

**Structure, Behavior and Performance in
For-Profit, Nonprofit and Government Organizations:
An Empirical Investigation***

Avner Ben-Ner and Ting Ren**

Work in progress - very preliminary draft, December 30, 2006

I. Introduction

Does organization type matter? The comparative performance of different types of organization has attracted substantial scholarly attention. A large literature shows that performance varies across types of organization: private firms generally outperform government-owned firms (e.g., Megginson and Netter, 2001), but comparisons between these types of organization and nonprofit organizations are more complicated and depend (at least in the health care industry where most of the comparative empirical work has concentrated) on the specific measures of outcomes used in the analysis (see, e.g., Horowitz, 2005).

Different types of organization are differentiated along several dimensions. First, they differ in who holds ownership rights. Three types of organization are examined in this paper: *for-profit firms*, *nonprofit organizations*, and *government organizations*. Ultimate control is vested in owners if for-profit firms, boards of directors in nonprofit organizations, and politicians in

* The Aspen Institute generously funded this research.

** Ben-Ner and Ren are a professor and a doctoral student, respectively, at the Industrial Relations Center, Carlson School of Management, University of Minnesota. Email: abenner@csm.umn.edu and tren@csom.umn.edu.

charge of government agencies in the case of government-owned organizations. These differences presumably translate into different organizational objectives: profit in for-profit firms, and some goals other than profit in nonprofit and government organizations. The way this works is through the explicit choice of formation of organizations that incorporate not in order to make profits for their owners but to pursue objectives that allegedly are not met well enough by for-profit firms. Furthermore, the ownership structure is likely to generate different agency relations and different attendant agency problems. Finally, the employees of different types of organization may self-select to these organizations according to the fit between their personal goals and organizational objectives.

These differences are likely to translate into different outcomes and performance. For-profit firms are likely to emphasize profits, subject to law, regulations and owners' and operators' ethical constraints. Nonprofit and government organizations are likely to focus on objectives that correct for for-profit firms' perceived failures, reflecting the views and interests of the groups that sponsor them. Given the ownership structure of nonprofit and government organizations, there will be no individuals with deep financial interests as in for-profit firms, hence agency considerations suggest that for-profit firms will be more efficient than nonprofit and government organizations in pursuing their respective objectives. Nonprofit and government organizations may draw workers and managers who believe in providing products that reflect public needs, or at least broader needs, than those reflected in for-profit provision. Such motivation may help compensate for some or all of the difference in the gravity of agency problems nonprofit and government organizations encounter relative to for-profit firms.

Organizational objectives, agency problems, and self selection of workers and managers affect organizational outcomes and performance through organization structure and behavior. Those who control an organization will seek to incorporate in it *organization structure* elements – allocation of decision-making, incentives, monitoring, allocation of tasks, selection of workers, and so on – so as to maximize the likelihood that workers and managers will pursue the organization’s objectives rather than their own personal goals. Organization structure affects the *organizational behavior* of workers and managers in terms of their effort, the decisions they make, the information they share, and so on, finally turning into various *organizational outcomes and performance*.

In this paper we examine empirically the association between organization type on the one hand and organization structure, organizational behavior, and organizational performance on the other hand, focusing on different types of organization that coexist in the same industry. We consider for-profit, nonprofit and government nursing homes (of the skilled facility variety), and focus on a single region, the state of Minnesota, to exclude influences associated with geographic heterogeneity detected in many studies (e.g., Bloom and van Reenen, 2006), as well as to control for the legal and regulatory, including enforcement, environment, which varies considerably across states. The paper is unique in its examination of the chain of associations extending from organization type to structure, behavior and performance. It investigates more than one hundred nursing homes, the nearly one-third of all nursing homes in Minnesota that responded to our survey. The survey data are merged with state and federal data regarding various aspects of the operation of nursing homes.

In section II of the paper we develop a conceptual framework for the analysis of the relationship between organization type, organization structure, organization behavior, and organizational outcomes and performance on the basis of the different roles the three types of organization play in the mixed economy. In section III we describe our empirical investigation. Section IV concludes, attempting to interpret the empirical results regarding Minnesota nursing homes in light of our theoretical framework.

II. A Theoretical Framework for the Investigation of Organizational Type, Structure, Behavior and Performance

We start with a general and abstract analysis of the reasons for the coexistence of different types of organization in order to supply the background for an examination of differences in structure, behavior and performance. Narrowing our focus to for-profit, nonprofit and government organizations, we then proceed to analyze the ways in which outcomes and performance are likely to differ across types of organization, relating these differences to organizational objectives, agency problems, and worker self selection. We argue that these differences are reflected through a chain that leads from organization type to organization structure to organization behavior and finally to organization performance. Next we analyze briefly competitive, mimetic and regulatory pressures for similarities among organizations, especially those that were established in the past under circumstances that may have changed. Although the discussion is framed in general terms, we restrict its scope with the goal of informing specifically our comparative empirical investigation of for-profit, nonprofit and government nursing homes.

(a) Why is there a mixed organizational economy?

In a perfectly competitive market there are no reasons for substituting or complementing for-profit firms with other types of organization. No consumers, workers or others could gain welfare in a Pareto-optimal fashion through rearrangement of roles, as Tjalling Koopmans had shown half a century ago (1957). Although the sole inhabitant of the island, Robinson Crusoe should organize production and consumption as three separate individuals, one as a firm maximizing profit given prices, the other as a utility maximizing consumer taking prices as given, and the other as a utility maximizing worker. This result (the theorem of separating hyperplanes) holds when the standard assumptions of perfect competition hold: no market power, symmetric information, rivalry, excludability, anonymity, and no externalities.

The Koopmans result applies to relations between the firm as profit-maximizing entity and its customers and suppliers, including workers.¹ When one or more of these conditions are violated (i.e., there are some market failures), room opens for alternatives to the for-profit firm. The alternatives come in various forms, depending on the nature of the market failure. If the failure is internal to the firm, occurring between the firm, identified with owners of the capital, and its workers, then the corrective is a workers' cooperative. If the failure is between the firm and consumers, the corrective is a form of consumer-oriented organization such as a consumer cooperative or a nonprofit organization. Some failures can be addressed through government regulation of for-profit provision, whereas other failures require a government corrective in provision.

¹ Dreze and Hagen (1978) show that the relations between the firm and consumers and the relations between the firm and workers are formally equivalent.

Alternative types of organization will arise if their added benefits exceed their added costs (if any). The cost of operation of different alternatives varies with factors that Koopmans did not consider. There are several types of costs that vary with organization type: the cost of entrepreneurship, the cost of raising capital and the cost of obtaining the cooperation of workers and managers in the pursuit of organizational objectives (the agency problem). Some of these cost differentials may be quite large so that not all instances of violations of market or internal organization conditions for perfect competition will invite correction in the form of an alternative type of organization.²

(b) Why would performance vary across types of organization?

