

The Commercialization of Nursing Home Care: Does For-Profit Efficiency Mean Lower Quality or do Corporations Provide the Best of Both Worlds?

Will Mitchell

Duke University

Aparna Venkatraman

Duke University

Jane Banaszak-Holl

University of Michigan

Joel Baum

University of Toronto

Whitney Berta

University of Toronto

Key words: Non-profit, chains, nursing homes, service quality and efficiency

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Abstract

This study examines for-profit conversion of the U.S. nursing home sector, focusing on the growth of for-profit chains and the possible decline of independent non-profit facilities. We take advantage of a natural experiment that occurred during the 1990s, in which for-profit chains and non-profit facilities competed in local markets throughout the country. We address a series of questions concerning the relative cost and quality performance of for-profit chains and independent non-profits, including both cross-sectional comparisons and dynamic changes that occur through entry, exit, and change of surviving non-profit organizations. At the core of our study is the question of whether non-profit organizations are increasingly emulating the performance levels of their for-profit competitors or whether they are differentiating within market segments that have higher quality and higher cost. The study tracks several thousand nursing homes for seven years. The results contribute both to a health policy debate and to our conceptual understanding of the strategic characteristics of different organizational forms.

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Two changes in organizational form are becoming increasingly common throughout the U.S. and in many economies around the world. First, for-profit firms are becoming prevalent in traditionally non-profit sectors. Many industries are created by non-profit organizations, only to become part of the for-profit sector as they mature. Sectors as diverse as grain wholesaling, natural food retailing, hospital services, rural food retailing, life insurance, health insurance, semiconductor design, the Internet, consumer deposit banking, and nursing home services began in mutual help societies, church basements, consumer cooperatives, university labs, and government agencies. Once these industries became commercially viable, for-profit corporate entities have increasingly dominated them (Hansmann, 1996b: 294-296.). A second trend is the growing affiliation with chain organizations, especially in the service sector. Chain membership is pervading almost every service industry that sees a direct contact between the customer and the organization, such as food service, hospitality, banking, insurance, amusements, business services, and auto services (Ingram and Baum, 1997). These trends suggest that for-profit chain-affiliates are coming to dominate many service sectors that were once served by independent non-profit organizations.

The entry or conversion to for-profit and chain organizations raises a question that is important to business-owners, consumers, and policy-makers alike. Do efficiency gains compromise quality of services? That is, does for-profit status, chain status, or their combination within the for-profit chain organizational form create a trade-off between cost and quality or, instead, do these organizations provide services that compete with traditional independent non-profit organizations on both cost and quality dimensions?

Three considerations motivate this question – the role of the non-profit sector, reasons for the growing dominance of for-profit status, and reasons for seeking chain affiliation. The non-profit organization is common in new markets where there is high uncertainty about the commercial viability of a product or service, because non-profits allow consumers to obtain goods that would otherwise be unavailable. In addition, non-profits are common in markets involving information asymmetry between producers and consumers. Information asymmetry arises when consumers do not have access to the same extent of information available to sellers, such as when it becomes hard to measure output quality. In such cases, the greater profit-

maximizing motive of the for-profit organization may lead producers to take advantage of the relative ignorance of the consumer in order to enhance profits. For instance, a profit-seeking hospital may provide high quality care on easily monitored dimensions, but cut corners on hard-to-monitor quality measures (Sloan, et al., 2001). Through the elimination of the profit-seeking motive, the non-profit form of organization addresses the issue of trust and may be expected to provide better overall quality of services.¹ Ballou (2002) shows that, to the extent that buyers use ownership type as a proxy for non-verifiable quality, buyers appear to trust and recognize non-profits over for-profits.

Markets that begin as non-profit sectors commonly face increasing pressures from commercial organizations as they mature. In part, this happens when a market's commercial viability becomes evident and for-profit entrepreneurs enter with the promise of lower cost and/or superior service than early entrant non-profits. Moreover, Weisbrod (1988) and Sloan, et al. (2001) note that the non-profit form is superior only to the extent that the increase in valuable behaviors offsets other responses [i.e., problems inherent in non-profit organization] that decrease welfare. Even if they have ongoing advantages, such as when information asymmetry is common, non-profit organizations commonly face problems with regard to effectiveness of internal organization, access to capital, entrepreneurship, response to changing demand, accountability, and more generally, with ownership and control. These problems may challenge the efficient operation of non-profit organizations, where we define efficiency as equivalent to requiring lower cost to provide similar services. A change in ownership status (from non-profit to for-profit) is generally sought to help the non-profit organization cope with changes in product-market conditions (Hansmann, et al., 2002). Further, conversion also occurs when raising capital through sources such as government grants and charitable contributions becomes too difficult or costly. In addition, for-profit status allows organizations to monitor and reward management through easily measurable monetary rewards rather than through non-pecuniary benefits, which may be difficult to standardize and could result in adverse management behaviors. Thus, the for-profit organization can provide incentives to operate at lower cost than the non-profit organization. Hansmann (1996b) argues that an additional reason for heightened efficiency is simply that goals are clearer in for-profit organizations. That is, for-profits work with a simple numerical objective in mind – maximizing return on invested capital – rather than attempting to balance multiple objectives for their consumers and staff.

Chain affiliation is another common trend in the service sector. Ingram and Baum (1997) describe chains as collections of service organizations with similar substantial functions, linked together into a larger organization. An individual organization may find it beneficial to seek chain membership when local market competition becomes severe. As summarized by Baum (1999), chain affiliation standardizes services across chain components, thereby reducing uncertainty regarding the efficiency of services. The reliability enhances the reputation of the chain and its component members. Chains may also achieve economies of scale in operations and management support, which provide individual components with greater market power and better access to resources. Lastly, chains provide their components with multi-market contact with other chains, where competing organizations may be able to enhance their survival by undertaking coordinated efforts rather than aggressive competitive action. Thus, organizations may seek chain membership in order to achieve higher efficiency standards or to reduce competition.

This paper poses two central questions: First, do for-profit and/or chain-affiliated organizations exhibit different quality and efficiency standards than independent non-profit organizations? Or, alternatively, do non-profits tend to emulate their for-profit competitors? Second, how does competition from an increasing proportion of for-profit and chain organizations affect performance and survival of the independent non-profit organization in an industry? Does the quest for efficiency gains suggest disappearance of non-profit organizations and deteriorating quality of services overall? Or, alternatively, might a market bifurcate, such that there is a remaining space for independent non-profits that provide higher quality but perhaps at higher cost than for-profit chains?

Addressing these questions is of interest from both a strategy and policy standpoint. Management scholars are increasingly becoming interested in novel organizational forms as engines of evolution (Baum, 1999), and in the coexistence of multiple organizational forms in mixed industries (Grabowski and Hirth, 2003). Strategy scholars, moreover, have long been interested in the ability of an industry to segment into different combinations of competitors, whether in strategic groups or in individual firms that chose different strategies. From a policy perspective, the challenge is to insure that the evolving institutional changes and pressures towards commercialization do not diminish the unique charitable role of non-profit organizations (Tuckman, 1998).

We examine these questions in the nursing home industry, a sector that has traditionally been dominated by the non-profit form, but has increasingly seen the rise of for-profit chains. We compare and contrast different classes of nursing homes that operated in the U.S. between 1991 and 1997.

The transition from independent non-profit nursing home facilities to for-profit chains has been taking place for more than a century in the U.S. A semi-organized form of nursing home services originated during the 1800s, when so-called 'poorhouses' run by government agencies began to provide services. These poorhouses often catered to the homeless and the infirm as well as the elderly and soon exceeded their capacity to provide care. The early 1900s saw numerous non-profit organizations build homes for the elderly in order to provide a more respectable living for older citizens. These 'benevolent societies' created one of the earliest organized old-age care systems in the U.S. Membership was voluntary and members paid monthly dues in their youth in exchange for physical and financial assistance in their later years. The 1930s and 1940s heralded the entry of the corporate sector in elder care services. The Great Depression saw a decrease in service supply from non-profit organizations, when poor economic conditions limited spending and charitable giving. At the same time, demand rose with increases in life expectancy. Families that had previously looked after their elderly struggled to do so during the Depression. The Federal government intervened and passed the Social Security Act with the intention of providing financial security to the elderly. As a result, recipients were able to pay cash for nursing home services in an era when money was hard to come by, making them attractive clients for a fledgling for-profit nursing home industry. In the 1950s, the Federal Housing Administration began offering low-down-payment loans for nursing home construction, providing an attractive option for commercial real estate developers. Thus, a series of economic events and policy reforms saw the rise of the for-profit organization in a sector formerly dominated by non-profits (<http://www.elderweb.com/history/default.php?PageID=2806>, accessed May 21, 2003).

Nursing home chain affiliation is a more recent phenomenon. The introduction of Medicare and Medicaid as assistance for nursing home care during the late 1970s triggered the rise of nursing home chains (Light, 1986). In addition, progressive cutbacks in federal aid accompanied by state-imposed moratoriums in the number of nursing homes and nursing home beds during the 1980s catalyzed chain affiliation in a bid to seek scale and scope efficiencies and

maintain profits. By 1993, for-profit nursing home chains were the fastest-growing segment in long-term care. For-profit nursing homes chains operated 5,179 of the nation's 15,165 nursing homes, a 47% increase from 1985, and operated 36% of the nation's 1.7 million nursing home beds (from the Nursing Home Market Report and Directory report in Burns, 1993).

Nursing homes are a highly suitable context in which to study changing prevalence and resulting impact of non-profit, for-profit, and chain organizations. The theory of nursing home ownership differences is grounded in information asymmetry and contracting failures. Nursing home residents may be vulnerable to opportunistic behavior due to limited physical and cognitive capabilities and the often urgent nature of care decisions (Hirth, 1999). Monitoring of care may be difficult and residents may not easily be able to evaluate quality and communicate concerns to family members (Grabowski and Hirth, 2003). Further, residents often lack family support to assist them with the decision process (Norton, 2000). In such a situation, the non-profit nursing home that has a lesser incentive to cut quality in order to reduce costs can serve as a signal of quality. Baum (1999) summarizes the argument that non-profit nursing homes are perceived to be ideologically distinct from for-profits and more oriented towards satisfying community needs, without regard for profit.

While for-profit chains have become a common form, non-profits still maintain a presence in the nursing home industry. In the period between 1971 and 1985, the size of the nursing home care industry doubled; non-profit homes not only retained but also expanded their market share over that period, from 18% to 23% (Hansmann, 1996a). We are interested in studying whether that presence has persisted over our study period or whether there is an increasing trend to for-profit dominance. These trends will help us understand the dynamics of competition between for-profit and non-profit organizations. Moreover, understanding changes in efficiency and quality in the nursing home sector is intrinsically important, because the changes affect so many members of the population, including residents, their families, and others who are about them.

