

A Comparative Study of Structure and Performance in For-Profit, Nonprofit and Government Organizations*

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Abstract

We study differences in structure and performance among for-profit (FP), nonprofit (NP) and government (GOV) organizations. These organizations differ in their ownership structure, objectives and agency relations. We conjecture that, compared to NP and GOV, FP (a) delegate less decision-making power to employees, (b) provide more incentives and fewer fringe benefits, (c) monitor less, and (d) rely less on social networks to recruit employees. We also hypothesize that compared to NP and GOV, FP (i) are more productively efficient, (ii) provide similar levels of elements of their service that are observable by their customers, (iii) provide lower levels of elements that are less-well observed by customers, and (iv) provide less of the relational or affective elements. Differences in structure and performance are tempered by market competition and institutional pressures for similarity. Our empirical investigation of Minnesota nursing homes (utilizing state, federal and survey data) supports these hypotheses.

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I. Introduction

Does organization type matter? Do nonprofit and government employees work less hard, less well or with less concern for their duties than their for-profit counterparts? Does it matter whether children – your children – go to a for-profit, nonprofit or government child care center, elementary school or college? Would you prefer to place an elderly relative in a for-profit, nonprofit or government nursing home? Does organization ownership make a difference?

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 for-profit firms generally outperform government-owned firms (e.g., Megginson and Netter, 2001), but comparisons between for-profit and nonprofit organizations, although both privately-owned, are more complicated. Some studies show greater efficiency in for-profit organizations (e.g., Nyman and Bricker, 1989, in nursing homes). Others argue that the comparisons must 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., Horwitz, 2005).

In this paper we examine three types of organization: *for-profit firms*, *nonprofit organizations*, and *government organizations*. Differences in performance among organizations arise from differences in their objectives, in strategies employed to pursue them, and in effectiveness of how these strategies are pursued. Formal control is vested in owners of for-profit firms, boards of directors of nonprofit organizations, and politicians in charge of government agencies in the case of government-owned organizations. As a consequence of the locus of control, for-profit firms are likely to emphasize profits above and at the expense of other objectives. Nonprofit and government organizations are likely to focus on objectives that reflect the views and interests of the groups that sponsor them.

Unlike in for-profit firms, in nonprofit and government organizations there are no individuals whose wealth is tied to the organization. Agency considerations suggest therefore that principals of for-profit firms will be more effective in driving efficiency than their

counterparts in nonprofit and government organizations. But nonprofit and government organizations may draw workers and managers who believe in providing products that reflect public needs rather than the needs reflected in for-profit provision. Such motivation may help compensate for at least some of the greater agency problems that nonprofit and government organizations encounter relative to for-profit firms. Organization structure may also reduce the difference in the severity of agency problems. Those who control an organization will design an organization structure – 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 pursue the organization’s objectives rather than their own personal goals.

An organization may sometimes be able to advance its objectives by taking advantage of special circumstances available to it. For example, customers in nursing homes are in an informationally weak position relative to providers. Given different organizational objectives, the three types of organization may respond differently to this informational asymmetry, leading to greater differentiation in provision of those aspects of the service that are not observable to residents’ families and which residents cannot communicate well.

In this paper we examine empirically the association between organization type, organization structure and organizational performance. We focus on for-profit, nonprofit and government organizations that coexist in the same industry, nursing homes. We concentrate on a single state, Minnesota, to exclude influences associated with geographic heterogeneity detected in many studies (e.g., Bloom and van Reenen, forthcoming), to control for the legal, regulatory, and enforcement environments, which vary considerably across states, and to take advantage of the availability of detailed datasets in Minnesota. We investigate performance of all nursing homes in Minnesota that appear in relevant state and federal datasets (313 homes), and organization structure among homes that responded to our survey (82 homes with usable detailed data out of 121 respondents).

Nursing homes are small and relatively simple organizations that provide a service that shares much in common with many other personal and health services. Care is provided to residents day and night by various health professionals, from nurse aides to medical specialists. Residents in nursing homes are typically frail elder individuals suffering from various physical and mental limitations; they often arrive at a nursing home on the heels of a critical event such as a fall or a stroke and spend only a few months to be discharged to home, to assisted living

arrangement or another nursing home, a to hospital. Family members typically make most care decisions on behalf of the residents although they may not have access to important information about the nursing home that provides care to their loved ones; in our sample, for example, only 42% of residents have visitors on an average weekend.¹

An empirical analysis of nursing homes provides therefore an exceptional opportunity to examine the interplay among organization type, organizational structure and outcomes in the shadow of asymmetric information. An empirical investigation of nursing homes is possible thanks to the unique availability of detailed data generated in conjunction with the regulatory process; this sort of information is not available for other products with similar attributes. There have been several comparative studies of structure and performance across types of organization, although none has been as comprehensive in its scope and as detailed in its data as our study.² Our empirical findings suggest that there are significant differences among the three types of organization in ways predicted by theory, but the magnitude of these differences is limited, presumably constrained by market competition, regulation, and the practices of workers who are dedicated to their professions.

The paper is organized as follows. In Section II of the paper we develop a conceptual framework for the analysis of the relationship between organization type, organization structure and organizational performance. In Section III we introduce the nursing home industry, the datasets, and variables used in the empirical estimations. In Section IV we describe our empirical investigation. Section V concludes the paper.

¹ The nature of nursing home care and the fact that the great majority of people ends up at some point in a nursing home, have generated substantial scholarly and journalistic interest in the industry as well as regulatory oversight. In 1980, the book *Unloving Care: The Nursing Home Tragedy* by Bruce Vladeck uncovered a range of troublesome abuses. The regulatory framework was strengthened in response to the book's revelations, but later research and personal witnesses revealed that despite of the changes, much is still happening in nursing homes that contradicts expectations for humane and decent care for residents. See, for example, the recent book by a nursing home aide (Gass, 2004) relating his own experience, and a book by renowned expert on long-term care and his sister recounting the nursing home experience of their mother (Kane and West, 2005). A recent report by the Government Accountability Office (2007) argues that federal regulation and enforcement are not nearly as effective as one would expect given the information and power at the disposal of regulators.

² Past research on comparative organization structure includes Roomkin and Weisbrod (1999), who study structure affecting the work of executives in hospitals and DeVaro and Brookshire (2007), who investigate structure affecting the work of employees in multiple occupations and industries. Comparative studies of performance are many, including Weisbrod and Schlesinger (1986), Nyman and Bricker (1989) and Santerre and Vernon (2005) in nursing homes, and Horowitz (2005) in hospitals. We compare our findings to these authors' and those of others in the concluding section of the paper.

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

We set the stage for our investigation with a very brief exposition of reasons for the coexistence of for-profit, nonprofit and government organizations in the same market. Next we analyze the ways in which differences in organizational objectives, agency problems, and worker self selection drive differences in performance with the goal of informing our comparative empirical investigation of for-profit, nonprofit and government nursing homes.

(a) Why are there multiple types of organization?