Organizational performance depends on organizational objectives, effectiveness of elicitation of worker effort directed at these objectives, and the kind of workers that join an organization. Conceptually, organization objectives can be deduced from the identity of those who help found and later control an organization. In the case of for-profit firms, founders and later controllers are equity owners who seek the best returns on their investments, mostly of financial nature, suggesting the goal of profit maximization. In the case of nonprofit organizations, the founders and controllers may be consumers (or others who care about them) who feel that for-profit provision is unsatisfactory, given economic constraints. For example, in Rochdale, England local stores were suspected of selling adulterated foodstuff (milk with added water, flour with added aluminum to whiten it or potatoes with even limestone to bulk it up, etc.), exploiting the fact that

² See Weisbrod (1988), Ben-Ner (1988 and 2006), Ben-Ner and Van Hoomissen (1991) and Hansmann (1996) for related organizational cost-benefit analyses. Little of this would matter if different types of organization were founded for essentially non-economic reasons, and if they were supported by resources generated outside these organizations. This is not the case in market economies, although preferential treatment is given to various types of organization, including nonprofit organizations; a discussion of this issue is beyond the scope of this paper.

it was not easily discernable from unadulterated foodstuff, and this being England in the first half of the nineteenth century, government regulation was not very effective at regulating provision of foodstuff and at reducing asymmetric information between sellers and buyers. After a few unsuccessful attempts (due to insufficient capital, free ridership and other organizational problems), the Rochdale Society of Equitable Pioneers was founded by local residents in 1844 essentially as a nonprofit organization aimed at providing unadulterated foodstuff at the lowest possible prices. Other organizations, such as cultural associations, religious groups, foundations and local government may help establish organizations with the purpose of providing products in ways that compensate for market failures experienced in provision by for-profit firms (including the case when for-profit firms do not exist at all because of the magnitude of market failures). Other groups may seek to correct problems with access to public goods associated with the possibility of excludability, by providing a service such as library or a park at a low or no cost; in this case again the beneficiaries are a different group from the benefactors who help found, control and fund the provision of the service. Religious groups will emphasize the provision of local public goods to their co-religionist by supplying a religious environment. Government organizations will, often by law, provide services with universal access and additional goals associated with different citizen and lobby groups.³

Jensen and Meckling (1976) suggested that founders and controllers of nonprofit and government organizations are less effective principals than their for-profit counterparts because they do not have financial stakes in these organizations. They predict that agency problems will be more severe in nonprofit and government organizations than in for-profit firms, with

³ For additional examples as well as considerations of circumstances when government versus private groups will engage in provision, see Ben-Ner and Van Hoomissen (1991).

consequences for lower efficiency. This is a simple and powerful argument: members of board of directors of nonprofit organizations, executives and administrators do not have ownership rights; hence they will have lesser incentives than owners of for-profit firms and their executives who also own shares. The problem with government organizations may be even more severe. The problem is that managers will invest less effort in planning, design of strategy, ensuring that workers do their best to advance organizational objectives, and other managerial duties. Furthermore, the objectives of nonprofit and government organizations are more complex and more difficult to formulate and to articulate than the single and quantitatively simple measure of profit.⁴ This adds to the severity of the agency problem. Hence nonprofit and government organizations will be less-well managed than for-profit firms.

Self selection by workers and managers may solve some of the agency problem of nonprofit and government organizations in that some of these will be drawn to work in what they regard more ethical organizations, and organizations that do not exploit asymmetric information and or other disadvantages from which consumers may suffer.⁵ Such workers and managers may work harder than their incentives alone would induce them, compensating for some or the entire agency problem discussed in the previous paragraph.

The foregoing discussion leads to certain expectations for the nature of organizational outcomes and performance in the three types of organization. Before describing these expectations it is necessary to identify four key dimensions of products provided by an organization. First, there is the *quantity* of the product (e.g., the number of residents served by a nursing home). Second,

⁴ Alternative goals are adopted because these organizations eschew profit maximization to overcome market failures.

⁵ This is a common argument advanced by workers and managers in the nonprofit sector and to a lesser extent in government.

there is the *observable quality* of the product (for example, in a nursing home this concerns the size of residents' rooms, the quality of food, the appearance of facilities, the ratio of nursing staff to residents, and so on). Third, there is the *unobservable quality*, the element of the product that is subject to *asymmetric information* between seller and buyer (in a nursing home, the informational gap between the provider and residents who are partially incapacitated and have limited ability to communicate their needs and the treatment they receive to members of their family who are not in a position to evaluate the needed and received care). Fourth, there is the '*relational*' or *affective* aspect, particularly in personal services (for example, in nursing homes this concerns the degree of personal concern exhibited by the staff and the emotional connection they make with residents); this dimension may also be affected by asymmetric information.

Differences in the performance of different types of organization should be manifested in the difficult-to-observe by outsiders (third and fourth) dimensions, with for-profit firms providing less than nonprofit and government organizations. In the observable quality dimension the differences will depend on economic demand (this may be correlated with the choice of the organization to patronize, so that those with greater demand for quality may also be more aware of asymmetric information problems and therefore opt for nonprofit or government provision, providing a confounding effect). A further effect will arise from the agency problem and workers' self selection, reducing the advantages of nonprofit and government organizations in the asymmetric information and relational dimensions (but not below for-profit firms because they will lose their customers) and show less efficiency in the quantitative dimension.

(c) Organization type, organization structure and organizational behavior

Differences in objectives, agency problems and self selection do not translate directly into performance. Organizations adopt various measures to deal with the agency problems they face and to capitalize on self selection advantages in order to enhance the accomplishment of their objectives. These measures are captured by organization structure, including the extent of delegation, if any, of decision-making to workers, provision of incentives, monitoring of effort and output, selection of new workers, assignment of workers to various tasks, and more (Ben-Ner, Montias and Neuberger, 1993).⁶ In general, we expect nonprofit and government organizations to rely less on financial incentives because their complex objectives do not permit a simple incentive scheme (akin to the problem of incentives in multi-tasking situations), and will rely instead on general evaluation of performance and monitoring than for-profit firms.⁷ Nonprofit and government organizations are more likely to delegate decisions to workers, especially to their key workers, as an expression of the vacuum created by less involved principals (Pauly and Redisch, 1973, and Glaser, 2003), and as a way to allow dedicated workers to influence decisions in ways that are consonant with their beliefs about the mission of their organizations. Furthermore, if personal attention and affective relations are important objectives, then delegation to line workers is required because these sort of relations have to be managed by those who engage in them directly. These organizations will also seek to hire such workers by

⁶ Some elements of organization structure are complementary to each other whereas others are substitutable for each other. Incentives complement delegated decision-making to direct it towards the goals of the organization. Monitoring of input may be complementary to delegation, to ensure that decisions are indeed directed towards organizational goals. Incentives and monitoring are thus in a substitutable relationship, which depends on their relative costs and benefits. In the empirical work we present later in the paper we do not capture these complex relationships among different elements of organization structure because of data limitations; for a more ambitious effort focusing on for-profit firms in diverse industries, see Ben-Ner, Kong and Lluís (2006).

⁷ Due to the complementary effect of incentives and monitoring to allocation of decision-making, we do not compare directly the two elements across organization types.

exploiting the social networks of current employees for referrals of like-minded job candidates.⁸ Staffing will reflect organizational objectives; emphasis on quantity likely calls for lower skills than emphasis on quality or personally attention.

Organizational structure affects the behavior of workers and managers of an organization: how hard they work, where they invest their efforts, how well they collaborate with each other, how much information they share, and so on. Opportunities for influence on decision-making through delegation, if combined with appropriate motivation and professional competence, open the possibility for workers to have direct input on how to discharge their duties in the best way to accomplish organizational objectives. If this combination is absent, delegation and influence may be abused, being used to advance the interests of workers rather than the objectives of the organization. Thus differences in the behavior of various employees depend on the organizational structure, which is in turn determined by the organization's type. Organizational outcomes and performance are determined in turn by the behavior of various types of employees, from top executives to line employees.

(d) Competitive, mimetic and regulatory pressures for similarities across organizations

The factors associated with organizational type tend to generate differences in structure, behavior and performance. However, there are other factors that militate against differences among organizations. Competition will force organizations to provide relatively similar combinations of product dimensions of interest to consumers (Steinberg, 1987). In the extreme case that consumers do not use organizational type as a signal for desirability of provision of unobservable

⁸ Seeking explicitly job candidates who agree with the social mission of an organization is unlikely to discern appropriately the dedicated from the mere job seekers. Current employees may know their acquaintances' predilections in ways that screening by human resources staff cannot replicate.

elements of the product (because they are not aware of the problem of asymmetric information, for example), even organizations that do not want to take advantage of asymmetric information would be forced to do so, because if they do not they would have to subsidize the provision of the unobservable elements from other sources.⁹ Another force for similarity consists of the myriad ways through which professional workers learn from each other and their organizations how and what to do in their roles, conforming to accepted best organizational or professional practices. Regulation of professional and organizational practices is another related factor that drives similarity (DiMaggio and Powell, 1983). In some areas, such as nursing homes, various federal, state and local agencies seek to establish and enforce uniform practices and minimum standards of care.