Our sample consists of about 20,000 non-profit, for-profit, and government nursing homes that underwent annual inspections from 1991 to 1997. We test several sets of hypotheses. We compare non-profit and for-profit nursing homes for differences in performance (quality and efficiency). We predict that for-profits will have lower quality and higher efficiency. We also examine the effects of for-profit and non-profit competition on the performance and exit (either

through closures or acquisitions) of each of these two organizational forms. We develop alternative arguments that contrast emulation and segmentation effects of for-profit competition on non-profit performance. We also expect for-profit competition to lead to greater non-profit closure and acquisition, while developing alternative arguments concerning the types of acquirers. In turn, we expect acquisition to lead to changed performance at target facilities. Finally, we develop alternative emulation and segmentation arguments concerning performance change at surviving facilities. The analyses allow us to trace out the recent dynamics of the sector, to determine whether it is converging on a for-profit model or whether it has achieved at least a temporarily stable segmentation into different quality-cost combinations.

QUALITY AND EFFICIENCY AT FOR-PROFIT CHAINS

Several studies in economics and management have examined the effect of efficiency and quality in markets undergoing commercialization. In part, how one views this issue depends on one's theory of markets. Stylized microeconomic theory predicts that the for-profit organizational form leads to efficient production because of the high-powered incentives that arise from the presence of a well-defined residual claimant with enforceable property rights (Kessler and McClellan, 2001). Theorists with a strong view of market efficiency tend to believe that for-profit conversion is a natural result of market efficiency, in which a corporate form that does a better job of meeting consumer demands for price and quality combinations will drive out inferior earlier forms of business. Theorists with a less sanguine view of market effectiveness question whether the corporate form is necessarily superior. Instead, the for-profit organization may simply dominate because of institutional pressures that favor its existence over more service-oriented but less market-survivable organizations.

Below, we examine studies pertaining to these contesting theories and formulate several hypotheses concerning effects of commercialization and chain membership on performance and exit of various forms of organizations in an industry. For brevity, we will focus the hypotheses on a comparison of chain-affiliated for-profits to independent non-profit facilities. The empirical analysis will break out for-profit and non-profit status, as well as chain and independent affiliation. In addition, we focus much of the literature review on studies in the health sector, both because this is the empirical setting of this study and because the health sector has received most prior attention in this comparative literature.

For-profit chain v. non-profit independent performance in a market environment

Comparison of performance among for-profits and non-profits typically examines measures of operating or productive efficiency and service quality. Most studies have examined the health care sector, focusing on physician groups and hospitals. Overall, studies generally support better efficiency standards in for-profits but show mixed findings as far as quality differences are concerned.

Several studies in the medical sector report higher productive efficiency in the for-profit form (Wilson and Jadlow, 1982; Herzlinger and Krasker, 1987; Fazel and Nunnikhoven, 1992; Cutler and Horwitz, 2000). In a cross-sectional analysis of differences in hospital efficiency, Rushing (1974) found that, all else being equal, non-profit hospitals employed significantly greater numbers of management, administrative, and other support personnel than for-profit hospitals. In studying the association between market bed capacity and higher hospital expenditures along ownership types, Kessler and McClellan (2001) suggest that non-profits may tend to invest in excess bed capacity, while for-profits are more apt to convert bed capital to more profitable uses, such as rehabilitation services. Ben-Ner (2002) theorizes that the operational efficiency of non-profit organizations is likely to improve as technological advances enhance stakeholder access to budgetary and operational information and enable stricter audit and managerial control.

Sloan (1998) summarized findings from three large-scale studies of non-profit and for-profit hospital service quality. Two studies reported no statistical difference in overall quality between the two ownership types (Shortell and Hughes, 1988; Keeler, et al., 1992). Sloan, et al. (2001) reported no significant differences in quality along ownership status in a four-wave panel study between 1982 and 1994. McClellan and Staiger (1999) initially found that the service quality as measured by mortality rates was, on average, lower in for-profit hospitals than in non-profits in 1984-1994 but for-profits if anything appeared to provide better quality of care after adjusting for market-specific factors such as location choice. By contrast, numerous studies in the nursing home sector report lower overall satisfaction levels and lower quality of care in for-profit nursing homes (Weisbrod, 1988; Gertler and Waldman, 1994; Spector, et al., 1998; Banazak-Holl, et al., 2002). However, Hirth (1999) theorized that findings of quality differences between the two ownership types did not constitute verification of the benefits associated with

the non-profit sector, because non-profits may compete in different market segments than for-profits.

Parallel arguments arise for chain affiliates and independent facilities. Theories of the multi-facility firm argue that significant efficiency differences may exist between chain components and independent firms within an industry (Chandler, 1977). The chief advantage of chain organizations lies in their ability to generate scale and scope economies. In the service industry, such advantages may be conferred through risk sharing, access to wider pool of resources, centralizing functions such as purchasing, and sharing of management support and skilled personnel. Some of these gains are possible only in chains that are located in the same geographic region (e.g., sharing skilled personnel and providing a wider-range of care) while others such as sharing management support systems may not depend on regional concentration (Baum, 1999). In addition, because chains commonly standardize across services, they can enhance predictability of services. This in turn enhances reliability and reputation of the chain (Ingram and Baum, 1997; Baum, 1999). Further, every chain component is exposed to the experience of other chain components, which serves to enhance the learning curve for these organizations. Thus, the chain develops technical and market expertise at a rate much faster than its independent competitors (Scherer and Ross, 1990; Fazel and Nunnikhoven, 1993). Chains may also have the ability to circumvent the problem of indivisible capital. For instance, nursing homes may face state imposed moratoriums when attempting to expand existing facilities or build new facilities.

Chains also may have the potential advantage of transferring residents from one of their member homes to another facility. Hirth, et al. (2000) show that nursing home transfers in Maine and New York are infrequent, in general, but nonetheless document a transfer rate of 4.4% to 8% during the first six months of resident stay, after which transfer rates decline. Moreover, the study examines nursing home resident transfers in general rather than within-chain transfers.

Empirical studies have generally demonstrated higher operating efficiency standards in chain organizations. Fournier and Mitchell (1997) found significantly lower operating costs in multi-hospital systems as compared to non-system hospitals. Arling, Nordquist, and Capitman (1987) and Fazel and Nunnikhoven (1993) reported lower per-resident operating costs in chain-affiliated nursing homes.

At the same time, chain membership may also have drawbacks. The separation of ownership (parent corporation) and control (management) in chain components could give rise to the agency problem where the contract between the firm and capital suppliers may be difficult to enforce and subject to opportunism (Williamson, 1964; Jensen and Meckling, 1976). Managers may increase their own compensation at the expense of profits. In the nursing home industry where quality of services is not always easy to measure, managers may increase compensation at the expense of service quality (Luksetich, et al., 2000). Standardization of services may also prove to be a strategic constraint for chain components. In particular, a chain component may have to adhere to standard operating procedures laid out by the parent organization. This gives them relatively less freedom to cater to the specific needs of the local population (Ingram and Baum, 1997). Adverse effects could arise in instances where the chain's strategy does not match local needs. In the health care industry, this inflexibility could translate into provision of a set range of services in a standardized manner. Resident demands may often vary depending on their physical and cognitive capabilities, however, and standardized protocols are less adaptable to suit individual residents. Depending on the amount of flexibility that resident care personnel are given, there is a potential for neglect or under-provision in some areas of the care program, which could lead to health care deficiencies. We anticipate that chain membership may lead to an overall reduction in quality of services.

Together, then, we hypothesize that chain-owned for-profit organizations have greater efficiency and lower quality than non-profit independents.

Hypothesis 1a: On average, independent non-profit nursing homes will have higher quality and lower efficiency than chain-affiliated for-profit facilities.

Chain size also might influence efficiency and quality. Larger chains are likely to be more efficient, owing to greater economies of scale. In addition, larger chains may be able to provide greater administrative oversight that leads to superior quality at individual facilities. Larger size could also generate more learning experience and allows increased sharing of routines and knowledge across component units. Costs of knowledge generation may be lower (Argote, et al., 1990), while the greater experience and resulting learning may contribute to better service quality. In contrast, smaller chains can realize only limited scale and scope economies. Hence, attempts to minimize costs may potentially come at the expense of reduced service quality.

Hypothesis 1b: The larger a chain, the greater the efficiency and the greater the quality of a facility within the chain.

We also expect competition from for-profit chains to affect the performance of non-profit independents. There are two possibilities here, of service emulation or of market segmentation. In the emulation view, Kessler and McClellan (2001) note that, in markets with a high density of for-profit hospitals, non-profits may be less able either to provide social benefits or may impose social costs. Some analysts refer to this tendency as “for-profits in disguise” (Weisbrod, 1988; Hirth, 1999).

Alternatively, Grabowski and Hirth (2003) suggest that the non-profit form could actually thrive when for-profit competition is high. They posit two models. In the “asymmetric information” model, non-profits act as a signal of quality to poorly informed customers in a market with a large number of for-profits. In the “full information” model, non-profit status is no longer a necessary signal of quality, but non-profit facilities intentionally stake out the high quality, high cost end of the market. This choice is driven by factors such as managerial preferences, that is, managers of non-profits may value their community image as high-quality providers. Both models suggest that for-profit chain competition with its potential downsides of lower quality may be able to coexist with the high quality, high cost non-profit form, possibly in different niches within the market.

Deepphouse (1999) suggests a strategy of rational differentiation for organizations in competitive markets. The premise of the argument is that the organization that selects a distinct market position in what it perceives to be an unexploited or underexploited niche gains competitive advantage and increases performance, perhaps even through a local monopoly. The competitive goal is to seek niches that are different enough to confer competitive advantages yet similar enough so that customers understand and accept the organization’s way of conducting business (Deepphouse, 1999: 162). Profits from a distinct position will persist depending on the ability of competitors to imitate that position. For-profit nursing homes may be unable to stake the high quality, high cost market niche owing to lower profitability from revenue constraints due to fixed governmental reimbursements levels. Non-profits generally do not have a profit-maximizing goal and hence, may be able to survive in the high quality, high cost segment in spite of increased for-profit competition.

We offer alternative predictions here. The alternatives depend on whether for-profits are forcing non-profits to compete directly with them, or whether the two forms are operating in different market segments. One possibility is that greater prevalence of for-profit chains will drive non-profits to emulate their for-profit competitors. If so, then we would expect efficiency to increase and quality to decrease at non-profits that operate in markets with high for-profit competition.

Hypothesis 2: Greater for-profit chain competition will lead to lower quality and greater efficiency in independent non-profit homes in a local market.

Alternatively, competition from for-profit chains might lead non-profits to focus on high-cost, high-quality segments of the market. Such segmentation might arise either from adaptation by existing non-profits as for-profit competition increases or by entry of new non-profits. We will examine both possibilities in the analysis.

Hypothesis 2 alt: Greater for-profit chain competition will lead to higher quality and lower efficiency in independent non-profit homes in a market.