In a perfectly competitive market there are no reasons for substituting or complementing for-profit firms with other types of organization. As Tjalling Koopmans had shown half a century ago (1957), no Pareto-optimal gains can be made by consumers, workers or owners through rearrangement of their respective roles or through reallocation of decision-making power from one group to another. He illustrated this result (the theorem of separating hyperplanes) by suggesting that Robinson Crusoe, shipwrecked on an island, should make production, work and consumption decisions in isolation of each other domain as if he were three separate individuals. The separation among the decisions of the profit-maximizing firm (“resource-holder”), the utility-maximizing worker and the utility-maximizing consumer is optimal when the standard assumptions of perfect competition hold: no market power, symmetric information, rivalry, excludability, anonymity, and no externalities.³

However, when one or more of these assumptions are violated (that is, there is some ‘market failure’) firm owners, workers or consumers incur some losses. There are two alternative classes of actions that may improve the well-being of the affected parties. First, government action through regulation, legal requirements, taxation, subsidies and related measures can be addressed at specific problematic situations in order to ameliorate their consequences. Second, internalization of the gains associated with actions that reduce the well-being of one or both parties to a transaction may be accomplished by establishing organizations that combine the two parties into one: worker cooperatives or employee-owned firms that combine resource-holders and workers, consumer cooperatives that combine resource-holders and consumers, and

³ These are familiar concepts that do not require elaboration for present purposes. Koopmans does not use these terms, but his assumptions regarding the production and consumption functions translate into the conditions stated in the text.

nonprofit organizations that combine resource-holders and consumers or their benefactors. Internalization eliminates incentives to take advantage of or create market failures by integrating the parties and their interests. Those government organizations that are operated with the goal of social welfare maximization may be thought of as representing integration of the parties' goals under the control of a benefactor (the government) rather than integration of the parties themselves.

The emergence of alternatives to for-profit firms is not an automatic consequence of market failures, even if government regulation and other interventions fail to materialize. Alternative types of organization may arise if their relative net benefit is positive, that is, their added benefits exceed their added costs. Several costs vary with organization type: the cost of entrepreneurship, the cost of raising capital and other resources, 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 and may exceed the added benefits, so 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.⁴

The foregoing discussion suggested reasons why different products may be provided by different types of organization. But why do different types of organization coexist within the same industry and market? Focusing on the firm-consumer interface, the subject matter of this paper, one factor that can generate multitude of organizational types is diversity among consumers in terms of the costs and benefits they expect to incur from dealing with different organizations.⁵ For example, some consumers may be better able than others to evaluate the services of for-profit firms and do not need to rely on protection against the consequences of asymmetric information through nonprofit provision; or some consumers may have better access to resources needed to form nonprofit organizations more readily than other consumers. As a result, different types of organization may produce different variants of the same product. The circumstances that generate a certain distribution of organizational types in a particular industry

⁴ See Weisbrod (1988), Ben-Ner and Van Hoomissen (1991) and Hansmann (1996) for 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.

⁵ Dreze and Hagen (1978) show that the relations between a firm and its consumers and the relations between a firm and its workers are formally equivalent.

and market may change, but because various forces of inertia the distribution may be sustained over long periods of time. Thus different organizations may serve different consumer niches.

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

In a narrow sense, organizational performance reflects attainment of organizational (principals') objectives. More broadly, organizational performance also includes the organization's effect on social welfare through its impact on the well-being of various stakeholders that interact with it. Performance may vary across types of organization because of differences in objectives, in the manner in which objectives are pursued, and in the employees that choose to work for them.

Conceptually, organizational objectives can be deduced from the identity of the principals who control an organization. In the case of for-profit firms, the principals are equity owners; in general, they seek the best returns on their investments, suggesting the goal of profit maximization. In nonprofit organizations, the principals may be consumers who feel that for-profit provision is unsatisfactory, given economic constraints, and prefer to run an organization that pursues the goal of consumer well-being, however that may be defined.⁶ The principals may be individuals or organizations who care about the actual consumers, such as cultural associations, religious groups, foundations and local government, who will pursue goals that may be focused on actual consumers' (beneficiaries') well-being and possibly other goals.⁷ So nonprofit and government organizations will pursue a diverse set of objectives as compared to the specific profit goal of for-profit firms.

⁶ For example, in Rochdale, England local stores were suspected of selling adulterated foodstuff (milk diluted with water, flour mixed with aluminum to whiten it or potatoes mixed with limestone to bulk it up), exploiting the fact that it was not easily discernable from unadulterated foodstuff; 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. The Rochdale Society's principles have become the principles underlying the operation of consumer cooperatives worldwide (Enke, 1945).

⁷ Some 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; religious groups may emphasize the provision of local public goods to their co-religionists by supplying a suitable religious environment; and government organizations will, often by law, provide services with universal access and will have additional objectives associated with different citizen and lobby groups. For a discussion of circumstances when government rather than private groups will engage in provision, see Ben-Ner and Van Hoomissen (1991).

Will different types of organization pursue their respective goals with equal effectiveness? In an influential paper, Fama and Jensen (1983) suggested that founders and controllers of nonprofit and government organizations will be less effective principals than their for-profit counterparts because they do not have financial stakes in their organizations, and therefore that agency problems will be more severe and efficiency will be lower in nonprofit and government organizations than in for-profit firms. 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. Government organizations, with more layers of quasi-principals (bureaucracy) and even more diluted incentives than in nonprofit organizations, may suffer from even lower efficiency. The nonprofit and government problem thus starts with managers who invest too little effort in planning, in the design of strategy, in ensuring that workers do their best to advance organizational objectives, and in other managerial duties. A further and significant complication arises from the fact that 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. This makes it trickier to hold managers and employees fully responsible for performance that cannot be clearly contrasted with objectives.⁸ This perspective suggests that nonprofit and government organizations are likely to be less-well managed than for-profit firms.

It is sometimes argued that nonprofit and government organizations attract individuals, particularly in managerial roles, who prefer to work in organizations they regard as more ethical, socially-responsible, publicly-minded, and that do not exploit various disadvantages consumers may suffer.⁹ Workers and managers who self-select into organizations may work harder on behalf of their objectives than what their incentives alone would call for, compensating for some of the more severe agency problem.

⁸ Alternative objectives are adopted because these organizations eschew profit maximization to overcome market failures. The objectives of government organizations are likely to be even more complex and shifty than those of nonprofit organizations because of the large number of different groups that vie for influence, and because the relative power and influence of these groups may vary over time. For a comparative discussion of objectives of for-profit firms and nonprofit organizations in the hospital industry, see Roomkin and Weisbrod (1999).

⁹ This is a common argument advanced by workers and managers in the nonprofit sector and to a lesser extent in government. As an indication of the intrinsic motivation of workers in the nonprofit sector, studies have attributed the documented lower wage accepted by these employees to the “donated labor” hypothesis, suggesting that employees in nonprofit sector derive their well-being from the production of goods that are different from those produced by their for-profit counterparts (Leete, 2006; Preston, 1989; Roomkin and Weisbrod, 1999).

An organization's output is usually thought of in terms of quantity, but there are other important attributes. Depending on the specific product, these attributes may include quality, durability, reliability, effectiveness in accomplishing its stated purposes, emotional satisfaction derived from the relationship between consumer and producer, and more. Different types of organization may emphasize differentially various attributes, depending on the opportunities different attributes present for the pursuit of their objectives. A crucial condition that affects the opportunities for pursuit of organizational objectives is associated with asymmetric information between producer and consumer concerning various attributes of the product. Asymmetric information is an important factor in situations where the quality, reliability, durability and effectiveness of the product are not immediately apparent, and where the materialization of these attributes depends partly on consumer behavior and characteristics. These elements are particularly relevant in personal services and health care, where some decisions are made by persons other than the direct consumers (e.g., parents of children in day care and family members and insurers in the case of many nursing home residents) and where many factors other than just the efforts of the provider affect outcomes. In these cases the asymmetry of information concerns the difference in information between the producing organization and decision-makers who may be able to obtain some but not sufficient or reliable information from the direct consumers. As a very large literature in economics has shown, asymmetric information between parties to an interaction provides diverse opportunities to pursue the objectives of one party at the expense of its counterparts. We therefore use the degree of observability of a particular attribute of a product by consumers or those who make decisions on their behalf as a measure of asymmetric information between provider and consumer in nursing homes with respect to that attribute. In addition, given the centrality of the relationship between providers and residents and the variability of its emotional satisfaction, we use this as an additional dimension of service for the purpose of characterization of possible differences in performance among types of organization, with particular reference to nursing homes.