In addition to the forces mentioned above, similarity may arise from broad economic, technological and other developments that reduce the demand for alternative types of organization. Whereas historically specific conditions (various market failures) would have given rise to different types of organization, such conditions may have changed with increased availability of information, competition, regulation, and other factors that weaken the need for different organizational structures and performance (Ben-Ner, 2002). For various reasons, organizations may outlive the need for them, so that the boundaries among different existing organizations may be eroded in some industries.

III. Empirical Investigation of Structure, Behavior and Performance in Relation to Organizational Type

⁹ This is, of course, a typical Akerlof-type “lemons” problem (Akerlof, 1970) whereby bad products squeeze out good products.

a) The dataset and variables

The study focuses on nursing homes in Minnesota. The single industry-single state focus confers the advantage of minimization of unobserved heterogeneity in industry characteristics and factors such as regulations and state laws as well as their enforcement, cultural practices, social norms, and many others. In addition, this focus permits the assembly of a uniquely detailed dataset, culled from a survey administered to executives in individual organizations and from various state sources that may be impossible to collect from multiple states. Furthermore, nursing homes are generally small organizations, so that the information reflects the circumstances of homogeneous organizations, in contrast with the diverse circumstances of larger organizations where practices may differ considerably across sites, departments and other units.

A nursing home is a residence for elderly who have physical or mental problems that prevent them from living on their own. A nursing home provides residents a room, meals and assistance with daily activities as well as medical care that does not rise to the intensive care provided by a hospital. The average nursing home in the US has about 100 beds, with a range of approximately 25 to 500 beds. Most nursing homes operate independently and separately from hospitals, but nearly a tenth of them are affiliated with a hospital. Some nursing homes specialize in different types of care or medical conditions, but the majority of homes have residents with diverse medical conditions and ages. Nursing homes are operated as for-profit firm, nonprofit organizations and as government-owned organizations, and may be part of a chain or independent facilities. Nursing homes are subject to state health regulations and to federal

Centers for Medicare and Medicaid regulations¹⁰ that prescribe certain minimum practices concerning care, housing, food and other aspects of nursing home living as well as collect information about residents, staff, quality of care and other matters, and perform unannounced inspections to ensure compliance with regulation. This network of regulations, inspections, data collection and dissemination and other means are required because residents are typically frail and vulnerable individuals who enter a nursing home under the duress of a medical event that necessitates removal from their own homes. Nursing home residents and their families are commonly in a position of disadvantage because, for reasons of limited capacity (residents) and distance (families), asymmetric information favors the providers of nursing home care. To give an extreme example, residents cannot object effectively to being medicated with sedatives in order to make them more pliant or being put to bed early, and families are not present outside infrequent visits to be able to observe the substantive care their elderly receive, thus being reduced to observe only facilities and other factors that may have only little to do with the nature and quality of care.

The data are drawn from the following sources: (1) Minnesota Nursing Homes Employer Survey – Structure and Behavior (MNHES), (2) Online Survey, Certification, and Reporting database of the federal Centers for Medicare & Medicaid Services (OSCAR), (3) Minnesota Department of Human Services (DHS), and (4) Minnesota Department of Employment and Economic Development (DEED). We also obtained 2000 U.S. Census data about each nursing home's zip code area.

¹⁰ Practically all nursing homes have residents who benefit from the federal Medicare and Medicaid programs (benefiting the elderly and the poor, respectively); hence they are all subject to these regulations.

The survey was administered in late 2005 with follow-up surveys to non-respondents mailed again twice in the spring of 2006, to all 409 nursing homes identified in the OSCAR database. The response rate is about 30%, with 120 nursing homes responding. One state-owned nursing home was eliminated in order to retain only local-government owned homes, and because the eliminated home was a unique home (mental health problems). Therefore, the size of the final sample is 119. The survey¹¹ was addressed to nursing home administrators (listed in the OSCAR database). It requested information regarding various aspects of the structure, behavior and performance of the homes supplied by administrators (single respondents), concerning ownership, residents, revenues, comparison with other nursing homes, wages of nursing staff, workload of employees, human resource practices, attitudes of nursing employees, participation in decision-making on various issues by diverse groups, and more. OSCAR data provide information about nursing home capacity, nursing inputs, violation of regulations, health condition of residents, and more. DHS data provide information about nursing home quality, resident satisfaction, and level of case-mix. DEED data regard employment and wages as well as some employment dynamics. U.S. census data provide demographic information of the zip code area where the nursing home is located, including degree of urbanization, income level, racial, gender, and age composition of the local population.

We now turn to a brief description of the key variables that are employed in the estimations of structure and performance. Additional variables are discussed in conjunction with Table 1.

Delegation of decision-making. We used two variables to measure this concept: core employee (nurses) *influence on strategic decision-making* and core employee *influence on non-strategic*

¹¹ The survey is at <http://webpages.csom.umn.edu/hrir/abenner/web/papers/work-surv/Nursing-homes-survey.pdf>.

decision-making. The variable of employee's influence on decision making was calculated from information about the degree of influence employees have on eight areas in a nursing home's decision making, with possible answers ranging from 1 (*not at all*) to 5 (*extreme*) for each item. The eight decision-making items included in the survey were: hiring of registered nurses/licensed practicing nurses/certified nursing assistants, hiring of executive director or similar, determination of fees for non-Medicare/Medicaid residents,¹² expansion of facilities, change in the services offered, menu planning, choosing of activities for residents, and determination of standards of care of residents. Of the seven decision-making items we defined four items as strategic decision-making in nursing homes: hiring of executive director or similar position, expansion of facilities, change in the services offered, and determination of standards for care of residents. The other three items are defined as non-strategic decision-making.

Incentives. In nursing homes, nurses work in teams so that the individual contribution to overall quality of care is impossible to observe and measure, hence standard pay-for-performance incentives cannot be used. (This is also evident from nursing homes' response to our open-ended survey question). To help align employees' effort with organizational goals nursing homes that seek to use incentives tend to rely on merit-based pay raises. In the nursing home survey we asked whether merit is a determinant to individual employee's pay raise. We also asked nursing homes whether they provide fringe benefits such as pension plans, health insurance, paid vacation leave and paid sick leave. This variable is coded as a count of items implemented with a range from 1 to 4. We do not have measures for job-related perquisites.

¹² Due to the fact that nursing home fee is usually mandated by state regulatory agency while not nurses, we drop this item from decision-making participation items.

Monitoring. The variable of level of monitoring came from a single item in the survey asking organizations to evaluate to what extent the employees (registered nurses, licensed practical nurses, and nursing assistants) have their work monitored and supervised by supervisors and managers. The scale of this single item ranges from 1 (*not at all*) to 5 (*extreme*).

Staffing. We use the ratio of nursing staff to residents.

Selection. Whether using network as a recruiting method is the measure of selection. In the nursing home survey we asked what kinds of recruiting methods they had used, including cold call by candidate, newspaper ad, online job service, referral by a current employee, employment agency, on-site posting, and so on. We considered the method of referral by a current employee indicated whether the employees were selected into nursing homes of specific ownership status by the fit of personal and organizational preferences.

Organizational performance. The four dimensions of organizational performance in nursing home industry, i.e., quantity, observable quality, asymmetric information element (unobservable quality) and the relational element, are measured by four different variables: number of residents, deficiency citations from regulatory inspections, proportion of residents having back pressure sores, and resident satisfaction with the quality of life in the nursing home.

A production function of a nursing home's quantitative output, number of residents served, is used to capture the quantitative dimension of service provided in nursing homes. This measure also provides additional insight into possible differences in organizational efficiency. In the

production function we examine the relationship between the number of residents served by a nursing home as a measure of its output and the number of employees in the key nursing staff groups as the input, as well as control variables. This is a synthetic measure that focuses on efficient production of quantity, but obviously ignores other important dimensions such as quality that may be in competition with quantity.

