Observations		10,249			10,249	

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