Quantity, such as the number of residents served by a nursing home, is the primary element used to characterize products in economics. This is generally a fully observable element because each consumer (of private goods) knows precisely the quantity of his or her consumption; in the nursing home case each consumer (resident or a decision-maker on behalf of a resident) knows of one's status as nursing home resident.

The *observable* elements of a product are those for which there is little asymmetric information between the producer and consumers; for example, in a nursing home this concerns features such as the size of residents' rooms, the quality of food, the appearance of facilities and the ratio of nursing staff to residents, which may be fairly easily observed. Competition should drive organizations of different type to provide similar levels of this dimension, with consumers gravitating to higher-quality providers.

The *unobservable* elements of a product are subject to considerable asymmetric information between a better-informed provider and consumers. For example, in a nursing home partially incapacitated residents may have limited ability to judge the details of the services and treatments they receive separately from the effects of their own specific medical condition; furthermore, such individuals may also be unable to articulate and communicate their needs and the treatment they receive to members of their family who are themselves not in a position to evaluate the needed and received care.¹⁰

Providers of a service may be able to provide little of the unobservable elements even if they are desired by consumers because they cannot observe actual delivery.¹¹ For-profit firms have a financial motive to undersupply these elements because their production is costly. Nonprofit and government organizations' commonly stated objectives can rarely induce them to seek to take advantage of consumers' informational disadvantage, as often they seek to remedy market failure associated with asymmetric information. Indeed, a central theory of nonprofit organizations considers their emergence as a response to the market failure caused by asymmetric information by providing trustworthy services to customers (Arrow, 1963; Hansmann, 1980; Hirth, 1999).

However, if nonprofit and government organizations' objective is to provide their product to the largest possible number of consumers who may otherwise not have access to the product, then they may undersupply unobservable elements in order to shift resources to provide a larger quantity.¹² Undersupply may also arise if, in the shadow of severe agency problems, employees

¹⁰ Weisbrod and Schlesinger (1986) array products in terms of asymmetric information along the spectrum between easy-to-monitor and hard-to-monitor. Our classification of observable and unobservable quality dimensions is an extension of their framework.

¹¹ How little they can provide depends on how the unobservable elements are co-produced with observable elements, whether the degree of unobservability varies across consumers, and, of course, the willingness of employees to cooperate in the undersupply of these elements.

¹² This objective does not fit the nursing home industry because poor individuals' care is largely covered by Medicaid.

may shirk their responsibilities in areas in which negative effects are hard to observe, or managers may divert resources to show visible results that are valued by donors or higher levels of government.¹³ Although the possibility of undersupply of unobservable elements by nonprofit and government organizations exists and therefore the difference between them and for-profit firms cannot be theoretically signed, we expect that *bona fide* nonprofit and government organizations will provide higher levels of unobservable elements, especially if self-selection by employees eliminates gross undersupply of such elements by shirking employees.

Personal services and health care, among other products, contain a *relational* or *affective* element, reflecting the strength of bonds, concern, exhibited empathy and emotional connections between providers and consumers (Gui, 2005). This element is unobservable by those who are not direct consumers because it has no physical correlates and if direct consumers are not able to convey their emotional experiences then those who make decisions on their behalf cannot judge how well this element is provided. The relational element is likely to be provided better by nonprofit and government organizations that are concerned with consumers' well-being than for-profit firms that may divert resources from this element, for example, time spent in personal exchanges with consumers, to elements that are observable. However, considerations listed above may limit or even annul the extent of this difference.

The level at which each of these elements is provided to consumers affects their well-being in straightforward ways, so that an organization that performs better on these four elements improves social welfare. If performance is not uniformly superior then ranking of relative performance is impossible, or requires additional assumptions about the value of tradeoffs between different elements. We return to this issue in empirical part of the paper.

(c) Organization type and organization structure

Organizations adopt various measures to direct employees' efforts towards organizational objectives. These measures are captured by organization structure (design), including the allocation of decision-making, provision of incentives, monitoring, evaluation, selection of new workers and more. There are many factors that affect the choice of organization structure, including the nature of the product, industry, type of organization and other factors (Ben-Ner,

¹³ The asymmetric information problem that affects adversely consumers may be present in the principal-agent relationship, too, allowing managers and workers to do things that principals would not approve of; however, this is *not* an element that differentiates across types of organization.

Montias and Neuberger, 1993). Here we are concerned with differences associated with the type of organization.

The primary decision concerns the allocation of decision-making, with other elements of organization structure supporting the effectiveness of a particular allocation (Prendergast, 2002; Ben-Ner, Kong and Lluís, 2007). Decisions may concern the immediate tasks of a worker, a group of workers, a unit, or the entire organization. Nonprofit and government organizations are more likely than for-profit firms to delegate decisions to workers, especially to their key workers, as a result of the vacuum created by less involved principals due to the agency problems discussed earlier (Pauly and Redisch, 1973; Glaeser, 2003). On the other hand, but working in the same direction, to the extent that workers self-select into these organizations because they are attracted by their objectives, they will be trusted more and will be permitted a degree of decision-making autonomy not afforded to their counterparts in for-profit firms. Furthermore, if the relational element represents an important objective, then nonprofit and government workers will enjoy greater autonomy of decision-making because the deployment of affect cannot be directed effectively by third parties. Hence the expectation is that nonprofit and government workers will enjoy greater decision-making autonomy than their for-profit counterparts.

Decision-making authority must be supported by appropriate motivation to ensure that it is exercised in support of the organization's objectives. There are several practices that may complement delegation of decision-making: incentives tie workers' short or long-term rewards to their actions, monitoring is used by managers to ensure that workers do what they are supposed to do, and new workers are selected according to their anticipated predilections to act in accord to the organization's interests and according to their abilities.

Workers who self-select into an organization because of their support of its mission require less incentives or monitoring to ensure compliance with the organization's objectives than otherwise. However, self-selection may actually reflect adverse selection, with *all* job applicants likely to affirm their belief in the hiring organization's mission and vision. In a job market where the quality of information about job applicants is "subtle, nuanced and difficult to verify," social networks become preferable sources to impersonal ones to obtain reliable information (Granovetter, 2005: 33). Therefore, to screen applicants for their belief in an organization's mission may rely primarily on their current employees, who may tap their own

social networks to identify new key workers. Current employees may know their acquaintances' values in ways that screening by human resources staff cannot replicate.