The deficiency citations variable comes from the state regulatory body that conducts routine surprise inspections of licensed nursing homes. This measure captures the quality of service dimension of service. There are over 150 regulatory standards that nursing homes must meet at all times, covering a wide range of aspects of resident life from standards for the safe storage and preparation of food to protection of residents from physical or mental abuse and inadequate care practices. When an inspection team finds that a home does not meet a specific regulation, it issues a deficiency citation. In our sample most homes (92 of 119) were found in 2005 to be free of deficiencies, with the remaining 27 homes received one or more citations, with a maximum of 13 citations.¹³

The proportion of residents having back pressure sores is among the data that nursing homes are required to collect on all residents at specific intervals during their stay. In nursing home settings pressure sores typically occur because immobile resident remain for a long time in the same position in bed, chair or wheelchair, because of improper nutrition, and because the deficiency of

¹³ Examples of violations include failure to: “provide enough notice before discharging or transferring a resident,” “give each resident care and services to get or keep the highest quality of life,” “prepare food that is nutritional, appetizing, tasty, attractive, well-cooked...,” “provide clean bed and bath linens that are in good condition,” “protect each resident from all abuse, physical punishment...,” “provide care in a way that keeps or builds each resident's dignity and self respect,” “give each resident care and services to get or keep the highest quality of life,” “use a registered nurse at least 8 hours a day, 7 days a week,” and so on.

preventive care such as using soft padding provided to the elderly residents. The number or proportion of residents with pressure sores is often used in the literature as an indicator of nursing home quality that is unobservable to family members who are the decision makers on behalf of many residents, particularly the immobile ones (e.g., Cawley, Grabowski and Hirth, 2004; Grabowski and Hirth, 2002). Hence pressure sores reflect the asymmetric information dimension of performance. There are three types of pressure sores reported by nursing homes: high-risk long-stay residents who have pressure sores, low-risk long-stay residents who have pressure sores and short-stay residents with pressure sores. Due to the fact that the population of each group of residents is unknown to us, we add up the three groups to gain the overall representation of the prevalence of pressure sores in a specific nursing home. However, the distribution of this indicator is skewed in that only 21 homes report having pressure sores, with rates ranging from 1% to 20%.

The resident satisfaction rating was obtained through interviews that were conducted by an independent contractor of the regulatory agency with a sample of residents in each nursing home. The final score was aggregated from a variety of resident satisfaction and perception of quality of life measures, including comfort, environmental adaptations, privacy, dignity, spiritual well-being, meaningful activity, food enjoyment, autonomy, individuality, security, relationships and mood. This indicator reflects in part the relational or affective dimension of service provided in nursing homes, which is also subject to asymmetric information problem.¹⁴

¹⁴ We are poised to obtain the detailed measures that comprise the resident satisfaction variable, and will be able to use only those measures that fit our theoretical concept.

Organization type is captured by dummy variables reflecting for-profit homes (whether independent or belonging to a chain), nonprofit homes belonging to chains, independent nonprofit homes, and homes owned by local governments.

Control variables. We also control for firm size (number of residents), firm age, resident case-mix,¹⁵ market competition,¹⁶ and various demographic variables representing the home's area.¹⁷

b) An overview of sample differences among for-profit, nonprofit and government nursing homes

Table 1 presents a detailed comparative view of the 119 homes in our sample.¹⁸ The table includes also variables that are not examined in the estimations of structure and performance, but are discussed here in order to provide a more complete picture of the three types of organization.

We divide the sample into for-profit homes, nonprofit homes that are affiliated with a chain, independent nonprofit homes, and homes owned by a local government authority (mostly city, and some county). The small number of for-profit homes with data for all variables does not

¹⁵ The case mix index is calculated by the Minnesota State Department of Human Services on the basis of the intensity of care and services provided to residents in each nursing home.

¹⁶ The degree of market competition a nursing home faces is measured by the number of nursing homes within a 60-mile radius.

¹⁷ We assume that the demographics of the area represented by a nursing home's zip code are representative of the demographics of the home's residents.

¹⁸ Most of our analyses are conducted for fewer than 119 homes because of missing observations, and because the DEED database, collected in conjunction with the state and federal unemployment insurance programs, contains fewer nursing homes than the OSCAR database (because nursing homes operated by hospitals are combined with the rest of these hospitals' employment and wage data). In addition, DHS has a few missing observations. Hence when we use variables from all data sources the sample size may go down to 87 organizations. Our analyses suggest that the responding organizations do not differ significantly from the non-respondents, and the 87 respondents with data from all sources do not differ significantly from respondents with some data missing in one or more data bases.

allow us to investigate separately chain and independent homes as we do with nonprofit homes.¹⁹ The *population* of 409 nursing homes in Minnesota is composed of 111 for-profit facilities, 242 nonprofits and 56 government homes. Our *sample* includes a similar distribution of types of organization: 28 for-profit homes, 70 nonprofit homes (34 independent and 36 belonging to chains), and 21 local government homes.

Looking first at the general information, it appears that for-profit homes in our sample have been established much more recently than their nonprofit and government counterparts. For-profit homes were formed mostly in urban areas, whereas government homes mostly in rural areas, and nonprofit ones in both. The location of homes is associated with various geography-related demographic and economic factors: the higher density of nursing homes in more urban areas, the income per capita in the areas in which nursing homes operate, and more. Location differences notwithstanding, there is no significant difference associated with organization type in the proportion of residents who (home administrators claim) are visited weekly by their family members. Furthermore, the different types of homes have similar case mixes in terms of the residents' physical and mental conditions for which they are admitted into the homes. Nonprofit homes are larger than either for-profit and government homes. The information that we examined suggests therefore that for-profit nursing homes are relatively recent comers into a field that remains dominated by nonprofit and government organizations, and they concentrate in urban areas. But there does not seem to be a particular tendency on the part of any of the types of organization considered here to care for more or less difficult to treat residents.

¹⁹ We are still in the data collection stage of the project, and do not know at the moment the specific chain affiliation of all the nursing homes in our sample.

We turn now to a discussion of structure and behavior in nursing homes, focusing our attention on the core employees, nurses, who provide the main service in nursing homes and also represent a majority of their workforces. There are three different types of nurses: registered nurses (with most education and training, up to a M.A. degree), licensed practicing nurses and certified nursing assistants (with least training, which may include a few months-long courses but no college degree). Regarding different aspects of organization structure in Table 1, the overall impression is of substantial similarity, with a few notable differences. Starting with issues regarding decision-making we note that for-profit nurses have least influence on strategic decision-making, with government nurses having most influence. However, there is little difference in the degree of influence across different types of organization concerning nurses' influence on non-strategic decisions or in the degree of control nurses have over their own jobs.

In terms of compensation and benefits, there is substantial dispersion and difference in the degree of reliance on incentives and bonuses, but this measure does not quite capture the economist's idea of incentives. The incentives and bonuses that are common in our sample concern extra hourly pay (of a dollar or two) for taking on a night or weekend shift, but no nursing home has pay-for-performance schemes. This may be the result of the team nature of care, and the fact that care is spread over multiple shifts, so no individual nurse or even shift can be held accountable for results. Evaluation of nurses (which is practiced with regularity be essentially all homes) is the basis of pay raises in a minority of homes, with nearly a third of different types of homes practicing it, with the exception of nonprofit homes that belong to a chain, where only 18.78% of homes use merit as the primary basis for pay increases. Wage rates are essentially the same for nurses (see breakdown by type of nurse) across the different types of

organization. However, for-profit homes provide significantly fewer benefits than their nonprofit and government counterparts. Although we cannot assess the monetary value of the benefits, for-profit homes provide on average about one benefit plan less, out of the four listed. In sum, it appears that the main difference among types of homes is the greater prevalence of fringe benefits in nonprofit and government homes as compared to for-profit homes.