Just as for-profit competition might impact non-profit facilities, an increased concentration of non-profits in a market could affect quality and efficiency standards in for-profit nursing homes. In their analysis of the nursing home data from the Online Survey, Certification and Reporting System (OSCAR), Grabowski and Hirth (2003) document the effect of beneficial spillovers from non-profit to for-profit facilities in a local market, finding that an increased non-profit nursing home share improves for-profit and overall nursing home quality. We will examine this potential influence as an empirical issue.

Non-profit exit

It is important to understand industry dynamics in terms of the exit of non-profit nursing homes in the face of competition from for-profit chain facilities. Individual nursing homes may exit either by closing down or by being acquired by another organization. Our focus is on the exit of the traditional form in the nursing home sector – the non-profit form. Standard neoclassical theory maintains that when markets have more stringent competition, then less efficient firms will close until remaining, more efficient firms are able to earn a normal return. In regard to acquisitions, Morrissey and Alexander (1987) highlight the economic rationale underlying the acquirer's decision. Specifically, if the sales price of a unit is below the chain's estimate of the net present value of the target's income stream, the chain acquires the unit. Mitchell (1994)

provides the strategic basis for the two-way dynamics of chain acquisition and suggests that purchase occurs when there is an alignment of interests between the buyer and seller. Baum (1999: 545) extends this argument and contends that the likelihood of acquisitions is higher when characteristics of a nursing home are such that it could be more effectively operated as part of a chain.

Empirical studies report varied relationships between ownership type and exit likelihood. In a study of hospital closures between 1986 and 1991, Deily, et al. (2000) find that less efficient hospitals are more likely to close regardless of ownership type. In a study of nursing homes, however, Baum (1999) reports differentiation along ownership types, finding that chain organizations are far more likely to acquire for-profit independent homes than non-profit homes.

In general, non-profits may find it difficult to compete with more efficient for-profit chains. If so, then we would expect greater exit rates in markets with higher for-profit chain presence.

Hypothesis 3: The greater the local market competition from for-profit chains, the more likely an independent non-profit facility will exit, through either closure or acquisition.

An extension of the acquisition argument concerns who will do the acquiring. One possibility is that for-profits will acquire non-profits as part of a market consolidation strategy in markets that they already dominate.

Hypothesis 4a: The greater the local competition from for-profit chains, the more likely a non-profit facility will be acquired by a for-profit chain.

In addition, competition from for-profits might also lead to combinations in which non-profits acquire other non-profits in attempts to gain economies of scale.

Hypothesis 4b: The greater the local competition from for-profit chains, the more likely a non-profit facility will be acquired by a non-profit chain.

Post-acquisition performance of non-profit targets

In turn, it is important to consider how acquisition of a non-profit facility will affect the non-profit target's performance. We are interested in cases where the resources of the non-profit entity are purchased by a for-profit chain and the non-profit ceases to exist in its original form.² Empirically, we will also examine cases in which non-profit chains are the acquirers.

Acquisitions have potential positive and negative impact on target performance. Acquisitions may help facilities gain operational efficiencies and economies of scope. In a study

of non-profit and for-profit ownership conversions, Mark (1999) finds improvements in hospital financial performance for both for-profit and non-profit conversions. In a panel study on hospital conversions to for-profit status, Picone, et al. (2002) report higher mortality rates in one to two years post-acquisition along with rise in hospital profitability and decrease in staffing. At the same time, though, as we noted earlier, factors that provide efficiency gains may pose constraints to quality in service provision, although few studies have examined post-acquisition performance. Accordingly, we expect that chain acquisitions in general and for-profit chain status in particular lead to an increase in efficiency and a decrease in quality of acquired organizations.

Hypothesis 5: Acquisitions of non-profits by for-profit chains lead to an increase in efficiency and a decrease in quality at the target facilities.

Just as it is important to consider the performance of acquired non-profit facilities, it is useful to consider the effect of for-profit competition on changing performance of surviving non-profits. The arguments here parallel the earlier discussion of segmentation and emulation. In that discussion, we argued that non-profits could either emulate their for-profit competitors or, instead, differentiate themselves within high quality-high cost market segments. The earlier discussion focused on cross-sectional emulation and segmentation effects, but did not address the process by which facilities arrived at a particular level.

We consider two alternatives. If emulation is strong, then for-profit competition may lead surviving non-profit facilities to reduce their quality and staffing. By contrast, if segmentation is strong, then for-profit competition may lead surviving non-profit facilities to increase their quality and efficiency.

Hypothesis 6: Greater local market competition from for-profit chains leads to reduction in quality and costs at surviving non-profits.

Hypothesis 6 alt: Greater local market competition from for-profit chains leads to increased quality and costs at surviving non-profits.

In summary, we note that several studies, mainly in the health sector, provide only limited answers concerning the impact of commercialization of non-profit sectors. Perhaps the dominant finding is that for-profit chain organizations tend to operate somewhat more efficiently than independent non-profits, at least in terms of operating costs. There is much less consensus, though, about how conversion to for-profit status affects the quality and availability of services.

The issue has received the most attention in the health sector, where many policy analysts fear that commercialization will damage service quality but, even there, studies are few. Perhaps most importantly, many of existing studies are cross-sectional analyses that cannot identify causality in any relationships between for-profit status and service quality. We undertake systematic longitudinal analysis to best determine the nature of relationships among ownership types, conversion and effects on performance.

U.S. NURSING HOMES

We tested our model using data on nursing home chains and their components in the continental United States between January 1991 and September 1997. We draw our data from a longitudinal data set linking yearly files of the federal OSCAR (*On-line Survey Certification and Reporting System*) data, which includes information from the state-based inspections of all Medicare and Medicaid certified nursing homes operating in the continental U.S. OSCAR covers almost every nursing home in the U.S. Data include facility-level information on nursing home strategy and structure (e.g., size, staffing and services), resident case mix (e.g., percentage incontinent), chain membership, and any deficiencies recorded during annual inspections. In total, the data include about 100,000 records, covering nearly 20,000 unique nursing homes.

Key to our analyses is the operationalization of ownership status, chain membership, and the occurrence of acquisitions. Ownership status was straightforward, because the OSCAR data indicate whether a facility has non-profit, governmental-affiliated, or for-profit ownership.

Determining chain membership was more complicated. The data include the name of the multi-institutional corporation to which a nursing home belongs. Approximately half of the nursing homes in these data report a corporate owner. We coded chain membership from names reported in the OSCAR data. We assessed inconsistencies by comparing the spelling of names, inter-temporal relationships with specific homes, and geographic linkages. Finally, we checked corporate ownership for large chains using 1990-1998 volumes of the *Medical and Healthcare Marketplace Guide* (Dorland's Biomedical Publications), which is an annual publication providing information on commercial companies operating in the U.S. healthcare sector. We defined chains as cases in which the same business was identified as owner of two or more facilities in any given calendar year. We identified nearly 3,000 unique multiunit corporate owners in the data. The proportion of chain nursing homes was slightly over 40% during the

period although most chains were quite small, with fewer than 7% of corporate owners operating more than 10 homes.³ Thus, extensive chaining of nursing homes exists, but it is primarily a small-scale phenomenon.

Identifying acquisitions - approximately 5,000 in number during the study period – followed the identification of annual ownership. We coded acquisitions as cases in which corporate ownership of a nursing home changed between inspection periods.

Table 1 reports the distribution of different types of facilities during the study period. Part A of the table reports that there were more than 18,000 facilities in the sample at the end of the study period (column 1b). Of these, for-profit chains made up about 34% of the facilities, while independent for-profits comprised another 33%. Independent non-profits totaled 19%, with another 8% being non-profit chains. The remaining facilities (6%) were owned by government entities such as counties and cities.

***** **Table 1 about here** *****

Part B of Table 1 reports mean performance of the different types of facilities, reporting health deficiencies (column 2a) and staffing levels (column 2b). Health deficiencies are the number of deficiencies that state inspectors report during annual inspections of a facility. Our measure weights the number by the state average during the study period, because there are substantial state-specific differences in reported deficiencies, resulting from different approaches to inspection in different states (some states have specific nursing home inspection units, while others use more general-purpose inspectors who also are responsible for other tasks such as restaurant inspections). Health deficiencies are a common measure of nursing home quality.

Our staffing measure is the number of health care staff per resident in a home. The health care staff numbers include full-time equivalents (FTEs) for registered nurses, licensed practical nurses, and nursing aides. Staffing is by far the largest operating expense within a nursing home. Any increase in the number of nurses or aides, while potentially improving resident care, also increases costs. As a result, staffing ratios are a major indicator of efficiency.

The raw means of the performance indicators in Table 1 are a useful start for the comparisons. They report that non-profit facilities have fewer deficiencies and higher staffing than for-profit facilities (government-owned facilities are similar to the non-profit levels). The table also reports fewer quality and cost differences among chains versus independent facilities, although chains have slightly higher deficiencies and slightly lower staffing. Thus, non-profits

appear to offer higher quality than for-profits, at higher cost. One assumption we make here is that for-profit facilities do not pay higher rates for staff than non-profit facilities. If, instead, nursing staff at for-profits did receive higher wage, then the cost gap between for-profits and non-profits might disappear. However, there is no evidence of such a wage differential.

The quality and cost differences are consistent with hypothesis 1a. However, both staffing and quality can be affected by resident case mix and payment models, so that we will need multivariate analysis to determine whether the differences are intrinsic to the organizational forms or whether they result from differential populations of residents.

Part C of Table 1 reports the distribution of residents by payment source in different classes of facilities. The interesting point here is that non-profit facilities have a substantially higher proportion of Medicare and private-pay residents than for-profit homes. On average, Medicare per diem payments are substantially higher than other payment sources, as Table 1 reports, although Medicare typically limits its coverage to only a few weeks or months. Private payment is typically higher than Medicaid, especially when residents need care beyond simple residential care (we will discuss this in greater detail at the end of the paper). Thus, non-profit facilities appear to be positioned at the higher-revenue Medicare and private-payment end of the market, while for-profits have a substantially larger presence in the lower-revenue Medicaid portion.

At the same time, though, there is substantial overlap in population within individual homes. Much of the overlap occurs because residents commonly transition from one payment status to another. In particular, private payment status lasts as long as residents have financial resources to draw on, after which they convert to Medicaid status.

Part D of Table 1 reports 1996-1997 performance levels of facilities that entered during the study period. Columns 4c and 4d show that they tended to have fewer deficiencies and higher staffing than comparable facilities.

ANALYSIS

Does performance differ?

We begin the analysis with a multivariate comparison of the performance of different ownership forms. Table 2 reports a least squares regression analysis, which tests hypotheses 1a and 1b. We report both an all-years pooled analysis, with multiple records per facility, and an

analysis of the last year in the study period, with one record per facility. Appendix 1 reports summary statistics for the variables.

******* Table 2 about here *******

The analysis in Table 2 includes a substantial set of control variables. These include facility characteristics (home size), resident case mix (residents requiring restraints, incontinence, residents needing anti-psychotic drugs), payment mix (Medicare, Medicaid, private payment), local market characteristics (concentration and size, using counties as definitions of local markets), state characteristics (the presence of regulations governing new facility expansion – based either on requirements for a “Certificate of Need” or an outright construction moratorium), and time effects (calendar year). We note that the results are robust to including other facility, market, and state characteristics.