Careful selection for congruence of values may alleviate the agency problems faced by nonprofit and government organizations but it is unlikely to be sufficient, so that incentives and/or monitoring will also be employed. Incentives will be employed to the extent that there exist useful measures of performance that are closely linked to organizational objectives. In for-profit firms managers and lower-level employees can be compensated relative to firm profits (e.g., through profit sharing or stock ownership). In contrast, nonprofit and government organizations have broad and often complex objectives concerning various facets of the product and, akin to the problem of incentives in multi-tasking situations (Holmstrom and Milgrom, 1991), cannot offer their managers simple incentive schemes (Roomkin and Weisbrod, 1999). The issue of feasibility of incentives filters down through the organization, leading to the prediction that for-profit firms will rely more heavily on incentives than their nonprofit and government counterparts. Instead of relying primarily on financial incentives, these organizations may rely on an efficiency-wage mechanism through provision of a higher-compensation package supported by stricter monitoring.¹⁴

(d) Pressures for similarities in structure and performance across organizations

The factors associated with organization type discussed above tend to generate differences in structure and performance. However, there are also strong pressures for similarity. In the boundary case that no consumers use organization type as a signal of the desirability of provision of unobservable 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 will be forced to do so, because if they do not they would have to subsidize the provision of the unobservable elements from other sources.¹⁵ Competition will force organizations to provide relatively similar combinations of product dimensions of interest to consumers (Steinberg, 1987). Government regulation is another force towards similarity in

¹⁴ Monitoring may also complement certain types of incentives. For a more comprehensive examination of the relations among different elements of organization structure, see Ben-Ner, Kong and Lluís (2007).

¹⁵ This is, of course, a typical Akerlof-type 'lemons' problem (Akerlof, 1970) whereby bad products squeeze out good products. In the opposite limiting case, where all consumers are aware of the problem of asymmetric information and are using organization type as a signal of trustworthiness, consumers will tolerate tradeoffs between observable and unobservable dimensions so that for-profit firms will provide higher levels of the observable dimensions than their nonprofit and government counterparts.

performance; in nursing homes, for example, various federal, state and local agencies establish and seek to enforce uniform practices and minimum standards of care. Professional workers who receive similar training, are members of similar professional organizations and move across types of organization within the same industry constitute another force pushing towards similarity in structure (DiMaggio and Powell, 1983).

Similarity may also arise from broad economic, technological and other developments that reduce the demand for alternative types of organization. Whereas historically-specific market failures have given rise to different types of organization, these may have changed with increased availability of information, competition, regulation, and other factors that weaken the need for different types of organization (Ben-Ner, 2002). Organizations of different types may grow increasingly alike in both structure and performance, although they may retain their initial designation of type due to various forces of inertia.

III. Data and Variables

In this section we describe the nursing home industry and discuss the datasets and variables used in the two sets of estimations, one concerning organization structure and the other organizational performance. Variable descriptions and statistics are in Table 1.

(a) Nursing homes

The study focuses on nursing homes of the skilled-facility variety 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 more. In addition, this focus permits the assembly of a uniquely detailed dataset, culled from various state sources and supplemented with a survey administered to executives. Because nursing homes are generally small organizations, the information reflects the circumstances of homogeneous organizations, in contrast with the diverse circumstances of larger organizations where practices may differ considerably across sites and departments.

A nursing home is a residence for individuals with physical or mental problems that prevent them from living on their own. Residents receive meals and assistance with daily activities as well as medical care (but not of the intense kind provided by a hospital). The

average nursing home in Minnesota has 88 certified beds. Most nursing homes operate independently and separately from hospitals, but 16% 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. Most nursing homes in Minnesota are operated as nonprofit organizations (65%); other homes are for-profit (21%) and government-owned (14%). They may be part of a chain or be independent facilities.

Nursing homes are subject to state and federal (Centers for Medicare and Medicaid) regulations that prescribe certain minimum practices concerning care, housing, food and more as well as collect information about residents, staff, quality of care and other matters; regulators perform both scheduled and unannounced inspections to ensure compliance.¹⁶ Regulations, inspections, data collection and dissemination and other means are required because residents are typically frail and vulnerable individuals who often enter a nursing home under the duress of a medical event that necessitates removal from their own homes. Residents and their families are commonly in a position of disadvantage because, for reasons of limited cognitive capacity (residents) and distance and frequency of contact (families), asymmetric information favors the providers of nursing home care. For example, most residents cannot object effectively to being medicated with sedatives in order to make them more pliant or to being put to bed early, and family members cannot observe the substantive aspects of the care their relatives receive, thus being reduced to observe facilities and other factors that can be gleaned during visits but which may have only little to do with the nature and quality of care.

Most observers agree that regulation raises the standards of care beyond that would prevail otherwise, and improvements in data collection and enforcement have dramatically changed the situation as compared to that reported by Vladeck (1980). However, the problem of asymmetric information runs deep and it is hard even for professionally-trained observers to detect all problems. In its December 2005 report to the US Congress, the Government Accountability Office summarizes some of its findings as follows. “In the five large states we reviewed, federal surveyors concluded that the state surveyors had missed serious deficiencies in

¹⁶ Practically all nursing homes have residents who benefit from the federal Medicare and Medicaid programs hence they are all subject to these regulations. “Under contract with the Centers for Medicare & Medicaid Services (CMS), states conduct annual nursing home inspections, known as surveys, to assess compliance with federal quality and safety requirements. States also investigate complaints filed by family members or others in between annual surveys. When state surveys find serious deficiencies, CMS may impose sanctions to encourage compliance with federal requirements” (GAO, 2005).

from 8 percent to 33 percent of comparative surveys—that is, these deficiencies existed and should have been identified at the time of the state survey... [A] sample of deficiencies demonstrated considerable understatement of quality-of-care problems such as serious, avoidable pressure sores.” Moreover, enforcement is imperfect, so that homes found to violate regulations, even if they have done so repeatedly, are not always penalized (GAO, 2007).

Furthermore, nursing homes provide a personal care to individuals who find themselves in unfamiliar surroundings in the company of strangers around the clock and dependent on others – the nursing staff as well as other residents – for most of their physical, social and emotional needs. This relational element is likely to be important to residents but largely invisible to outsiders, including regulators and family members, and difficult to communicate for reasons discussed earlier as well as because of the ‘subjective’ nature of this dimension.

(b) Organizational performance dataset and variables

Our performance data are drawn from regulatory sources concerning all nursing homes in Minnesota: (1) Online Survey, Certification, and Reporting database of the federal Centers for Medicare and Medicaid Services (OSCAR), and (2) Minnesota Department of Human Services (DHS). The OSCAR dataset provides information about nursing home organization type, capacity, nursing inputs, violation of regulations, health condition of residents, and more; the data are collected in accordance with federal laws and regulations, supplemented by Minnesota laws and regulations.¹⁷ DHS data include nursing home residents’ assessment of nursing home quality, satisfaction and more derived from a survey administered to a sample of residents in every Minnesota nursing home.¹⁸ The survey contains 13 measures of resident satisfaction, each measure consisting of multiple items, aggregated into a home rating for each measure, after accounting for the case-mix of a home’s residents.¹⁹ The OSCAR and DHS datasets were merged to provide data for estimation of cross-sectional performance equations at the individual home level in 2006; we have 313 homes with observations for all the required variables, of

¹⁷ The OSCAR data are described in many places; see, for example, GAO (2005).

¹⁸ Minnesota is one of a few states that administer such a survey; the first survey was administered in 2005.