Regarding staffing of nurses, we observe that keeping teams of nurses together is the most important criterion and nearly equally so in all types of nursing homes. Most nursing homes have more full-time nurses than part-time ones; chain nonprofit homes have a much larger proportion of full-time nurses than other homes. The proportion of better trained registered and licensed nurses among all nurses, that is, including certified nursing assistants, is about half in nonprofit and government homes, but higher in for-profit ones. This difference is not statistically significant and it suggests, along with the previously discussed variables, that nursing homes with different types of ownership staff their core jobs in similar ways.

Turning to issues of monitoring, guidance and supervision, we find a somewhat contradictory picture. Nonprofit (especially chain-nonprofit) and government nurses are monitored most but guided and directed by supervisors least as compared to nurses in for-profit. Similar but weaker difference is found in the comparison between government and independent nonprofit nursing homes and for-profit counterparts.

Consider next the question of the nature of selection of new nurses, and their attitude to their jobs and organizations. We distinguish between recruiting of new nurses through referral by current

nurses from other conventional means, and observe that nonprofit homes rely more on employee referrals than either for-profit or government homes, but the differences are not statistically significant. Nurses are said by administrators to mostly regard their work not just as a job, and they believe in the mission of their organizations at a higher level. The differences among types of organization are small and statistically insignificant.

Although we do not investigate further the comparative behavior of nurses and their supervisors, we include a few items that help shed some light on the link between structure and performance. Workers in all types of nursing homes seem to work equally hard (by a slight and statistically insignificant margin the workload of for-profit nursing home employees is lighter than their nonprofit and government counterparts). The various aspects of behavior as reported by administrators in our sample differ little by type of organization. There is no difference in the reported extent to point out mistakes made by employees, either by their supervisors or by their coworkers. There is a hint of a stronger tendency on the part of employees in for-profit homes to report to management problems with service delivery and poor performance of their coworkers, but the differences are small and statistically insignificant (with the exception that for-profit nurses do report problems significantly more than nonprofit-chain nurses).

Finally, consider organizational outcomes and performance. For-profit and government homes show the largest number of residents per either licensed or certified nurse, and the nonprofit chain and independent homes show the lowest ratios. The differences are not very large, but they suggest a possibility of greater quantitative productivity in for-profit and government homes. The next performance measure, the number of regulatory deficiencies, indicates violations large and

small, of mostly quality indicators. The differences among different nursing types of nursing homes are small, with independent nonprofit and government homes showing the lowest numbers, hence highest quality. Pressure sores is the measure of the quality of care that is largely invisible to the eyes of the visiting family. The differences between for-profit and other types of nursing homes are large, with government homes having the fewest rates of pressure sores. Lastly, residents in nonprofit-independent homes enjoy significantly higher level of satisfaction than their counterparts residing in for-profit homes. But the difference between for-profit homes and other types of organization is small.

c) Estimation of the relationship between organization type and organization structure and performance

The examination of descriptive statistics uncovered many similarities and some differences among the three types of organization. In order to examine the linkages among organization type, structure and performance more carefully we turn next to multiple regression estimations. Organization type is represented by dummy variables, with the for-profit firm as the omitted variable. First, in order to identify differences in organization structure associated with organization type, we estimate a set of equations that relate the type of organization and various control variables to each of the components of organization structure. The structure elements include employee participation in strategic and non-strategic decision, the reliance on merit for pay raises, the number of fringe benefits, monitoring on employees, reliance on social networks to select new employees, and staffing level as measured by number of full-time equivalent nurses

per resident. We account for the simultaneous determination of the various elements of structure by using three-stage least squares regression.²⁰

Next we examine performance relative to the three types of organization, using the measures described earlier. We adopt a Cobb-Douglass production function framework for all the estimations to account for the input of nursing staff in producing home outcomes, with augmentation by organization type and controls for various factors.²¹ The nursing staff input includes numbers of licensed nurses (RNs and LPNs) and certified nursing assistants (CNAs). To account for the simultaneity of choice of the four performance measures (or the decision underlying them) we use two-stage least squares (seemingly unrelated) regressions. Finally, we examine the association between organization type and the four dimensions of performance while controlling for organization structure. At this stage of estimation we include the same set of control variables as previously discussed, plus the full set of organization structure elements, and ignore the endogeneity of organization structure.

Tables 2-4 summarize results regarding the relationship among organization type, structure and performance: Table 2 shows the association between organization type and organizational structure, Table 3 presents the relationship between organization type and organization performance, and Table 4 examines the relationship between organization type and organization performance, controlling for organization structure.²²

²⁰ As noted earlier, in this draft we do not examine in detail the various factors associated with organization structure and the relationships among its elements.

²¹ The production function is partial since we do not include the input of non-nursing labor and capital and other inputs.

²² Estimations using independent equations (instead of 3SLS and 2SLS) yield similar results to those reported in Tables 2 and 3, and are shown in Tables 1A and 2A of the Appendix.

Table 2 shows significant differences in organization structure across organization types. Both types of nonprofit organizations, chain or autonomous, adopt significantly higher level of strategic and non-strategic decision-making, non-pecuniary benefits, and social network selection of employees than for-profit homes. A similar pattern is found in the government-for-profit comparison, except for the implementation of network selection method. The finding largely verifies our theoretical predictions.

Table 3 provides weak evidence that outcomes and performance vary across the three types of organization in accordance with our theoretical predictions. First, in terms of efficiency, the quasi-production function in the first column shows no difference across organization types. Thus we reject the hypothesis of inefficient production in nonprofit and government homes relative to for-profit homes. Second, there is no difference in the measure of observable quality (deficiency citations) across organization types. Third, regarding the element of asymmetric information or unobservable quality, back pressure sores, nonprofit and government homes perform significantly better than for-profit homes, as predicted. Fourth, concerning the relational element represented by resident satisfaction, independent nonprofit homes perform significantly better than for-profit counterparts, but the performance of chain nonprofit and government homes is indistinguishable from that of for-profit homes.

In Table 4 we estimate performance controlling for organization structure elements. The results are very similar to those presented in Table 3, except that a tendency for lower efficiency (in the first column) in chain-nonprofit homes, and very weakly in independent nonprofit and

government homes, is now detected. The comparison between Tables 3 and 4 suggests that organization structure generally does not affect organization performance independent of organization type.

IV. Discussion and Conclusions

This paper examined differences in organization structure and performance associated with organizational type - for-profit, nonprofit and government – using a unique dataset consisting of 119 nursing homes. Regarding structure, we hypothesize that since different types of organization have different objectives that must be pursued in part by different means, there will be also differences in the design of organization structure. Second, organizations with different ownership status have different principal-agent problems, which require different solutions, that is, different degrees and combinations of components of organization structure. Third, some employees may care about the mission of the organization for which they work, and such workers are recruited differently and treated differently by employers, resulting in different organization structure. At the same time, economic and social pressures militate in favor of common structures and similar behaviors.

Expounding on these three considerations we hypothesized that for-profit firms will delegate less decision-making power to their employees, will provide more incentives and fewer fringe benefits, will monitor less, and will rely less on social networks to recruit new employees than nonprofit and government organizations. Our empirical findings support generally these hypotheses.

For-profit firms, nonprofit organizations and government-owned organizations have putatively different objectives and different types and degrees of agency problems. These differences should generate also generate different behaviors and different outcomes. We differentiated outcomes by four key dimensions: quantity, certain aspects of quality that are affected by asymmetric information, certain elements of the service that are affected by asymmetric information, and the relational or affective element of a service, which is also affected by asymmetric information. In terms of the first two dimensions, unless the different types of organization operate in specialized niches, outcomes will tend to converge through the mechanism of input and output market competition and through pressures of institutional isomorphism.²³ An additional difference may be associated with more severe agency problems experienced by nonprofit and government homes that are not remedied by organization structure. Our empirical investigation of nursing homes suggests that differences in these two dimensions of performance (measured by production function and deficiency citations) are small and there is no strong differentiation among for-profit, nonprofit and government homes. However, we also hypothesized that for-profit firms will provide lower quality care under the cover of asymmetric information between them and their customers; nonprofit and government homes, presumably constituted to provide trustworthy care, will outperform for-profits on this dimension. Consistent with previous empirical studies that found for-profit nursing homes compromise service quality when asymmetric information exists (e.g., Weisbrod & Schlesinger, 1986; Chou, 2002), our empirical investigation of the other two dimensions of performance (measured by back pressure

²³ This is so unless the demand for organization type is correlated with demand for quality, for example if higher income individuals demand higher quality and are also more aware of asymmetric information and relational problems and therefore opt more frequently for nonprofit homes, in which case nonprofit homes will be associated with higher quality.

sores and resident satisfaction) does demonstrate difference among organization types: the results are consistent with the conjecture that for-profit homes are more likely to exploit the advantage of asymmetric information than their nonprofit and government counterparts.