The multivariate results in Table 2 are consistent with the raw means in Table 1. For-profit facilities have higher deficiencies and lower staffing. Chains tend to have somewhat higher deficiencies and lower staffing. These patterns are consistent with hypothesis 1a. Table 2 also shows that larger chains have lower deficiencies and lower staffing, consistent with hypothesis 1b. Thus, for-profit chains tend to be more efficient, but provide lower quality. Greater chain size leads to even greater efficiency, while somewhat attenuating the quality trade-off.

Figures 1a and 1b depict the performance differences for varying chain sizes. Figure 1a shows that independent non-profits provide greater quality, measured in terms of low deficiencies, than any other ownership form of any chain size. The key point in figure 1b, meanwhile, is that independent non-profits offer higher staffing than chains of any size or ownership status.

******* Figures 1a and 1b about here *******

The initial conclusion, then, is that independent non-profits have higher quality and lower greater costs than for-profit chains, controlling for a wide range of facility, resident, and market characteristics. However, these aggregate results may conceal very different local market dynamics. On the one hand, it is possible that for-profits and non-profits segment local markets, carving out different quality-cost positions. On the other hand, it is possible that non-profits tend to emulate the for-profits as they come to dominate local markets.

Does local market competition cause segmentation or emulation?

Table 3 reports the impact of local market competition on facility quality and staffing. We defined local markets in terms of nursing home presence in particular counties. Counties are both conceptually appealing and empirically tractable as measures of competition. Conceptually, residents and their families commonly consider and compare nursing home facilities within counties, which tend to have distinct demographic characteristics. Empirically, it is straightforward to aggregate statistics at the county level, because there are standard concordances between facility zip codes, which the annual surveys record, and county identities.

******* Table 3 about here *******

Table 3 reports performance influences for both non-profit and for-profit facilities. Columns 1a and 1b report outcomes for non-profits. Columns 2a and 2b report outcomes for for-profits.

The key point in columns 1a and 1b is that increasing for-profit concentration in a county leads to fewer deficiencies and greater staffing by independent non-profits in the county. Thus, the patterns suggest a segmentation of the local markets by non-profits and for-profits, rather than an emulation of for-profits by non-profits. Non-profits appear to occupy the high quality-high cost segment relative to for-profits. This pattern rejects H2, while being consistent with H2 alt.

Columns 2a and 2b of Table 3 undertake an exploratory analysis of how competition affects for-profit performance. The key point here is that greater for-profit competition leads to improved quality and greater staffing overall. That is, for-profits appear to force each other to improve quality, seemingly at the cost of lower efficiency. This pattern of results suggests that consumers may prefer higher staffing than for-profits would prefer to provide and only competition can force such staffing levels. While it is interesting to note that for-profit competition results in improved quality and greater staffing in local market for-profits, we are unable to conclude if improved quality and staffing levels parallel those of non-profits in the same market. However, columns 1b and 2b do show the effect on staffing in non-profits is more than double than that in for-profits. This may be an indication that segmentation is still underway even if overall staffing levels increase.

Intriguingly, greater presence of non-profit chains also leads to higher staffing by non-profits (column 1b) and for-profits (column 2b), although there is no effect on quality (columns

1a and 2a). Thus, the chain form – whether for-profit or non-profit – has a competitive impact on other facilities.

The second conclusion, then, is that the local nursing home markets are undergoing a process of competitive segmentation and differentiation where non-profits and for-profits tend to move towards different quality-cost segments. What is not clear, though, whether these segments are sustainable or, instead, whether non-profits tend to exit, leaving the market to for-profit competitors.

Are non-profits leaving competitive markets?

Table 4 assesses whether for-profit competition causes non-profit exit, examining both closures and acquisitions. The key issue here is whether non-profits are systematically leaving local markets with high for-profit presence, thereby leading to increasing consolidation and expansion of the low cost-low quality segment of the market. The analysis in Table 4 is based on a logistic regression analysis, which codes outcomes as 0-1 variables in each calendar year. A coding of 1 means that a facility exited – whether by closing (column 1) or by being acquired (columns 2 to 5).

******* Table 4 about here *******

We defined closure on finding a final inspection record for a facility between 1991 and 1995. We chose 1995 as the final year for defining closure because inspections sometimes lag more than a year. Our final inspection period was September 1997, which allows almost two years for a facility to reappear in the data. The independent variables are lagged by a year in this analysis.

Column 1 of Table 4 examines non-profit closures. The analysis shows that local market presence of for-profit facilities has no effect on the closure of non-profit independents, counter to the closure prediction within hypothesis 3. Thus, local non-profits are not being systematically forced out of business by for-profit competition. Instead, at least during the study period, they were able to sustain themselves within the high cost-high quality segment of the market.

The remaining models in Table 4 examine acquisitions. The independent variables again are lagged by a year. Unlike closures, we find striking competitive effects on acquisitions.

Column 2 of Table 4 examines all acquisitions of non-profits. Greater competition from for-profits and from non-profit chains leads to more common acquisition of non-profits, consistent with the acquisition aspect of hypothesis 3. Thus, even though competition is not

forcing non-profits to close, it is causing them to change ownership. What is not clear, though, is whether the change in ownership involves acquisition by for-profits, leading to for-profit consolidation, or by non-profit chains, leading to competition between for-profit and non-profit chains.

Columns 3 and 4 of Table 4 differentiate between acquisition by non-profits and acquisition by for-profits, testing hypothesis 4a and hypothesis 4b. Column 3 shows that non-profits commonly are acquired by non-profit chains as competition from for-profits and from non-profit chains increases, consistent with hypothesis 4b.

By contrast, column 4a shows that non-profits are less likely to be acquired by for-profits as for-profit independent or non-profit chain share increases, rejecting hypothesis 4a. Column 4b repeats the analysis of column 4a with a different comparison set. This analysis shows that for-profit acquisition of non-profits is highest when independent non-profits have a high local share.

Column 4 also reports an intriguing set of results concerning the characteristics of non-profit facilities that for-profits target for acquisition. It is particularly useful to assess the impact of target quality and efficiency on the likelihood that it will be acquired.

We note first that non-profit deficiency levels have no impact on acquisition by for-profit chains. This neutral result is somewhat comforting in a policy sense, because it provides reassurance that for-profits are not systematically targeting high quality non-profits for their expansion, thereby putting them at risk of reduced quality. At the same time, though, for-profits also are not systematically targeting poor quality non-profit facilities that they might improve; instead, non-profit chains appear to be taking on that task (column 3).

We note next that column 4 shows that for-profit chains are targeting non-profit facilities with relatively low staffing levels for acquisition. This result is again a comforting policy result, because it indicates that for-profits are not systematically removing facilities that provide high staffing levels and presumably higher levels of care from the market. Again, the result is consistent with the notion of an ongoing quality-cost market segmentation by for-profits and non-profits.

Column 5 of Table 4 examines all acquisitions. The key point here is that acquisition is most common when competition from for-profit chains and non-profit chains is highest. That is, chain presence in a local market leads to more volatile acquisition dynamics. At the same time, the model also shows that for-profit facilities are more likely to be acquired than non-profit or

government facilities. Thus, acquisition is more a matter of shuffling and realigning for-profit competitors than it is a conversion of non-profits to for-profit status.

The third conclusion, then, is that competition leads to acquisition of non-profits. The most common case, though, is that the acquirers tend to be non-profit chains rather than for-profit chains. Nonetheless, for-profit chains do use non-profit acquisitions as a means of expanding in markets that have a high independent non-profit presence, suggesting that acquisition provides a means by which for-profits can carve out an initial segment.

What is unknown is how acquisition of a non-profit affects the quality and staffing at the target non-profit. Acquisition by a non-profit chain might lead to a reinforcement of the segmentation into the non-profit and for-profit sectors, again with non-profits emphasizing higher quality and higher costs. In parallel, acquisition by a for-profit chain might lead to reduced quality and costs.

Does performance change at acquired non-profits?

Table 5 reports least squares regression analysis of the change in performance of acquired non-profit facilities. The dependent variables in the analysis are the one-period change in deficiencies (column 1) and staffing (column 2) of non-profit U.S. nursing homes. We are interested in whether deficiencies and staffing change when a facility is acquired. We examine both one-period and two-period acquisition lags, in order to allow time for post-acquisition changes to take effect.

******* Table 5 about here *******

The for-profit acquisition results in columns 1 and 2 are consistent with hypothesis 5. Column 1 shows that deficiencies increase when a for-profit chain acquires a non-profit facility. The increases happen both in the first post-acquisition period and again in the second year after acquisition. Column 2 shows that staffing decreases slightly, especially during the first post-acquisition period. The weaker impact on staffing likely occurs because for-profit facilities tend to target non-profits that already have low staffing levels, as Table 4 reported.

Columns 1 and 2 of Table 5 also assess how acquisition by non-profit chains affects performance at non-profit targets. Here, there are no significant effects on target quality or staffing, in either the first or second post-acquisition period. Thus, non-profit chains appear to continue to operate their targets with relatively few changes, whereas for-profit chains institute changes that lead to substantial change in quality and cost.

The fourth conclusion, then, is that for-profit chains change their non-profit targets, reducing both quality and, to a lesser extent, staffing. Because there are relatively few acquisitions of non-profits by for-profits (172 cases in our study period, versus 489 acquisitions of non-profits by non-profits), this impact is relatively limited. What is unknown, though, is whether for-profit competition also causes the performance of surviving non-profits to change. This is potentially a far more important issue, because there are many more survivors than targets.

Does competition cause performance to change at surviving non-profits?

Table 6 assesses how local market competition affects performance at surviving non-profit and for-profit facilities. We examine change in performance of facilities that existed both at the beginning and end of the study period. We measure change in performance as the change in deficiencies and staffing between 1991-1992 and 1996-1997.

***** **Table 6 about here** *****

Columns 1a and 1b of Table 6 report changes at surviving non-profit facilities. The key results are that deficiencies decline and staffing increases at independent non-profits when for-profit facilities have a high local market share. This pattern of results rejects hypothesis 6 (emulation) and supports hypothesis 6 alt (segmentation). Note that this is not a survival bias in which population average performance rises due to the attrition of poor quality facilities, because the individual surviving firms change, rather than the subpopulation average.

As exploratory analysis, columns 2a and 2b examine performance changes at surviving for-profits. Here, we find that greater for-profit competition leads to improved quality at surviving for-profits, consistent with the cross-sectional effects that we observed in Table 3. By contrast, for-profit quality declines when the primary competition arises from non-profit chains. Again, this is further evidence for market segmentation in which for-profits primarily compete with other for-profits, rather than with non-profits.