¹⁹ The 13 measures include the four aspects mentioned in the text (comfort, dignity, autonomy and individuality) as well as environmental adaptations, privacy, dignity, spiritual well-being, meaningful activity, food enjoyment, security, relationships, satisfaction, and mood. Residents are interviewed during a site visit and are asked to respond in one of the three manners: generally yes, generally no, and don’t know/not applicable/no response. All measures are adjusted to reflect resident health condition.

which 66 are for-profit, 202 are nonprofit, and 45 are government owned.²⁰ We also linked 2000 U.S. Census data on each nursing home's ZIP code area including the degree of urbanization, average income, and age composition of the local population.²¹ Detailed description of the variables, descriptive statistics, and sources are presented in Part I of Table 1.

We have several organizational performance measures, seeking to capture quantity, different degrees of observability, and relational elements. We describe the performance measures below.

The number of residents is the measure of quantity.²² The average home in our sample has 82 residents, the smallest 15 residents, and the largest 458 residents.

The deficiency citations variable is the sum of 28 deficiency categories with 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. The mean number of citations is 13, with 16 homes having no citations; the maximum number of citations is 39. This variable represents an aggregation of elements that some are more and others less observable by family members, but can be unearthed through careful study through regulatory inspections. Although the data have been made public recently, it is likely that their effect on the behavior of nursing homes will not have yet taken full effect.²³

²⁰ We obtained the OSCAR dataset from the Medicare.gov website that contains home inspection data up to January 2007. The DHS home rating data were collected during the period between the fourth quarter of 2005 and the third quarter of 2006. The DHS resident interview was conducted in July to August 2006. To match up the two data sources, we extracted home inspection data from OSCAR in the time frame between November 2005 and December 2006. For those homes that were inspected twice during the period, we used the information from the later inspection. We were able to match up the 313 homes from both data sources with complete information for analysis of home performance.

²¹ Although we do not have information about the areas from which a particular home's residents are drawn, generally residents are drawn from locales near the nursing home. We use population characteristics in a home's ZIP code to approximate the characteristics of the population from which the home's residents are drawn.

²² The number of residents is a count at the time of the OSCAR survey. (Another common measure is the annual number of "patient-days" (e.g., McKay, 1988).

²³ Data on individual homes drawn from regulatory inspections were made public on the internet in 2004 and will likely alleviate some of the asymmetric information and affect the decision-making of some consumers. However, at present the effect appears to be very small. A focus-group study conducted by the U.S. Department of Health and Human Services (2006) reports that patients and their family members were generally unaware of or found it difficult to use sources such as Medicare's Nursing Home Compare site to facilitate the home selection process in a timely fashion.

We constructed two measures of *relational elements* from DHS data. The first measure (“relationship”) captures the degree to which residents report that there is a social, emotional and affective relationship between them and nursing staff as well as other residents (mean of 82.10, minimum 66.32 and maximum 90.14). The second measure (“satisfaction”) captures the extent to which residents are satisfied with their relationships in the nursing home (mean of 81.96, minimum 71.89 and maximum 89.92). These elements are unobservable to family members. The items that underline these measures are detailed in Table 1.

The proportion of residents with back pressure sores is reported to regulators by nursing homes. Pressure sores occur because immobile residents remain for a long time in the same position in bed, chair or wheelchair, because of improper nutrition or because of deficient preventive care (e.g., failure to use padding). Pressure sores have been used in the literature as an indicator of nursing home quality that is unobservable to family members, particularly of immobile residents (e.g., Cawley, Grabowski and Hirth, 2004; Grabowski and Hirth, 2003). We use the proportion of high-risk long-stay residents who have pressure sores as an alternative measure of the unobservable quality dimension. The mean proportion is 7.85%, with minimum and maximum of 0% and 22%, respectively. However, this variable is available only for 221 homes due to the fact that small nursing homes are not required to report it and missing information for a few other homes.

We constructed three additional variables from DHS’ resident surveys, attempting to capture elements that are comparatively observable to residents’ families. One variable, “*security*,” represents the degree to which residents feel that they and their belongings are safe at the nursing home. “*Food enjoyment*” is a variable that measures food enjoyment, and “*environmental adaptations*” measures the extent to which the immediate physical environment of the resident is comfortable.

Control variables. We control for various variables, including resident case-mix (‘risk factor’),²⁴ hospital affiliation, the proportion of Medicare residents, market competition,²⁵ and demographic variables representing the home’s geographic area.²⁶

²⁴ 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.

²⁵ The degree of market competition a nursing home faces is measured by the Herfindahl-Hirschman Index within the county where the nursing home is located. For each nursing home we computed the ratio of the number of residents in the home to the total number of residents in all nursing homes within the home’s county; the total number of nursing home residents in the county proxies for total market demand.

(c) Organizational structure dataset and variables

In order to obtain information about elements of organizational structure we administered the Minnesota Nursing Homes Employer Survey (MNHES). The survey was administered to all nursing homes identified in the OSCAR database in late 2005, with follow-up surveys mailed to non-respondents twice in the spring of 2006. Of the 399 nursing homes listed in the 2006 OSCAR database, 120 responded to the survey, although because of missing information for different variables the usable sample size is only 82.²⁷ Among the 82 homes, 54 are nonprofit, 13 are for-profit, and 15 are owned by governments.

The survey was addressed to nursing home administrators and requested detailed information concerning ownership, residents, various practices and more.²⁸ A series of questions addressed practices aimed at core employees, the nursing staff: registered nurses, licensed practical nurses and certified nursing assistants. On the basis of responses to these questions we constructed five variables that represent organizational structure that affects the work of the nursing staff, described in detail below with additional information presented in Table 1, Part II. The measures below, with the exception of delegation of decision-making, represent weighted averages of survey responses reflecting each nursing group separately; the weighting is based on the number of registered nurses, licensed practical nurses and certified nursing assistants.²⁹

Delegation of decision-making. The variable was calculated from information about the degree of influence employees have in seven areas: hiring of nursing staff, hiring of the executive director, expansion of facilities, change in services, menu planning, choosing of activities for residents, and determination of standards of care. The variable was constructed by

²⁶ 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.

²⁷ We conducted nonparametric Mann-Whitney test comparing the 82 homes to those left out of analysis on the variables of organizational structure, home characteristics and external environment. We did not find statistically significant differences in most of the variables except for home age, the wage of registered nurses, and population density in the county area.

²⁸ The survey is at <http://webpages.csom.umn.edu/hrir/abenner/web/papers/work-surv/Nursing-homes-survey.pdf>.

²⁹ Delegation of decision-making was constructed from responses that already lump together all nursing staff. We conducted the analysis also separately for types of nursing staff, with very similar results to those reported here.

taking the average of the seven items, each ranging from 1 (*not at all*) to 5 (*extreme*). The sample mean is 1.99, with a standard deviation of 0.47.

Selection. We asked about the main way for recruiting nursing staff, including ‘cold call’ by candidates, newspaper ads, online job services, referral by current employees, employment agencies and so on. We concentrate on referrals by current employees as an indicator of selection of employees through social networks. In our sample, 30% of nursing homes rely mainly on referrals.³⁰

Merit-based pay raise. In nursing homes, nurses work in teams so that the individual contribution to overall quality of care is impossible to observe and measure directly and therefore standard pay-for-performance incentives cannot be used.³¹ Instead, nursing homes that do seek to use incentives tend to rely on merit-based pay raises. In our sample, 26% of homes rely on merit as one of two primary criteria for pay raises for nursing staff.