The issue of comparative organizational efficiency and particularly productivity has not been settled in the literature on the three sectors. Our findings indicate the possibility that there is little difference among different types of organization in terms of structure, behavior and performance; in particular, we find practically no evidence that for-profit firms in the nursing home industry are more productive in the simple sense of serving more residents with a given size and mix of nursing staff. And there is no evidence that nonprofit and government nursing homes provide better quality of service than for-profit homes, when asymmetric information is not a severe problem. At the same time there is evidence consistent with the conjecture of superior performance by nonprofit and government nursing homes when asymmetric information is salient.

Further investigation of factors associated with different types of organization is required in order to make a stronger determination of what differences might there exist among the three sectors when they coexist in the same industry. For example, one important question is whether there is substantial self-selection by customers into different types of organization. Self selection may be based on recognition by customers (residents or their families who place them in nursing homes) that asymmetric information between providers of care and recipients of care cannot be eliminated, leading some customers to make the selection of a nursing home on the basis of organizational type, with those fearing the consequences of asymmetric information opting for

nonprofit and government homes over for-profit ones.²⁴ On the long run, with information about nursing already available and more to become available in the future, asymmetric information will be temporary and isolated, hence the advantages of nonprofit and government organizations will dissipate, and to the extent that their principals choose to keep them in business, there will be increasingly fewer differences between them and for-profit homes (Ben-Ner, 2002).²⁵

Our results are rather tentative, both in terms of analysis and the small size of the sample. More data collection and analysis are required in order to establish what differences there exist in the performance and outcomes of organizations that belong to different sectors but operate in the same narrowly-defined productive activity.

²⁴ We are undertaking such an investigation.

²⁵ For example, Nursing Home Compare, a website provided by the federal government, contains easily accessible information about individual nursing homes similar to the information provided in OSCAR. Many private firms now provide this information in various formats. The State of Minnesota (and presumably other states) provides additional detailed information on nursing homes.

References

- Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics*, 84: 488-500.
- Ben-Ner, Avner. 1988. "The Life Cycle of Worker-Owned Firms in Market Economies: A Theoretical Analysis," *Journal of Economic Behavior and Organization*, 10:287-313. Reprinted in *Producer Cooperatives and Labor-Managed Systems* (David Prychitko and Jaroslav Vanek, eds.), The International Library of Critical Writings in Economics series, Edward Elgar Publishing Ltd., 1996.
- Ben-Ner, Avner. 2002. "The Shifting Boundaries of the Mixed Economy and the Future of the Nonprofit Sector," *Annals of Public and Cooperative Economics*, 73: 5-40.
- Ben-Ner, Avner. 2006. "For-Profit, State And Non-Profit: How To Cut The Pie Among The Three Sectors," in Jean-Philippe Touffut (Ed.), *Advancing Public Goods*, Cheltenham, UK, and Northampton, MA: Edward Elgar, pp. 40-67. French edition published by Albin Michel.
- Ben-Ner, Avner and Theresa Van Hoomissen. 1991. "Nonprofit Organizations in the Mixed Economy: A Demand and Supply Analysis," *Annals of Public and Cooperative Economics*, 62: 519-550. Reprinted in *The Nonprofit Sector in the Mixed Economy* (Avner Ben-Ner and Benedetto Gui, eds.), University of Michigan Press, 1993, pp. 27-58; reprinted in *The Economics of Nonprofit Enterprise* (Richard Steinberg, editor), The International Library of Critical Writings in Economics series, Edward Elgar Publishing, 2004.
- Ben-Ner, Avner, J. Michael Montias and Egon Neuberger. 1993. "Basic Issues in Organizations: A Comparative Perspective," *Journal of Comparative Economics*, 17: 207-242.
- Ben-Ner, Avner, Fanmin Kong and Stephanie Luis. 2006. "Uncertainty and Organization Design," Draft, Industrial Relations Center, University of Minnesota.
- Bloom, Nicholas and John Van Reenen. 2006. "Measuring and Explaining Management Practices across Firms and Countries," CEPR Discussion Papers 5581.
- Cawley, John, David C. Grabowski, and Richard A. Hirth. 2004. "Factor Substitution and Unobserved Factor Quality in Nursing Homes," NBER Working Paper No. W10465.
- Chou, Shin-Yi. 2002. "Asymmetric Information, Ownership and Quality of Care: A Empirical Analysis of Nursing Homes," *Journal of Health Economics*, 21: 293-311.
- DiMaggio, Paul J. and Walter W. Powell. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review*, 48: 47-160.

- Dreze, Jacques H. and Kare P. Hagen. 1978. "Choice of Product Quality: Equilibrium and Efficiency," *Econometrica*, 46: 493-513.
- Glaeser, Edward L. 2003. "Introduction," In Edward L. Glaeser (Ed.), *The Governance of Not-for-Profit Organizations*: 1-44. Chicago and London: The University of Chicago Press.
- Grabowski, David C. and Richard A. Hirth. 2002. "Competitive Spillovers across Non-Profit and For-Profit Nursing Homes," *Journal of Health Economics*, 21: 1-22.
- Hansmann, Henry B. 1996. *The Ownership of Enterprise*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Horowitz, Jill R. 2005. "Does Corporate Ownership Matter? Service Provision in the Hospital Industry," NBER Working Paper No. W11376.
- Jensen, Michael C. and William H. Meckling. 1976. "Theory of the Firm: Managerial Behavior, Agency Costs, and Capital Structure," *Journal of Financial Economics*, 3: 305-360.
- Koopmans, Tjalling C. 1957. *Three Essays on the State of Economic Science*. New York: McGraw-Hill Book Co.
- Meggison, William L., and Jeffrey M. Netter. 2001. "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature*, 39: 321-389.
- Minnesota Department of Health and Human Services. 2006. *Technical User Guide: Minnesota Nursing Facility Report Card*.
- Pauly, Mark V. and Michael Redisch. 1973. "The Not-For-Profit Hospital as a Physicians' Cooperative," *American Economic Review*, 63: 87-99.
- Santerre, Rexford E. and John A. Vernon. 2005. "Testing for Ownership Mix Efficiency: The Case of the Nursing Home Industry," NBER Working Paper No. W11115.
- Steinberg, R. 1987. "Nonprofit Organizations and the Market," In W. W. Powell (Ed.), *The Nonprofit Sector: A Research Handbook*: 118-38. New Haven, CT and London: Yale University Press. Reprinted in R. Steinberg (Ed.), *The Economics of Nonprofit Enterprises: 19-39*. Cheltenham, UK and Northampton, MA: Edward Elgar. 2004.
- Weisbrod, Burton A. 1988. *The Nonprofit Economy*. Cambridge, MA: Harvard University Press.
- Weisbrod, Burton A. and Mark Schlesinger. 1986. "Public, Private, Nonprofit Ownership and the Response to Asymmetric Information: The Case of Nursing Homes," In S. Rose-Ackerman (Ed.), *The Economics of Nonprofit Institutions*: 133-151. New York and Oxford, UK: Oxford University Press.