The fifth conclusion, then, is that there appears to be a sustainable segmentation in U.S. nursing home markets, at least during the seven-year period of the study. For-profit facilities provide lower cost-lower quality care. Non-profit facilities, especially independent non-profits, provide higher cost-higher quality care. There is little or no evidence of market convergence, either by take-over of non-profits by for-profits or of surviving non-profits emulating for-profit service levels.

DISCUSSION

The study finds distinct differences between for-profit chains and non-profit facilities in the U.S. nursing home sector. We use health deficiencies as indicators of quality and staffing levels as indicators of cost. Based on these indicators, independent non-profits have higher quality and greater costs than for-profit chains, controlling for a wide range of facility, resident, and market characteristics. Moreover, non-profits and for-profits tend to separate into different quality-cost segments in local markets.

At the same time, competitive local markets are highly dynamic, in terms of both acquisition and change by surviving facilities. Local market competition leads to acquisition of non-profits. The most common acquirers are non-profit chains, which presumably are seeking greater scale in order to compete with for-profit organizations. Nonetheless, for-profit chains do use non-profit acquisition as a means of expanding in markets that have a high independent non-profit presence. In turn, unlike non-profit acquirers, for-profit chains cause both quality and staffing to decline at their targets. At surviving non-profit facilities, meanwhile, quality improves and staffing increases when they face substantial competition from for-profit chains. Thus, the competitive dynamics appear to be encouraging and sustaining the segmentation in U.S. nursing home markets, at least during the seven-year period of the study, because there is little conversion of non-profits to for-profit performance levels, either by acquisition or by emulation.

Nonetheless, it is clear that the for-profit form is dominating the sector. In simple numbers, for-profits comprised about two-thirds of U.S. nursing home facilities in 1996-1997, with about half belong to chains and half being independent for-profits. Thus, while non-profits may have successfully differentiated within a high quality segment, that segment is very much the smaller part of the market. Moreover, there was a limited but non-trivial incidence of for-profit acquisition of non-profit facilities, followed by reduced quality and staffing at the target homes. Without continuing entry by high quality non-profits, the non-profit segment will gradually decline.

Perhaps reassuringly, then, the data suggest that such entry did occur during the study period. Part D of Table 1 reported that the raw numbers of non-profit entrants were sufficient to replace those that closed or were acquired by for-profit chains. Moreover, the entrants achieved at least average deficiency and staffing levels (Tables 1 and 2), rather than emulating the lower

levels of their for-profit competitors. Thus, stable market segmentation appears to have continued throughout the study period.

One might ask, then, how the segments differ in terms of prices. It would seem obvious that non-profits would tend to charge higher prices than for-profits, given that they offer higher cost services at higher cost. Such price differences would show up in the private-pay portion of the market, because Medicare and Medicaid payments are largely fixed by public policy. In practice, though, the private-pay price comparison is mixed. In fact, Gabrel (2000: Table 8) reports that for-profit facilities charge substantially higher prices for basic residential care, with rates of about \$100 per day in 1997 compared to \$81 at non-profits. At higher service levels, though, non-profit rates become higher than for-profit charges. For residents requiring intermediate or skilled care, Gabrel (2000) reports that non-profit per diems exceed for-profit charges by about \$15 per day (\$118 v. \$103 for intermediate; \$147 v. \$132 for skilled). Thus, for-profits charge more for basic care, while non-profits charge more for more intensive care.

This pattern does give rise to a puzzle, which is why the for-profit segment dominates the market. Non-profits appear to be a superior organizational form from a consumer point of view – they offer higher quality and lower prices in some market segments, despite higher costs, where the higher costs result from services that provide consumer value – yet they are a small minority of the market. Why does the non-profit form not expand and attract more residents?

A naïve answer might be that consumers do not know that non-profits provide superior care. This answer is highly unlikely, given the substantial press coverage of problems at for-profit facilities. Indeed, Ballou (2002) finds that residents actively seek out non-profits in preference to for-profits.

Rather than stemming from consumer blindness, the non-profit decline appears to stem from several constraints on the organizational form. The constraints include behavioral and structural inertia, as well as strategic constraints. Behavioral inertia arises from an organization's internal bureaucratic limits. Structural inertia arises from external market limits. Strategic constraints arise because of incompatibility of a new strategy with an organization's existing skills and customer-value.

First, behavioral inertia may impose limits non-profit expansion. Some analysts suggest that non-profits simply are not very responsive to market demands. By contrast, for-profits are

much more active in expanding bed capacity. Rather than simply blaming short-sighted management, though, we need to get at the roots of such constraints.

Second, then, non-profits face substantial structural limits on expansion, arising from financial advantages of the for-profit form and from the greater incidence of chaining among for-profits. Financially, for-profits typically can raise capital more freely than non-profits because they provide greater risk assurance. Moreover, the chain form introduces substantial structural advantages for the for-profit form. For-profit chains are larger, on average, than non-profit chains, while the largest for-profit chains are much larger than the largest non-profit chains. The greater incidence of chaining among for-profits provides opportunities for managerial skills that can support expansion. In addition, the reputational advantage of chains generates a higher profile in the market and helps attract residents. Moreover, the financial constraints limit the ability of non-profit chains to grow to the size of for-profit chains.

Third, though, strategic constraints also limit non-profit expansion. Given their higher costs, non-profits are best suited to the high price end of the market – Medicare and private-pay residents. Indeed, this is the end of the market in which non-profits have the strongest presence. To expand further, non-profits would need to make substantial inroads into the Medicaid-funded portion, which comprises almost two-thirds of the total market. For such expansion to be viable, non-profits would need to reduce their costs substantially. That is, they would need to undertake an emulation strategy, in which they reduced staffing to for-profit levels and, quite possibly, would find that their quality levels subsided to for-profit levels. Quite simply, non-profits cannot afford to have a high proportion of low-revenue Medicaid residents with their existing cost-quality approach. Thus, non-profit expansion is limited by the size of the private-pay and Medicare segments, which is a strategic constraint rather than a behavioral or structural constraint. Overall, then, this study suggests the presence and survival of distinct market niches based on nursing home quality and cost, with substantial limits on expansion into and out of each segment.

Further research could expand the findings. We differentiate between non-profits and for-profits, examining both chains and independent facilities. Additional investigation might differentiate further, to distinguish among chains that use common names and those that use different names for their facilities. We noted earlier that belonging to a common parent organization acts as a signal of reliability in services among chain components, as long as this

signal is apparent to nursing home customers. Thus, an interesting extension to this analysis is to study the relative standards of quality, efficiency, and competitive effects of for-profit and non-profit chain affiliates with and without common names.

Additional research might expand the study of nursing home dynamics to examine multimarket competition beyond the local market level. Multimarket contact is a joint presence in more than one distinct geographic market (Baum, 1999). Such contact is relevant for nursing home chains, because chain components often interact with other chains in more than one market. Competitors in such markets might engage in mutual forbearance and refrain from competing against each other. Nursing homes that meet in more than one market may even engage in cooperative behaviors, increasing the survival chances of their components. One potential downside to such collusive efforts may be lowered service quality. Chain components engaged in multimarket contact may lower competitive aggression, decreasing the incentive to differentiate through provision of better quality services. The forbearance theory also suggests that chain nursing homes may not enter markets with very high levels of multipoint contact (Haveman and Nonnemaker, 2000). Forbearance from competitive aggression taken to an extreme may jeopardize long-term survival. Multimarket dynamics may also have implications for individual nursing homes. The overall reduced competition may encourage individual nursing home entry and facilitate survival (Bernheim and Whinston, 1990). In a study of nursing home in Ontario, Baum (1999), however, finds that mutual forbearance among nursing home chains raised failure rate of for-profit independent nursing homes, but did not affect their non-profit counterparts. Thus, ownership status may lead to differential impact of multimarket contact on entry and survival of individual nursing homes.

It also would be useful to extend the study beyond 1997. The introduction of the Balanced Budget Act of 1997 substantially affected the financial structure of the nursing home sector (Saphir, 2000). The Act created a new prospective payment system that pays a flat per-day rate adjusted according to resident needs, which results in lower Medicaid and Medicare payments than in earlier periods. The system rewards low-cost care by allowing nursing homes to keep the difference between their costs and what Medicare pays them. These changes in the policy and revenue environments may change the competitive relationships between for-profit and non-profit facilities, as well as between chain and independent homes.

The current study provides a strong set of focal results. The analysis shows that non-profit and for-profit organizations are undergoing a process of segmentation and differentiation in local markets. We focus on the nursing home industry, where customer characteristics coupled with asymmetric availability of information presents a high potential for contract failure. Our results show that for-profit takeover eventually results in diminished quality, implying that the for-profit corporation may not be the optimal form of organization in the provision of nursing home care. The role of increased local market competition in improving overall service quality and staffing while still contributing to competitive segmentation and differentiation is noteworthy from a strategy perspective. Additionally, the results allay fears that the service sector, particularly the nursing home industry, is being taken over by the for-profit form. Indeed, we find that the total number of non-profit exits is relatively low. Surviving non-profits, if anything, seem to improve quality and have greater staffing. Moreover, non-profit chains seem to have a major role in cases where acquisitions do occur. Lastly, non-profits are continuing to enter the nursing home industry at a stable rate with quality and efficiency levels comparable to the past several years.

ENDNOTES

¹ Of course, non-profit firms also may earn profits, in the sense that they seek to have revenues exceed costs. However, while profits in for-profit firms are distributed among owners and equity-holders, the non-distribution constraint that applies to non-profits prohibits the distribution of profits among those associated with the firm (Weisbrod and Schlesinger, 1986).

² Other subtle forms of conversion include contracting out management services with for-profits, entering into a joint venture with for-profits, or having private ownership of assets but retaining other features of the non-profit form (Goddeeris and Weisbrod, 1998).

³ Approximately 5% of nursing homes reported belonging to a chain and provided a corporate name but no other facilities were found to belong to that corporation. We did not consider these nursing homes, which are sometimes part of a health provider system that includes facilities other than nursing homes (e.g., assisted living or hospital beds), as components of chains.