Fringe benefits. Another form of providing incentives is efficiency wage, represented by higher-than-market pay. We compared the hourly wage of each group of nursing staff between nonprofit, government and for-profit nursing homes. Except for the registered nurses’ wage, where government homes pay 8% more than for-profit homes at a 0.10 significance level, we found no significant differences. However, total compensation also includes fringe benefits such as pension plans, health insurance, paid vacation leave and paid sick leave. These fringe benefits may serve as the premium that provides additional incentive to employees on top of wages. The variable of fringe benefits is coded as the count of items implemented with a range from 1 to 4. The mean number of fringe benefits is 3.64, with a standard deviation of 0.61.

Monitoring. The variable is based on the extent to which the work of nursing employees is monitored and supervised by supervisors and managers, ranging from 1 (*not at all*) to 5 (*extreme*). The sample average is 3.81, with a standard deviation of 0.74.

IV. Empirical Strategy and Results

(a) Organization structure

³⁰ Several homes indicated more than one main recruiting method, so if they included employee referral we classified them as selection through referral by current employees.

³¹ This was also reflected in the responses to the open-ended survey question about incentives.

We implement empirically the theoretical framework developed in Section II (c) with the following model:

$$(1S) \quad \textit{Delegation} = f(\textit{OT}, \textit{X}, \textit{P}, \mathbf{u}_1)$$

$$(2S) \quad \textit{Selection} = g(\textit{OT}, \textit{X}, \textit{Q}, \textit{Delegation}, \mathbf{u}_2)$$

$$(3S) \quad \textit{Fringe benefits} = h(\textit{OT}, \textit{X}, \textit{R}, \textit{Monitoring}, \textit{Delegation}, \mathbf{u}_3)$$

$$(4S) \quad \textit{Monitoring} = i(\textit{OT}, \textit{X}, \textit{S}, \textit{Delegation}, \textit{Selection}, \textit{Fringe benefits}, \mathbf{u}_4)$$

$$(5S) \quad \textit{Merit pay} = j(\textit{OT}, \textit{X}, \textit{Delegation}, \textit{Monitoring}, \textit{Fringe benefits}, \textit{Selection}, \mathbf{u}_5)$$

where $(\mathbf{u}_1, \mathbf{u}_2, \mathbf{u}_3, \mathbf{u}_4, \mathbf{u}_5)$ is quint-variate normal $N(0, \Sigma')$, Σ' is non-diagonal assuming correlation in the disturbance terms across equations, \textit{OT} is a set of dummy variables representing organization type (for-profit, nonprofit and government), \textit{X} contains all the control variables of nursing home characteristics used in every equation, \textit{P} , \textit{Q} , \textit{R} and \textit{S} include variables used only in the relevant equation. To account for the simultaneous determination of the various elements of structure and the presence of common unobservable factors that affect them, we use three-stage least squares estimation.³²

We control for several nursing home characteristics that may affect their choice of organization structure. These characteristics include home size measured by the total number of residents, case mix, and whether the nursing home is affiliated with a hospital. We also include the county-level Herfindahl-Hirschman market concentration index to account for possible pressures or opportunities for learning that may drive nursing homes to adopt similar structures. To address the endogeneity of the elements of organization structure, we use instrumental variables for each element included in the estimation of another element.³³

³² We also performed benchmark system estimations without accounting for endogeneity, and single equations that do not control for either endogeneity or simultaneity. The results based on these estimations are very similar to those reported below.

³³ For delegation of decision-making we use home age (older age is likely to indicate a more traditional management style and consequently less delegation of decision-making); for network selection we use the population density in the county in which a home is located (tightness of family or friendship networks that can be relied on selection of new employees is likely to be positively associated with physical proximity associated with population density); for fringe benefits we use wages for each nursing group (wages are positively related to the level of provision of fringe benefits); for monitoring we use the degree to which supervisors are able to tell how well nurses are carrying out their tasks. All the instruments described above are significantly correlated with the variable for which they instrument but not with other dependent variables.

Table 2 shows significant differences in organization structure across organization types, generally in the direction predicted by theory. The estimates of the relationships among the elements of organization structure, although not of interest in the present paper, are consistent with theory (Ben-Ner, Kong and Lluís, 2007), suggesting that the specification in equations (1) - (5) is reasonable. Nonprofit organizations and government homes adopt significantly higher levels of delegation of decision-making, more fringe benefits, greater degrees of monitoring, and rely more on social-network selection of new employees, than do for-profit homes. We do not find significant differences across types of organization in reliance on merit-based pay (although the sign is in the predicted direction).

(b) Organizational performance

We implement empirically the theoretical discussion in Section II (b) of organizational performance across organization types as follows:

$$(1P) \text{ Number of residents} = f(OT, NI, T, v_1)$$

$$(2P) \text{ Deficiency citations} = g(OT, NI, U, v_2)$$

$$(3P) \text{ Satisfaction} = m(OT, NI, Z, v_8)$$

$$(4P) \text{ Relationship} = n(OT, NI, Z, v_9)$$

We adopt a partial Cobb-Douglas production function framework for all the estimations to account for the input of nursing staff (*NI*) in producing nursing home outcomes, with augmentation by organization type (*OT*) and employing controls for various factors (*T, U, Z*). The production function is partial because we do not include the inputs of non-nursing labor and capital.³⁴ To account for the simultaneity of the choice of the multiple dimensions of performance we use two-stage least squares (seemingly unrelated) regressions.

Table 3a reports the results for estimation of system (1P)-(4P). The first column, the quantitative element that measures efficiency in the standard fashion, shows that for-profit homes outperform both types of nonprofit and government homes. The difference is highly

³⁴ To understand the significance of the omission of other inputs, note that we are using the separate inputs of three different types of nursing staff, from highly-trained registered and licensed nurses to certified nursing assistants, who together account for 66% of nursing homes employment (Gabrel, 2000); nurses' combined wages account for about 81% of nursing home revenue in our sample.

significant, indicating 6.6% lower productivity in nonprofit homes and 11% lower productivity in government homes, as compared to for-profit ones.³⁵ Deficiency citations are fewer in nonprofit homes than in for-profit homes (significant at the 0.1 level), while the difference between government and for-profit homes is insignificant. Residents of nonprofit homes report higher satisfaction levels than residents in for-profit homes; again, the difference between government and for-profit homes is insignificant. Finally, the relationship variable shows advantage in both nonprofit and government homes relative to for-profit ones. These findings support our theoretical hypotheses. If we think of the four dependent variables in terms of representation of elements in terms of their observability decreasing as we move from the first column towards the fourth, then the results support the notion that nonprofit organizational performance relative to for-profit performance increases as unobservability increases.

Table 3b reports estimation of system (1P)-(4P) where the satisfaction variable is replaced with the back pressure sores variable. As noted earlier, using this variable cuts the number of observations from 313 to 221. The results are rather similar to those reported in Table 3a. In Appendix 1 we attempt another set of measures, this time replacing the number of deficiency citations with three variables that arguably reflect increasing degree of unobservability, from security (of residents and belongings), to food enjoyment to environmental adaptation to the needs of residents. Again, we find that efficiency is lower in nonprofit and government homes, security and food enjoyment are not significantly different in nonprofit and government homes as compared to for-profit ones, but environmental adaptations are perceived by residents as superior; the satisfaction and relationship variables show again better results for nonprofit homes as compared to for-profit ones, and for relationship, in government versus for-profit homes.