Table 1. Descriptive Statistics of Variables by Nursing Homes' Organization Type: Means (Standard Deviations) ¹

	<i>For-profit</i>	<i>Nonprofit – chain</i>	<i>Nonprofit – independent</i>	<i>Local government</i>	<i>Data source²</i>
	(1)	(2)	(3)	(4)	
General information					
Number of homes in sample	28	36	34	21	
Home age	24.56 (14.15)	64.79*** (36.72)	60.32*** (37.82)	57.10*** (35.91)	MNHES
Number of residents	69.85 (47.24)	84.47* (37.52)	87.97* (44.19)	68.95 (33.04)	MNHES & OSCAR
Urban location of a home (%)	63.16 (40.51)	55.47 (40.48)	43.55** (39.68)	38.91** (40.40)	CENSUS
Number of nursing homes within 60 mile radius of a home	25.50 (15.05)	21.06 (14.47)	22.06 (14.62)	17.76** (15.21)	MNHES & Zipcode
Population over 65 in home's zip code area (%)	14.56 (5.22)	18.14** (6.60)	16.11 (5.24)	17.46** (5.45)	CENSUS
Income per capita in home's zip code area (1999, \$10k)	21.67 (9.66)	20.66 (4.90)	19.69 (5.13)	18.76* (1.79)	CENSUS
Proportion of residents visited by family every weekend (%)	41.68 (25.49)	38.62 (22.10)	46.13 (25.92)	41.10 (25.09)	MNHES
Case mix index (higher score means higher resident acuity; state average 1.01, sample range 0.65-1.26)	0.98 (0.14)	1.02 (0.07)	1.00 (0.09)	1.00 (0.05)	DHS
Nurses' task complexity	2.54 (0.54)	2.65 (0.41)	2.66 (0.59)	2.62 (0.55)	MNHES
Organization structure					
Nursing staff's ³ influence on strategic decision-making (scale 1-5)	1.92 (0.53)	2.01 (0.65)	2.14* (0.59)	2.35*** (0.53)	MNHES
Nursing staff's influence on non-strategic decision-making (scale 1-5)	1.83 (0.90)	1.85 (0.55)	1.88 (0.67)	1.94 (0.61)	MNHES
Control over nurses' own jobs (1-5)	3.29 (0.93)	3.38 (0.89)	3.23 (0.65)	3.08 (0.66)	MNHES
Incentives/bonuses (% homes having them)	17.86 (39.00)	19.44 (40.14)	32.35 (47.49)	9.52 (30.08)	MNHES
Merit as basis for pay raise (% of homes)	29.78 (45.44)	18.78 (37.32)	31.31 (46.33)	31.58 (44.34)	MNHES
Number of fringe benefits (pension plan, health insurance, paid vacation leave, paid sick leave, 1-4)	2.67 (1.17)	3.60*** (0.78)	3.83*** (0.38)	3.90*** (0.31)	MNHES
Registered nurses wage	22.88 (6.35)	22.13 (3.60)	22.19 (3.10)	23.91 (4.27)	MNHES
Licensed nurses wage	16.44 (2.31)	16.11 (2.23)	16.01 (1.90)	16.27 (1.90)	MNHES
Certified nurses wage	10.94 (1.68)	11.15 (1.44)	11.03 (1.34)	11.56 (1.45)	MNHES
Importance of <i>availability</i> for assigning nursing staff to a unit (1- most important, 3 – least important)	1.66 (0.57)	1.85 (0.58)	1.81 (0.70)	1.86 (0.75)	MNHES
Importance of being with <i>same patients</i> for assigning nursing staff to a unit (1-3)	1.37 (0.43)	1.31 (0.48)	1.38 (0.53)	1.49 (0.66)	MNHES
Importance of being with <i>same coworkers</i> for assigning nursing staff to a unit (1-3)	2.69 (0.67)	2.71 (0.52)	2.64 (0.62)	2.51 (0.58)	MNHES
Full time/Part time nursing staff	1.24 (0.96)	2.22** (2.48)	1.11 (1.07)	1.36 (2.88)	MNHES
(Registered + Licensed nurses)/All nurses (FTEs)	0.63 (0.48)	0.53 (0.16)	0.52 (0.21)	0.50 (0.16)	MNHES
Monitoring of nursing staff (1- not at all, 5 – extreme)	3.54 (0.80)	3.94** (0.85)	3.78 (0.69)	3.86* (0.75)	MNHES
Guiding and direction of nursing staff (1- not at all, 5 – extreme, reversed scoring)	2.45 (0.77)	2.05** (0.79)	2.20* (0.63)	2.20* (0.45)	MNHES
Selection of new workers through referral by current employees (%)	29.07 (45.46)	34.34 (45.81)	39.61 (48.07)	23.88 (41.54)	MNHES
“Working here is just a job” (1- strongly disagree, 5 – strongly agree; reverse scoring)	3.76 (0.70)	3.76 (0.82)	3.79 (0.59)	4.01 (0.91)	MNHES
“Believe in the mission of the organization” (1- strongly disagree, 5 – strongly agree)	3.95 (0.86)	4.12 (0.55)	4.06 (0.70)	4.14 (0.54)	MNHES

	<i>For-profit</i>	<i>Nonprofit – chain</i>	<i>Nonprofit – independent</i>	<i>Local government</i>	<i>Data source²</i>
	(1)	(2)	(3)	(4)	
Organizational behavior					
How demanding the workload (1 – very low, 5 – very high)	3.94 (0.77)	4.07 (0.62)	4.13 (0.68)	4.15 (0.59)	MNHES
Supervisors point out mistakes to employees (1 – not at all, 5 - extreme)	3.80 (0.87)	3.72 (0.77)	3.71 (0.65)	4.03 (0.56)	MNHES
Employees point out mistakes to coworkers (1 – not at all, 5 - extreme)	3.10 (1.08)	3.19 (0.97)	3.02 (0.76)	3.36 (0.61)	MNHES
Employees report to management problems with service delivery (1 – not at all, 5 - extreme)	3.77 (0.95)	3.39** (0.66)	3.58 (0.83)	3.71 (0.56)	MNHES
Employees report to management poor performance by coworkers (1 – not at all, 5 - extreme)	3.46 (1.03)	3.18 (0.80)	3.70 (0.85)	3.38 (0.67)	MNHES
Organizational performance					
Residents/licensed nurse	4.47 (2.00)	3.98 (0.97)	4.21 (1.19)	4.55 (1.20)	MNHES & OSCAR
Residents/certified nurse	2.41 (1.43)	2.02* (0.47)	2.02* (0.53)	2.21 (0.70)	MNHES & OSCAR
Number of regulatory deficiencies	1 (2.74)	1.03 (2.27)	0.44 (1.26)	0.19* (0.68)	OSCAR
Pressure sores	3.48 (6.18)	1.44* (4.15)	1.56* (4.14)	0.71** (2.26)	OSCAR
Resident satisfaction/quality of life (0-13)	10.72 (0.23)	10.72 (0.25)	10.88*** (0.19)	10.67 (0.25)	DHS

Notes:

- The variables representing nonprofit-chain, nonprofit-independent, and local government homes are compared pairwise with variables representing for-profit homes. The results of *t*-tests are indicated with *, **, and *** for the 10, 5, and 1% levels. The *t*-test is not always indicated, given the distribution of the observations, hence we carried out also Mann-Whitney tests. With the exception of the “pressure sores” variable, both *t* and Mann-Whitney tests yield similar results; in the case of sores, the government-for-profit difference is significant by both tests, but only by M-W for the two nonprofit types.
- MNHES - Minnesota Nursing Home Survey
DEED - Minnesota State Department of Employment and Economic Development
OSCAR - Online Survey, Certification and Reporting data of nursing facilities, maintained by the Centers for Medicare and Medicaid Services (CMS)
DHS - Minnesota State Department of Human Services
Census –US Census Data 2000
Zipcode – Zipcode data
- “Nursing staff” refers to registered, licensed and certified nurses together. Registered nurses are RNs, licensed nurses are LPNs (licensed practicing nurses), and certified nurses are CNAs (certified nursing assistants), with RNs being most educated and CNAs least.