REFERENCES

- Argote L, Beckman SL, Epple D. 1990. The persistence and transfer of learning in industrial settings. *Management Science* **36**:140-154.
- Arling G, Nordquist R, Capitman J. 1987. Nursing home cost and ownership type: Evidence of interaction effects. *Health Services Research* **22**: 255-69.
- Ballou JP. 2002. An examination of the presence of ownership effects in mixed markets. *Institute of Policy Research Working Paper*.
- Banazak-Holl J, Berta WB, Baum JAC, Mitchell W. 2002. Comparing service and quality among chain and independent U.S. nursing homes during the 1990s. *Working Paper. University of Michigan*.
- Baum JAC. 1999. The rise of chain nursing homes in Ontario, 1971-1996. *Social Forces* **78**(12): 543-583.
- Ben-Ner A. 2002. The shifting boundaries of the mixed economy and the future of the nonprofit sector. *Annals of Public and Cooperative Economics* **73**(1): 5-40.
- Bernheim BD, Whinston MD. 1990. Multimarket contact and collusive behavior. *RAND Journal of Economics* **21**:1-26.
- Burns J. 1993. Chains put on new face ahead of looming reform: Despite uncertainty, nursing facilities expect sicker patients. *Modern Healthcare*: Crain Publishing.
- Chandler Jr. AD. 1977. *The Visible Hand*. Cambridge, MA: Belknap.
- Cutler DM, Horwitz J. 2000. Converting hospitals from not-for-profit to for-profit status: Why and what effects? In *The Changing Hospital Industry: Comparing Not-for-Profit and For-Profit Institutions*, Cutler DM (Ed.). University of Chicago Press: Chicago.
- Deephouse DL. 1999. To be different or to be the same? It's a question (and theory) of strategic balance. *Strategic Management Journal* **20**:147-166.
- Deily ME, McKay NL, Dorner FH. 2000. Exit and inefficiency: The effects of ownership type. *Journal of Human Resources* **35**(4): 734-747.
- Fizel JL, Nunnikhoven TS. 1992. Technical efficiency of for-profit and non-profit nursing homes. *Managerial and Decision Economics*. **13**(5):429-439.
- Fizel JL, Nunnikhoven TS. 1993. The efficiency of nursing home chains. *Applied Economics* **25**(1):49-56.
- Fournier GM, Mitchell JM. 1997. New evidence on the performance advantages of multihospital systems. *Review of Industrial Organization* **12**: 703-718.
- Gabrel, CS. 2000. An Overview of nursing home facilities: Data from the 1997 national nursing home survey. *Advance Data*, #311 (March 1), Centers for Disease Control and Prevention, National Center for Health Statistics.
- Gertler P, Waldman DM. 1994. Why are not-for-profit nursing homes more costly? *RAND Labor and Population Program Working Paper No. 94-11*, Santa Monica, CA: RAND.

- Goddeeris JH, Weisbrod BA. 1998. Conversion from nonprofit to for-profit legal status: Why does it happen and should anyone care? *Journal of Policy Analysis and Management* **17**:215-233.
- Grabowski DC, Hirth RA. 2003. Competitive spillovers across non-profit and for-profit nursing homes. *Journal of Health Economics* **22**: 1-22.
- Hansmann H, Kessler D, McClellan M. 2002. Ownership form and trapped capital in the hospital industry. *NBER Working Paper Series*.
- Hansmann H. 1996a. The changing roles of the public, private and the non-profit enterprise in education, health care and other human services. In: Fuchs V. (Ed.). *Individual and Social Responsibility: Child Care, Education, Medical Care and Long-Term Care in America*. Chicago: University of Chicago Press.
- Hansmann H. 1996b. *The Ownership of Enterprise*. Cambridge, MA: Belknap.
- Haveman HA, Nonnemaker L. 2000. Competition in multiple geographic markets: The impact on growth and market entry. *Administrative Science Quarterly* **45**:232-267.
- Herzlinger RE, Krasker WS. 1987. Who profits from nonprofits? *Harvard Business Review* 93-106.
- Hirth RA, Banaszak-Holl JC, McCarthy JF. 2000. Nursing home to nursing home transfers: prevalence, time-pattern and resident correlates. *Medical Care* **38**:660-669.
- Hirth RA. 1999. Consumer information and competition between nonprofit and for-profit nursing homes. *Journal of Health Economics* **18**:219-240.
- Ingram P, Baum JAC. 1997. Chain affiliation and the failure of Manhattan hotels, 1898-1980. *Administrative Science Quarterly* **42**: 68-102.
- Jensen MC, Meckling WH. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**:305-60.
- Keeler EB, Rubinstein LV, Kahn KL, Draper D, Harrison ER, McGinty MJ, Rogers WH and Brook RH. 1992. Hospital characteristics and quality of care. *Journal of the American Medical Association* **268**(13): 1709-1714.
- Kessler D, McClellan M. 2001. The effects of hospital ownership on medical productivity. *NBER Working Paper Series*.
- Light DW. 1986. Corporate medicine for profit. *Scientific American* **225**:38-45.
- Luksetich W, Edwards ME, Carroll TM. 2000. Organizational form and nursing home behavior. *Nonprofit and Voluntary Sector Quarterly* **29**(2): 255-279.
- Mark TL. 1999. Analysis of the rationale for, and consequences of, nonprofit and for-profit ownership conversions. *Health Services Research* **34**(1):83-90.
- McClellan M, Staiger D. 1999. Comparing hospital quality at for-profit and no-for-profit hospitals. *NBER Working Paper Series*.
- Mitchell W. 1994. The dynamics of evolving markets: The effects of business sales and age on dissolutions and divestitures. *Administrative Science Quarterly* **39**:575-602.

- Morrisey MA, Alexander JA. 1987. Hospital acquisition or management contract: A theory of strategic choice. *Health Care Management Review* **12**(4): 21-30.
- Norton EC. 2000. Long-term care. In: Cuyler AJ, Newhouse JP. (Eds.). *Handbook of Health Economics*. Volume 1. Amsterdam: Elsevier, pp.955-994.
- Picone G, Chou S, Sloan F. 2002. Are for-profit conversions harmful to patients and Medicare? *RAND Journal of Economics* **33**(3):507-523.
- Rushing W. 1974. Differences in profit and nonprofit organizations: A study of effectiveness and efficiency in general short-stay hospitals. *Administrative Science Quarterly* **19**:474-484.
- Saphir A. 2000. Bigger isn't better; our first post-acute-care survey finds that larger firms are faring worst in turbulent industry. *Modern Healthcare*. Crain Publications, July 24, 2000.
- Scherer FM, Ross D. 1990. *Industrial Market Structure and Economic Performance*. Boston, MA: Houghton Mifflin: 121-124.
- Shortell S and Hughes EFX. 1988. The effects of regulation, competition, and ownership on mortality rates among hospital inpatients. *New England Journal of Medicine* **318**(17): 1100-1107.
- Sloan FA, Picone GA, Taylor Jr. DHT, Chou S. 2001. Hospital ownership and cost and quality of care: is there a dime's worth of difference? *Journal of Health Economics* **20**: 1-21.
- Sloan FA. 1998. Commercialism in nonprofit hospitals. *Journal of Policy Analysis and Management* **17**(2): 234-252.
- Spector WD, Selden TM, Cohen JW. 1998. The impact of ownership type on nursing home outcomes. *Health Economics* **7**: 639-653.
- Tuckman HP. 1998. Competition, commercialization, and the evolution of nonprofit organizational structures. *Journal of Policy Analysis and Management* **17**(2): 175-194.
- Weisbrod B. 1988. *The Nonprofit Economy*. Cambridge, MA: Harvard University Press.
- Weisbrod BA, Schlesinger M. 1986. Public, private, nonprofit ownership and the response to asymmetric information: the case of nursing homes. In: Rose-Ackerman S. (Ed.). *The Economics of Nonprofit Institutions* New York: Oxford University Press.
- Williamson OE. 1964. *The Economics of Discretionary Behavior: Managerial Objectives in the Theory of the Firm*. Englewood Cliffs, NJ: Prentice Hall.
- Wilson GW and Jadow JM. 1982. Competition, profit incentives, and technical efficiency in the provision of nuclear medicine services. *Bell Journal of Economics* **13**: 472-82.

Figure 1a. Nursing home deficiencies: For-profit v. Non-profit (1991-1997)

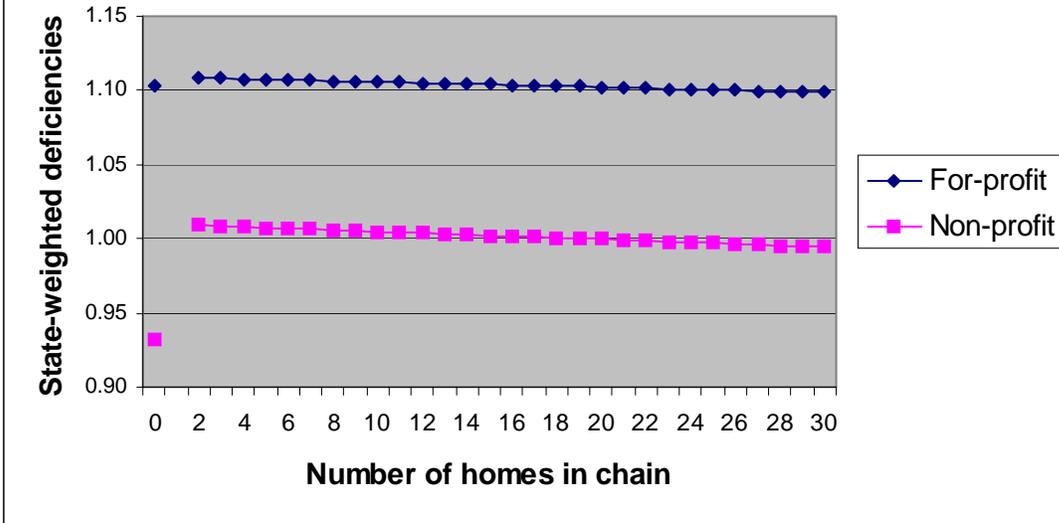


Figure 1b. Nursing home staffing intensity: For-profit v. Non-profit (1991-1997)

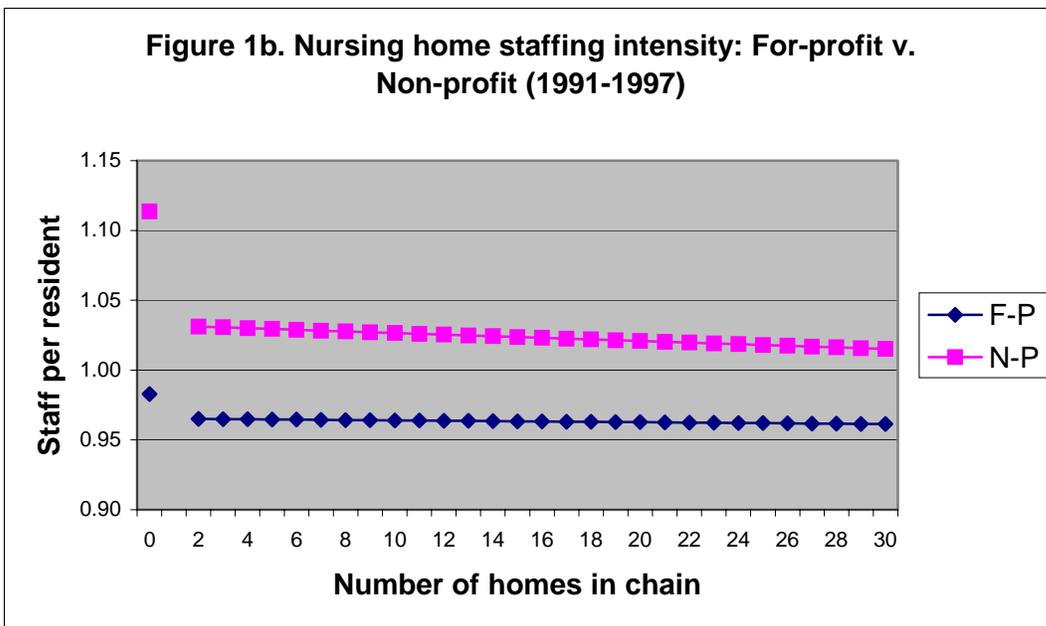


Table 1. Distribution of Facilities at Beginning and End of Study Period

	A. Proportion of facilities		B. Performance indicators * 1996-1997		C. Resident payment sources ** 1996-1997			
	1a 1991-1992	1b 1996-1997	2a Deficiencies	2b Staffing	3a Private	3b Medicare	3c Medicaid	Tot.
Ownership & chain status								
Non-profit: Independent	19%	19%	0.59	1.19	31%	19%	49%	100%
Non-profit: Chain-owned	7%	8%	0.59	1.14	31%	21%	48%	100%
For-profit: Independent	34%	33%	0.75	0.87	22%	7%	71%	100%
For-profit: Chain-owned	34%	34%	0.75	0.93	21%	13%	66%	100%
Government owned	7%	6%	0.59	1.13	23%	13%	64%	100%
Total	100%	100%			24%	13%	63%	100%
Total facilities	<u>15,194</u>	<u>18,290</u>						
D. Post-1992 entrants in 1996-1997 (facilities that were not present in 1992)		4a #	4b %	4c Deficiencies	4d Staffing			
Non-profit		891	31%	0.50	1.44			
For-profit		1,886	65%	0.69	1.03			
Government		131	5%	0.49	1.41			
Total		<u>2,908</u>	<u>100%</u>					