In the foregoing discussion we have treated for-profit, nonprofit and government organizations as prototypical organizations and ignored possible variations within each type that may affect the severity of agency problems as well as organizational objectives. For example, a for-profit home that belongs to a chain may experience more severe agency problems than an owner-controlled local home; likewise, the operations of a locally-controlled nonprofit organization may be more visible to its board and stakeholders and its objectives may be more

³⁵ The estimate on the combined inputs of registered and licensed practical nurses is 0.469 (S.E. 0.027) and certified nursing assistants' input is 0.461 (0.024).

aligned with community desires than would be the case with a large organization that has facilities in many communities. Furthermore, secular homes may perform differently from religious homes. We performed the analyses reported above, distinguishing between chain and autonomous for-profit and nonprofit homes, and found no significant differences between the for-profit and nonprofit effects already reported here (nor between chain and autonomous homes of either organization type). Likewise, splitting the nonprofit sample by secular and religious homes produced no significant differences.

V. Discussion and Conclusions

In this paper we proposed a comparative theoretical perspective on the structure and performance of for-profit, nonprofit and government organizations. We argued that in a market economy such as that of the US, the existence of types of organization other than for-profit firms is likely to reflect responses to various ‘market failures.’ As such, nonprofit and government organizations are expected to have different objectives, ownership structures, and employees than for-profit firms in similar product lines. Concerning organization structure, we claimed that nonprofit and government organizations will delegate more decision-making to their employees, but will have to support such delegation (in order to ensure that employees work on behalf of organizational objectives) with more monitoring, efficiency wages, and social network selection than their for-profit counterparts because they cannot rely on variable financial incentives.

Our empirical investigation of a sample of 82 nursing homes in Minnesota, using information from a survey we administered, supports strongly these predictions. As compared to for-profit nursing homes, nonprofit nursing homes delegate more decision-making to their nursing employees, select them more through social networks of current employees (presumably reflecting similar values), monitor more their nursing employees, and while providing similar wages, they provide more generous fringe benefits, amounting to paying efficiency wages. There is little research against which we can compare these findings. The extant literature has focused on comparisons of wages, with extremely few exceptions, De Varo and Brookshire (2007), who investigate differences in promotion practices in for-profit firms and nonprofit organizations.

Concerning performance, we argued that for-profit firms offer stronger material motivation to principals as well as to a succession of their agents, than nonprofit and government organizations. This is likely to generate more severe agency problems in nonprofit and

government organizations, resulting in lower efficiency than in for-profit firms. A countervailing factor is created by the possible self-selection of some managers and workers into nonprofit and government organizations in order to support their social orientation. Importantly, the objectives of nonprofit and government organizations are centered on consumer well-being, which favors actions that improve provision of the product, as compared to the profit goal of for-profit firms, which may call for actions that may be detrimental to consumer well-being but promote profit, such as taking advantage of asymmetric information that favors the producer at the expense of the consumer.

Our empirical investigation of a sample of 313 nursing homes in Minnesota, using data collected by regulatory agencies, provides support for our theoretical predictions. Nursing homes provide services that have elements that are observable by consumers or their sponsors (residents or their families) as well as elements that are not observable at least by sponsors. In the framework of production function estimation we find that for-profit homes are more efficient than nonprofit, and even more so than government, homes. However, government, and especially nonprofit homes are better, from the point of view of residents' well-being, at the provision of elements that are less well observed by residents and their families. Our findings are similar to findings from the nursing home and hospital industries that for-profit firms are more efficient than nonprofit ones (Nyman and Bricker, 1989, and Kessler and McClellan, 2002). However, Horowitz (2005) finds that nonprofit hospitals produce less profitable services than for-profit counterparts, consistent with differences in objectives; Weisbrod and Schlesinger (1986), Spector, Selden and Cohen (1998), Hirth (1999), Chou (2002), Grabowski and Hirth (2003) and Santerre and Vernon (2005) find that nonprofit nursing homes provide services in a way that exploits less consumer informational disadvantages than do for-profit homes.

The results for organizational structure and performance are consistent with the view that the nonprofit and government organizations have more consumer-oriented objectives than for-profit firms and that they *may* have more severe agency problems. The question of the severity of agency problems has to be studied in further detail, perhaps with data collected at the level of individual employees, in order to differentiate it from the possibility that nonprofit and possibly government organizations trade quantity for higher quality service – fewer regulatory deficiencies, and better provision of relational goods, in the context of nursing homes.

The advantages of focusing on a single and narrowly-defined industry such as nursing homes are clear: there are few sources of unobservable and uncontrollable variation that may be held responsible for differences in structure and performance across types of organization. Our theoretical framework allowed us to approach the questions of organizational structure and performance from a unified perspective and to account for various interdependencies in the context of a single product.

Can our findings be generalized to our industries? An initial point of this paper has been about the endogenous formation of alternatives to for-profit firms, conditional on which we asked whether alternative types of organization will be organized differently and perform differently. If at all generalizable, these findings would apply only to nonprofit and government organizations that arise to deal with problems not addressed well by for-profit firms. Nonprofit and government organizations may exist for essentially non-economic reasons; we have not expanded this possibility into a theory of structure and performance with parallel hypotheses to the ones we did develop. However, this is an interesting topic for further research.

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. On the long run, with Internet information about nursing homes already available and more to become available in the future, and with the increase of public's awareness of and ability to use these online information, 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.³⁶

³⁶ 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 in various forms such as nursing home report card.

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Table 1. Variable Definitions, Sources and Summary Statistics

<i>Variable Name</i>	<i>Variable Definition</i>	<i>Mean (Std. Dev.)</i>	<i>Data source¹</i>
I. Variables for Organization Performance Estimations - 313 Nursing Homes			
<i>Type</i>			
	1- nonprofit & member of chain, 0-otherwise	0.35	OSCAR
	1- government, 0- otherwise	0.14	OSCAR
	1- for-profit, 0- otherwise	0.21	OSCAR
<i>Performance</i>			
Residents	Total number of residents	82 (49)	OSCAR
Citations	Total number of deficiency citations. 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..	13.24 (6.73)	OSCAR
Environment	Items: “Are your belongings safe here?” “Do your clothes get lost or damaged in the laundry?” and “Do you feel safe and secure?”	86.84 (3.58)	DHS
Food	Items: “Do you like the food here?” “Do you enjoy mealtimes here?” and “Can you get your favorite foods here?”	85.04 (4.91)	DHS
Physical adaptations	Items: “Is it easy for you to get around in your room by yourself?” “Are your belongings arranged so you can get them?” “Can you get the things you want to use in your bathroom?” and Do you take care of your own things as much as you want?”	88.32 (2.96)	DHS
Sores ²	Percent of high-risk long-stay residents who have pressure sores	7.85% (4.28%)	OSCAR
	The items are: “Do the people who work here ever stop by just to talk?” “Do you consider anybody who works here to be your friend?” and “Can you get help when you need it?”	82.10 (4.18)	DHS
	The items are: “Is there somebody to talk to here if you have a problem?” “Do the people who work here spend enough time with you when giving you care?” “Do you	81.96 (3.25)	DHS

	understand the people who work here when they talk to you?” “Do the people who work here listen to what you say?” “Do the people who work here explain your care to you?” “Do you consider any of the other people who live here a friend?” “Do the people who work here knock on your door and wait to be invited in?” “Are you alone too much?” “Do the people who work here ever get angry at you?” “Would you recommend this nursing home to someone who needs care?” and “Overall, what grade would you give this nursing home, where A is best it could be and F is worst it could be?”		
	Total number of hours of full-time equivalent registered nurses (RNs) and licensed practical nurses (LPNs) per day	106.33 (69.49)	OSCAR
	Total number of hours of full-time equivalent certified nursing assistants per day	193.57 (119.65)	OSCAR
<i>ables</i>			
tion	Dummy variable coded as 1 if the facility reports affiliation with a hospital	0.16	OSCAR
Medicare residents	Proportion of residents in the nursing home whose stay is paid for by Medicare.	0.09 (0.06)	OSCAR
schmann Index	$HHI_i = (100 \times \frac{NH_i \# residents}{county \# NH residents})^2$	2535.71 (1986.63)	OSCAR & ZIP code
k	Intensity of care and services provided to residents in each nursing home. Sample range 0.60-1.40.	1.01 (0.09)	DHS
population above 65 in the ZIP code		0.17 (0.06)	2000 Census
me in the ZIP code area		19984.96 (4791.30)	2000 Census