Table 2. Organization Type and Structure ^{1 2}

Independent variables	Strategic decision making	Non-strategic decision making	Merit based pay	Fringe benefits	Monitoring	Selection	Nursing staff per resident
	3SLS						
Nonprofit chain	0.141* (0.082)	0.178* (0.101)		0.097* (0.057)		1.209* (0.658)	0.059 (0.218)
Nonprofit independent	0.227*** (0.083)	0.184* (0.095)		0.170*** (0.059)		1.621** (0.670)	0.041 (0.220)
Government	0.300*** (0.092)	0.221** (0.112)		0.223*** (0.065)		0.949 (0.740)	-0.285 (0.245)
Strategic decision making			10.751 (11.932)		-0.647 (1.118)		
Non-strategic decision making			-14.629 (15.717)		1.275 (1.474)		
Control variables ³	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	87	87	87	87	87	87	87
Chi2	21.13	6.25	1.68	29.88	1.54	9.56	6.33
Prob>F	0.00	0.51	0.95	0.00	0.96	0.21	0.61
R-squared	0.19	0.07	-4.06	0.26	-2.33	0.10	0.07

¹ All variables except for organization type dummies are in natural logarithm form. Estimations based on levels yield similar results.

² *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

³ We control for firm size (total number of residents), market competition, case mix, firm age for all the estimations, and additional control of job complexity for the estimation of nursing staff per resident.

Table 3. Organization Type and Performance ^{1 2}

Independent variables	Total number of residents (Quantitative dimension)	Deficiency citation (Quality of service dimension)	Back pressure sores (Asymmetric information dimension)	Resident satisfaction (Relational dimension)
	2SLS			
Nonprofit chain	-0.059 (0.066)	0.078 (0.182)	-0.598** (0.262)	0.003 (0.007)
Nonprofit independent	-0.015 (0.067)	-0.132 (0.184)	-0.666** (0.266)	0.017** (0.007)
Government	0.024 (0.073)	-0.220 (0.200)	-0.571* (0.289)	-0.002 (0.007)
Full-time equivalent registered and licensed nurses	0.551*** (0.072)	0.124 (0.213)	0.216 (0.307)	-0.001 (0.008)
Full-time equivalent certified nursing assistants	0.380*** (0.066)	-0.078 (0.185)	0.274 (0.267)	-0.000 (0.007)
Control variables ³	Yes	Yes	Yes	Yes
N	93	93	93	93
Chi2	429.03	13.76	19.07	18.86
Prob>F	0.00	0.13	0.02	0.02
R-squared	0.82	0.13	0.17	0.17

¹ All variables except for organization type dummies are in natural logarithm form. Estimations based on levels yield similar results.

² *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

³ We control for market competition and firm age for all the estimations, case mix for the estimations of deficiency citation, back pressure sores and total number of residents, and per capita income in the zip code area for the estimations of deficiency citation, back pressure sores and resident satisfaction.

Table 4. Organization Type, Structure and Performance ^{1 2}

Independent variables	Total number of residents (Quantitative dimension)	Deficiency citation (Quality of service dimension)	Back pressure sores (Asymmetric information dimension)	Resident satisfaction (Relational dimension)
2SLS				
Nonprofit chain	-0.127* (0.076)	0.143 (0.207)	-0.668** (0.288)	0.002 (0.007)
Nonprofit independent	-0.057 (0.080)	-0.114 (0.220)	-0.534* (0.306)	0.016** (0.008)
Government	-0.024 (0.087)	-0.183 (0.238)	-0.470 (0.332)	-0.007 (0.009)
Full-time equivalent registered and licensed nurses	0.568*** (0.077)	0.008 (0.231)	0.202 (0.322)	0.010 (0.008)
Full-time equivalent certified nursing assistants	0.364*** (0.067)	-0.053 (0.194)	0.178 (0.270)	-0.005 (0.007)
Strategic decision making	-0.009 (0.100)	0.056 (0.282)	-0.111 (0.393)	0.008 (0.010)
Non-strategic decision making	0.046 (0.082)	-0.392* (0.232)	-0.155 (0.323)	0.006 (0.008)
Merit based pay	-0.018 (0.012)	-0.028 (0.033)	-0.057 (0.046)	0.001 (0.001)
Non-pecuniary benefits	0.179 (0.126)	0.016 (0.356)	0.017 (0.497)	-0.009 (0.013)
Monitoring	0.006 (0.100)	-0.075 (0.281)	0.817** (0.391)	0.002 (0.010)
Selection	0.003 (0.011)	-0.007 (0.030)	-0.044 (0.042)	-0.000 (0.001)
Nursing staff per resident		0.062 (0.099)	-0.140 (0.138)	-0.004 (0.003)
Control variables ³	Yes	Yes	Yes	Yes
N	85	85	85	85
Chi2	413.79	19.15	27.34	25.97
Prob>F	0.00	0.26	0.04	0.04
R-squared	0.83	0.19	0.24	0.23

¹ All variables except for organization type dummies are in natural logarithm form. Estimations based on levels yield similar results.

² *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

³ We control for market competition and firm age for all the estimations, case mix for the estimations of deficiency citation, back pressure sores and total number of residents, and per capita income in the zip code area for the estimations of deficiency citation, back pressure sores and resident satisfaction.

APPENDIX

Table 1A. Organization Type and Structure ^{1 2}

Independent variables	Strategic decision making	Non-strategic decision making	Merit based pay	Non-pecuniary benefits	Monitoring	Selection	nursing staff per resident
	Independent Equations (OLS)						
Nonprofit chain	0.162* (0.086)	0.196* (0.106)		0.080 (0.071)		1.220* (0.669)	-0.012 (0.235)
Nonprofit independent	0.214** (0.087)	0.186* (0.107)		0.201*** (0.071)		1.602** (0.682)	0.091 (0.239)
Government	0.313*** (0.094)	0.192 (0.116)		0.239*** (0.079)		0.944 (0.762)	-0.349 (0.260)
Strategic decision making			-0.299 (0.915)		0.114 (0.106)		
Non-strategic decision making			0.071 (0.773)		-0.025 (0.087)		
Control variables ²	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	92	92	92	92	91	91	93
F	2.73	0.85	0.63	2.99	0.50	1.26	0.83
Prob>F	0.01	0.55	0.71	0.01	0.80	0.28	0.57
R-squared	0.19	0.07	0.04	0.20	0.03	0.10	0.07

¹ All variables except for organization type dummies are in natural logarithm form. Estimations based on levels yield similar results.

² *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

³ We control for firm size (total number of residents), market competition, case mix, firm age for all the estimations, and additional control of job complexity for the estimation of nursing staff per resident.

Table 2A. Organization Type and Performance ^{1 2}

Independent variables	Total number of residents (Quantitative dimension)	Deficiency citation (Quality of service dimension)	Back pressure sores (Asymmetric information dimension)	Resident satisfaction (Relational dimension)
Independent Equations (OLS)				
Nonprofit chain	-0.067 (0.069)	0.096 (0.187)	-0.598** (0.276)	0.001 (0.007)
Nonprofit independent	-0.036 (0.069)	-0.112 (0.188)	-0.665** (0.278)	0.016** (0.007)
Government	0.017 (0.076)	-0.201 (0.206)	-0.572* (0.304)	-0.003 (0.008)
Full-time equivalent registered and licensed nurses	0.564*** (0.076)	0.122 (0.222)	0.210 (0.322)	-0.002 (0.008)
Full-time equivalent certified nursing assistants	0.368*** (0.069)	-0.072 (0.194)	0.277 (0.281)	-0.000 (0.007)
Control variables ³	Yes	Yes	Yes	Yes
N	95	95	94	94
F	48.86	1.44	1.94	2.01
Prob>F	0.00	0.18	0.06	0.06
R-squared	0.82	0.13	0.17	0.16

¹ All variables except for organization type dummies are in natural logarithm form. Estimations based on levels yield similar results.

² *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

³ We control for market competition and firm age for all the estimations, case mix for the estimations of deficiency citation, back pressure sores and total number of residents, and per capita income in the zip code area for the estimations of deficiency citation, back pressure sores and resident satisfaction.