* Performance

- Deficiencies: No. of health deficiencies relative to 1991-1997 state average (lower value = higher quality)

- Staffing: No. of staff per resident (higher value = higher costs)

** Average per-diem rates in 1997 (Source: Gabrel, 2000, Table 8)

Medicare = \$ 215; Medicaid = \$98; Private-pay: Residential= \$97; Private-pay: Intermediate care = \$107; Private-pay: Skilled care = \$136

Table 2: Comparison of Quality (health deficiencies) and Staffing (staff/resident) at For-profit and Non-profit Facilities (OLS estimates) (positive coefficient = more deficiencies, more staff/resident)

	A. Deficiencies:						B. Staffing:					
	1a. All years			1b. 1996-1997			2a. All years			2b. 1996-1997		
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
Ownership: For-profit (a)	0.103	0.007	***	0.080	0.012	***	-0.107	0.003	***	-0.110	0.007	***
Ownership: Non-profit (a)	-0.068	0.007	***	-0.014	0.013		0.024	0.003	***	0.019	0.007	**
Ownership: Government (a)	-0.034	0.010	***	-0.066	0.017	***	0.084	0.004	***	0.091	0.009	***
Chain: Non-profit	0.078	0.017	***	0.048	0.027	#	-0.081	0.007	***	-0.053	0.015	***
Chain: For-profit	0.007	0.009		0.040	0.016	*	-0.017	0.004	***	0.005	0.009	
Chain size: Non-profit	-0.001	0.000	**	-0.001	0.000	#	-0.001	0.000	***	-0.001	0.000	***
Chain size: For-profit	-0.0003	0.000	***	-0.0001	0.000	*	-0.0001	0.000	***	-0.0001	0.000	***
Home size (beds)	0.001	0.000	***	0.001	0.000	***	-0.0004	0.000	***	-0.0003	0.000	***
Restraint prevalence	0.261	0.022	***	0.278	0.037	***	0.012	0.009		0.028	0.019	
Incontinence prevalence	-0.069	0.021	***	0.020	0.036		0.087	0.008	***	0.146	0.019	***
Anti-psychotic drug prevalence	0.010	0.021		-0.049	0.033		0.004	0.008		0.018	0.018	
Medicare proportion (v. private)	0.050	0.022	*	-0.057	0.037		1.159	0.009	***	1.178	0.020	***
Medicaid proportion (v. private)	0.520	0.017	***	0.281	0.031	***	-0.251	0.007	***	-0.290	0.017	***
Market concentration (county HHI)	-0.100	0.017	***	-0.063	0.029	*	-0.043	0.007	***	-0.039	0.015	**
Market size (county population)	0.000001	0.000	*	0.000001	0.000	#	-0.0000001	0.000		0.000001	0.000	*
Certificate of Need state	-0.043	0.008	***	0.043	0.013	**	-0.016	0.003	***	-0.017	0.007	*
Construction moratorium state	-0.014	0.011		-0.153	0.019	***	-0.034	0.005	***	-0.037	0.010	***
Year: 1991 (v. 1997)	0.554	0.015	***				0.053	0.006	***			
Year: 1992 (v. 1997)	0.476	0.014	***				0.042	0.006	***			
Year: 1993 (v. 1997)	0.482	0.014	***				0.044	0.006	***			
Year: 1994 (v. 1997)	0.392	0.014	***				0.061	0.006	***			
Year: 1995 (v. 1997)	0.215	0.014	***				0.022	0.006	***			
Year: 1996 (v. 1997)	0.058	0.013	***				0.005	0.005				
Post 1992 entrants: Non-profits				-0.001	0.030					0.018	0.016	
Post 1992 entrants: For-profits				-0.015	0.021					0.069	0.011	***
Intercept	0.208	0.024	***	0.339	0.037	***	1.091	0.010	***	1.051	0.020	***
Cases	99,901			18,074			99,901			18,074		
R-square	0.07			0.0471			0.33			0.4109		

(a) Mean effects dummy variables (coefficients sum to zero)

*** p<.001, ** p<.01, * p<.05, # p<.10 (two-tailed tests)

Table 3. Impact of For-profit and Non-profit Local Market Share on Quality and Efficiency of Nursing Homes, 1991-1997 (OLS)
 (positive coefficient = more deficiencies, more staff/resident)

	1a. Non-profit			1b. Non-profit			2a. For-profit			2b. For-profit		
	Deficiencies	s.e		Staffing	s.e		Deficiencies	s.e		Staffing	s.e	
For-profit independent share in county (a)	-0.134	0.037	***	0.148	0.020	***	-0.187	0.028	***	0.047	0.010	***
For-profit chain share in county (a)	-0.100	0.028	***	0.118	0.015	***	-0.078	0.027	**	0.060	0.010	***
Non-profit chain share in county (a)	-0.073	0.044	#	0.065	0.023	**	0.063	0.045		0.043	0.016	**
Chain: Non-profit	0.097	0.016	***	-0.091	0.009	***						
Chain: For-profit							-0.011	0.011		-0.033	0.004	***
Chain size: Non-profit	-0.001	0.000	***	-0.001	0.000	***						
Chain size: For-profit							-0.0004	0.000	***	-0.0001	0.000	***
Home size (beds)	0.001	0.000	***	-0.001	0.000	***	0.002	0.000	***	0.000	0.000	***
Restraint prevalence	0.361	0.037	***	-0.032	0.020		0.250	0.028	***	0.028	0.010	**
Incontinence prevalence	-0.085	0.037	*	0.080	0.020	***	-0.046	0.026	#	0.060	0.009	***
Anti-psychotic drug prevalence	0.067	0.038	#	0.023	0.020		0.009	0.026		0.011	0.009	
Medicare proportion (v. private)	0.019	0.030		0.936	0.016	***	0.071	0.035	*	1.412	0.013	***
Medicaid proportion (v. private)	0.398	0.027	***	-0.317	0.014	***	0.622	0.023	***	-0.219	0.008	***
Market concentration (county HHI)	0.102	0.033	**	-0.032	0.018	#	-0.204	0.023	***	-0.048	0.008	***
Market size (county population)	0.000	0.000		0.000	0.000		0.000	0.000	***	0.000	0.000	***
Certificate of need state	-0.037	0.014	**	-0.015	0.008	*	-0.046	0.010	***	-0.012	0.004	**
Construction moratorium state	-0.045	0.020	*	-0.052	0.011	***	-0.019	0.014		-0.024	0.005	***
Year: 1991 (v. 1997)	0.523	0.026	***	0.035	0.014	*	0.572	0.020	***	0.050	0.007	***
Year: 1992 (v. 1997)	0.403	0.025	***	0.019	0.013		0.485	0.018	***	0.051	0.007	***
Year: 1993 (v. 1997)	0.396	0.024	***	0.041	0.013	**	0.506	0.018	***	0.044	0.006	***
Year: 1994 (v. 1997)	0.319	0.024	***	0.062	0.013	***	0.413	0.018	***	0.055	0.006	***
Year: 1995 (v. 1997)	0.164	0.024	***	0.016	0.013		0.219	0.018	***	0.022	0.006	***
Year: 1996 (v. 1997)	0.062	0.023	**	-0.006	0.012		0.044	0.017	*	0.000	0.006	
Intercept	0.268	0.041	***	1.136	0.022	***	0.313	0.037	***	0.911	0.013	***
Cases	26,029			26,029			67,307			67,307		
R-square	0.07			0.33			0.06			0.29		

(a) Omitted case is share of non-profit independent facilities and government-owned facilities in county
 *** p<.001, ** p<.01, * p<.05, # p<.10 (two-tailed tests)

Table 4. Impact of Local Market Competition on Closure (1992-1995) and Acquisition (1992-1997) of Non-profits (logistic regression) (positive coefficient = facility is more likely to close or be acquired)

	Closures		Acquisitions															
	1		2	3		4a		4b		5								
	NFP	s.e	NFP	s.e	NFP by NFP	s.e	NFP by FP	s.e	NFP by FP	s.e.	All	s.e						
For-profit independent share (a)	0.45	0.54	0.87	0.30	**	2.27	0.38	***	-2.07	0.63	**		0.04	0.11				
For-profit chain share in county (a)	-0.51	0.52	1.31	0.26	***	2.08	0.35	***	0.51	0.42			1.41	0.11	***			
Government-owned facility share (a)	-0.63	0.70	0.58	0.32	#	3.24	0.46	***	-1.65	0.49	***		0.77	0.14	***			
Non-profit chain share in county (a)	0.82	0.60	2.80	0.24	***	5.32	0.36	***	-1.84	0.65	**	-1.26	0.70	#	1.33	0.15	***	
Non-profit independent share												0.77	0.38	***				
Ownership: Non-profit (b)															0.13	0.06	*	
Ownership: For-profit (b)															1.14	0.06	***	
Ownership: Government (b)															-1.27	0.32	***	
Deficiencies at facility	0.16	0.07	*	0.12	0.03		0.13	0.04	***	0.09	0.06		0.09	0.06	0.09	0.01	***	
Staff intensity at facility	0.68	0.10	***	-0.46	0.12	***	-0.30	0.13	*	-0.95	0.25	***	-1.01	0.25	***	-0.09	0.05	#
Facility is part of chain	0.12	0.21		-0.68	0.11	***	-1.66	0.17	***	0.58	0.18	**	0.87	0.17	***	-0.37	0.03	***
Home size (beds)	-0.004	0.00	**	-0.001	0.00	***	-0.0005	0.00		-0.002	0.00	#	-0.002	0.00	*	0.0004	0.00	
Restraint prevalence	-0.37	0.53		0.19	0.25	#	0.17	0.30		0.27	0.48		0.23	0.47		0.22	0.09	*
Incontinence prevalence	-0.67	0.48		0.01	0.24		-0.17	0.27		0.67	0.47		0.50	0.46		-0.21	0.09	*
Anti-psychotic drug prevalence	-0.56	0.51		-0.26	0.24		-0.45	0.28		0.32	0.48		0.23	0.48		-0.28	0.09	**
Medicare proportion (v. private)	0.29	0.42		0.98	0.19		0.81	0.21	***	1.67	0.43	***	1.53	0.43	***	0.88	0.09	***
Medicaid proportion (v. private)	1.59	0.39	***	0.47	0.19	***	-0.01	0.22		1.91	0.42	***	1.69	0.41	***	0.08	0.08	
Market concentration (county HHI)	-1.17	0.60	*	-0.76	0.26	*	-1.40	0.35	***	-1.72	0.50	***	-0.92	0.41	*	-0.37	0.07	***
Market size (county population)	0.00	0.00		0.000005	0.00	**	-0.00001	0.00	#	0.00	0.00		0.00	0.00		0.00001	0.00	***
Certificate of need state	0.15	0.20		-0.18	0.10		-0.19	0.11	#	-0.12	0.20		-0.24	0.19		-0.18	0.03	***
Construction moratorium state	-0.45	0.35		0.26	0.12	#	0.02	0.15		0.54	0.22	*	0.62	0.22	**	0.05	0.05	
Year: 1991 (c)	-1.38	0.30	***	1.33	1.07	*	1.75	1.07			0.81	0.41	*
Year: 1992	-1.20	0.26	***	0.50	0.16		0.38	0.19	*	0.62	0.34	#	1.03	0.34	**	0.15	0.07	*
Year: 1993	-1.85	0.32	***	0.23	0.16	**	-0.04	0.19		0.73	0.31	*	0.94	0.30	**	-0.10	0.06	
Year: 1994	-0.98	0.23	***	-0.25	0.17		-0.23	0.20		-0.45	0.36		-0.22	0.36		-0.08	0.06	
Year: 1995				-0.19	0.17		-0.21	0.20		-0.16	0.34		0.08	0.34		0.19	0.06	**
Year: 1996				0.17	0.16		0.11	0.18		0.25	0.31		0.57	0.30	#	0.23	0.06	***
Intercept	-4.86	0.60	***	-4.18	0.32	***	-4.93	0.38	***	-5.61	0.62	***	-6.20	0.60	***	-4.17	0.15	***
Cases	18,663	(142)		21,461	(657)		21,461	(486)		21,461	(171)		21,461	(171)		82,210	(5,081)	
No-covariate loglikelihood chi	1,668			5,874.7			4,643			1,993			1,993			38,130		
Model loglikelihood chi	1,532			5,547.1			4,165			1,806			1,857			35,911		
Model loglikelihood ratio (df)	136	(21)		327.6	(23)		477	(23)		187	(23)		136	(21)		2,219	(25)	

(a) Omitted case is share of non-profit independent facilities in county

(b) Mean effects dummy variables (coefficients sum to zero)

(c) Years compared to 1997 for acquisitions models and 1995 for closure models

Table 5. Impact of Acquisition on Change in Quality and Staffing at Non-profit Facilities (OLS)
 (positive coefficient = greater increase in deficiencies, greater increase in staff/resident)

	1			2		
	1-period change: Deficiencies			1-period change: Staffing		
	Coef.	s.e.		Coef.	s.e.	
Non-profit acquired by for-profit chain: 1 period ago	0.270	0.069	***	-0.047	0.024	#
Non-profit acquired by for-profit chain: 2 periods ago	0.169	0.074	*	-0.015	0.026	
Non-profit acquired by non-profit chain: 1 period ago	0.054	0.041		0.007	0.014	
Non-profit acquired by non-profit chain: 2 periods ago	0.049	0.051		-0.021	0.018	
For-profit independent share in county	-0.094	0.041	*	0.002	0.014	
For-profit chain share in county	-0.103	0.029	***	-0.006	0.010	
Non-profit chain share in county	-0.014	0.042		0.019	0.015	
Prior deficiencies at facility	-0.773	0.006	***	-0.001	0.002	
Prior staff intensity at facility	-0.097	0.018	***	-0.453	0.006	***
Facility is part of chain	0.032	0.016	*	-0.039	0.005	***
Home size (beds)	0.001	0.000	***	-0.001	0.000	***
Restraint prevalence	0.164	0.038	***	0.007	0.013	
Incontinence prevalence	-0.070	0.037	#	0.052	0.013	***
Anti-psychotic drug prevalence	-0.008	0.038		0.010	0.013	
Medicare proportion (v. private)	0.013	0.030		0.141	0.010	***
Medicaid proportion (v. private)	0.248	0.028	***	-0.035	0.010	***
Market concentration (county HHI)	0.065	0.032	*	-0.058	0.011	***
Market size (county population)	0.000001	0.000		0.0000005	0.000	**
Construction moratorium state	-0.047	0.021	*	-0.009	0.007	
Year: 1991 (v. 1997)	1.159	0.258	***	0.016	0.090	
Year: 1992 (v. 1997)	0.347	0.025	***	-0.031	0.009	***
Year: 1993 (v. 1997)	0.335	0.023	***	0.013	0.008	
Year: 1994 (v. 1997)	0.263	0.023	***	0.026	0.008	**
Year: 1995 (v. 1997)	0.127	0.023	***	-0.011	0.008	
Year: 1996 (v. 1997)	0.054	0.022	*	-0.016	0.008	*
Intercept	0.3479	0.04408	***	0.47707	0.01529	***
R-square	0.43			0.21		
Cases: Non-profits at risk of acquisition (661 acquisitions) (172 acquisitions by for-profits, 489 by non-profits)	21,423			21,423		

*** p<.001, ** p<.01, * p<.05, # p<.10 (two-tailed tests)

Table 6. Impact of For-profit Share in Local Markets on Change in Non-profit Quality and Staffing at Surviving Facilities, 1992-1997 (OLS)

(positive coefficient = greater increase in deficiencies, greater increase in staff/resident between 1992-1993 & 1996-1997)

	1a. Deficiencies			1b. Staffing			2a. Deficiencies			2b. Staffing		
	NFP		Coef.	NFP		Coef.	FP		Coef.	FP		Coef.
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
For-profit independent share in county (a)	-0.13	0.06	*	0.86	0.40	*	-0.19	0.05	***	-0.01	0.25	
For-profit chain share in county (a)	-0.16	0.06	**	1.19	0.44	**	-0.11	0.06	#	0.25	0.29	
Government-owned facility share (a)	-0.23	0.10	*	1.70	0.75	*	-0.15	0.09	#	-0.04	0.45	
Non-profit chain share in county (a)	0.02	0.19		2.84	1.37	*	0.39	0.14	**	-0.34	0.70	
Prior deficiencies	-0.91	0.01	***	-0.15	0.09	#	-0.85	0.01	***	-0.03	0.04	
Prior staff intensity	0.00	0.00		-0.97	0.01	***	0.00	0.00		-0.67	0.01	
Facility is part of chain	0.08	0.06		-0.01	0.42		0.02	0.03		0.12	0.14	
Home size (beds)	0.00	0.00	***	0.00	0.00	*	0.00	0.00	***	0.00	0.00	
Restraint prevalence	0.08	0.08		-0.78	0.55		0.07	0.05		0.24	0.26	
Incontinence prevalence	-0.08	0.07		-0.27	0.48		-0.04	0.05		-0.03	0.23	
Anti-psychotic drug prevalence	-0.06	0.07		-0.44	0.51		-0.08	0.04	#	0.00	0.22	
Medicare proportion (v. private)	-0.06	0.06		-0.12	0.40		-0.12	0.07	#	1.31	0.33	
Medicaid proportion (v. private)	0.16	0.05	***	-1.00	0.34	**	0.15	0.04	***	-0.66	0.18	
Market concentration (county HHI)	-0.28	0.56		-1.06	4.07		-0.72	0.30	*	-3.20	1.52	
Market size (county population)	0.00	0.00		0.00	0.00		0.00	0.00	***	0.00	0.00	
Certificate of need state	0.03	0.03		-0.73	0.20	***	0.11	0.02	***	-0.19	0.10	
Construction moratorium state	-0.2137	0	***	-0.68	0.29	*	-0.14	0.03	***	-0.29	0.14	
Intercept	0.53	0.13	***	2.83	0.97	**	0.63	0.09	***	2.03	0.44	
R-square	0.61			0.69			0.56			0.40		
Cases (facilities operating in 1992-1993 & 1996-1997)	3,845			3,845			9,917			9,917		

(a) Omitted case is share of non-profit independent facilities in county

*** p<.001, ** p<.01, * p<.05, # p<.10 (two-tailed tests)

Appendix 1. Descriptive statistics (100,571 cases)

<i>Variable</i>	Mean	s.d.	Minimum	Maximum
Facility characteristics				
Home size (beds)	107.3	69.7	4	919
Staff intensity at facility	1.0	0.5	0.2	5.0
Deficiencies at facility (state-weighted)	1.0	1.1	0.0	20.0
Anti-psychotic drug prevalence	0.4	0.2	0	1
Restraint prevalence	0.2	0.2	0	1
Incontinence prevalence	0.5	0.2	0	1
Ownership: Government	0.1	0.2	0	1
Ownership: Non-profit	0.3	0.4	0	1
Ownership: For-profit	0.7	0.5	0	1
Medicaid proportion	0.6	0.3	0	1
Medicare proportion	0.1	0.2	0	1
Facility is part of chain	0.4	0.5	0	1
Chain: Non-profit	0.1	0.2	0	1
Chain: For-profit	0.3	0.5	0	1
Chain characteristics				
Chain size (facilities): Non-profit	0.2	1.4	0	37
Chain size (facilities): For-profit	41.3	143.2	0	823
Market characteristics				
For-profit chain share in county	0.4	0.3	0	1
For-profit independent share in county	0.3	0.3	0	1
Non-profit chain share in county	0.1	0.1	0	1
Government-owned share in county	0.04	0.2	0	1
Non-profit independent share in county	0.2	0.2	0	1
Market concentration (county HHI)	0.2	0.2	0	1
Market size (county population, 000)	5,526	12,910	0	70,320
Certificate of Need state	0.6	0.5	0	1
Construction moratorium state	0.1	0.3	0	1
Year				
Year: 1991	0.1	0.3	0	1
Year: 1992	0.2	0.4	0	1
Year: 1993	0.2	0.4	0	1
Year: 1994	0.2	0.4	0	1
Year: 1995	0.1	0.3	0	1
Year: 1996	0.2	0.4	0	1
Year: 1997	0.1	0.3	0	1