II. Variables for Organization Structure Estimations – 82 Nursing Homes

<i>Type</i>			
	1- nonprofit 0-otherwise	0.66	OSCAR
	1- government 0- otherwise	0.18	OSCAR
	1- for-profit 0- otherwise	0.16	OSCAR
<i>structure</i>			
decision-making	RNs, LPNs and CNAs’ participation in decision-making in (5-point scale from 1-not at all to 5-extreme): (1) Hiring of executive director or similar position; (2) Hiring of RNs, LPNs, and CNAs;	1.99 (0.47)	MNHES

	(3) Expansion of facilities; (4) Change in the services offered; (5) Menu planning; (6) Choosing activities for residents; (7) Determination of standards for care of residents.		
by current employees	1 if referral by current employees was the main way through which the most recently hired nursing employee was first identified; 0 otherwise	0.30 (0.45)	MNHES
	Number of fringe benefits (pension plan, health insurance, paid vacation leave and paid sick leave) received by most nursing employees (1-4).	3.64 (0.61)	MNHES
by nursing staff	The extent to which nursing employees have their work monitored and supervised by supervisors and managers? (1-not at all to 5-extreme)	3.81 (0.74)	MNHES
by merit for pay raise	1 if merit ranks as one of the top two criteria for determining individual nurse's pay raise; 0 otherwise	0.26 (0.43)	MNHES
by variables			
	Total number of residents currently reside in the nursing home	79 (41)	MNHES & OSCAR
by intensity	Intensity of care and services provided to residents in each nursing home. Sample range 0.65-1.22.	0.99 (0.09)	DHS
by affiliation	Dummy variable, 1 if the facility reports affiliation with a hospital	0.16	OSCAR
by Herfindahl-Schmann Index	$HHI_i = (100 \times \frac{NH_i \# residents}{county \# NH residents})^2$	2561.74 (1802.69)	OSCAR & ZIP code
	Nursing home's age	56.79 (35.61)	MNHES
by population density	Population density (per squared mile) in the county area where the nursing home is located	347 (729)	2000 Census
	Average hourly wage for RNs in the nursing home	21.96 (3.25)	MNHES
	Average hourly wage for LPNs in the nursing home	16.04 (2.04)	MNHES
	Average hourly wage for CNAs in the nursing home	11.07 (1.35)	MNHES
by ability to tell how well nurses carry out tasks	Extent to which supervisors are able to tell how well a nursing employee carries out his or her tasks.(1- not at all, 5 – extreme)./	3.93 (0.68)	MNHES

Minnesota Nursing Homes Employer Survey; available at <http://webpages.csom.umn.edu/hrir/abenner/web/papers/work-surv/Nursing-homes-survey.pdf>
 Online Survey, Certification and Reporting data of nursing facilities (Centers for Medicare and Medicaid Services). <http://www.cms.hhs.gov/NursingHomeQualityInits/>
 Minnesota State Department of Human Services; details available at <http://www.health.state.mn.us/nhreportcard/>
 Data for back pressure sores are based on 221 nursing homes.

Table 2. Organization Type and Structure: ^{1,2} 3SLS Estimations

Independent Variables	Delegation of Decision-Making	Selection	Fringe Benefits	Monitoring	Merit-Based Pay
Nonprofit	0.547*** (0.139)	0.536*** (0.176)	0.907*** (0.248)	1.573** (0.662)	-0.123 (0.397)
Government	0.497*** (0.186)	0.385* (0.210)	1.060*** (0.282)	1.386** (0.649)	-0.258 (0.428)
Delegation of decision-making		-0.401 (0.278)	-0.794* (0.409)	-0.986 (0.810)	-0.004 (0.357)
Selection				-1.776 (1.421)	-0.618 (0.646)
Fringe benefits				-0.271 (0.771)	0.209 (0.454)
Monitoring			-0.227 (0.210)		0.101 (0.205)
Control variables ³	Yes	Yes	Yes	Yes	Yes
N	82	82	82	82	82
Chi2	23.64	12.57	37.51	21.59	11.56
Prob>F	0.00	0.18	0.00	0.03	0.40

Notes:

1. Among the 82 nursing homes included in the analysis, 13 are for-profit, 54 nonprofit and 15 government.
2. *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.
3. For all estimations we control for firm size (number of residents), chain status, case mix (of residents' health condition), status of hospital affiliation of the home, and degree of market competition. For instrumental variables we use home age for delegation of decision-making, population density of the county area for employee selection, nurses' wages for fringe benefits, and supervisors' ability to tell how well workers carry out their work for monitoring.

Table 3a. Organization Type and Performance:^{1,2,3} 2SLS Estimations

	<i>Observable</i> ←-----→ <i>Unobservable</i>			
Independent Variables	Number of Residents	Deficiency Citations	Satisfaction	Relationship
Nonprofit	-0.066*** (0.023)	-0.223* (0.126)	0.016** (0.007)	0.024*** (0.009)
Government	-0.110*** (0.030)	-0.093 (0.161)	0.011 (0.008)	0.028** (0.011)
Inputs of RNs, LPNs and CNAs	Yes	Yes	Yes	Yes
Control variables ⁴	Yes	Yes	Yes	Yes
N	313	313	313	313
Chi2	4530.62	27.97	54.66	47.40
Prob>F	0.00	0.62	0.00	0.02

Notes:

1. Among the 313 nursing homes included in the analysis, 66 are for-profit, 202 nonprofit and 45 government.
2. All variables except for organization type, chain status and status of hospital affiliation dummies are in natural logarithm form. Estimations based on levels yield similar results.
3. *, ** and *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.
4. We control for chain status, status of hospital affiliation, proportion of Medicare residents, and degree of market competition for all the estimations, case mix for the estimations of total number of residents and deficiency citation, proportion of population above 65 in the ZIP code area for the estimation of total number of residents, and per capita income in the ZIP code area for the estimations of deficiency citations, satisfaction, and relationship variables.

Table 3b: Organization Type and Performance:^{1,2} 2SLS Estimations

	<i>Observable</i> ←-----→ <i>Unobservable</i>			
Independent Variables	Number of Residents	Deficiency Citations	Back Pressure Sores	Relationship
Nonprofit	-0.062** (0.026)	-0.308* (0.158)	-0.220* (0.132)	0.029** (0.011)
Government	-0.082** (0.036)	-0.111 (0.218)	0.033 (0.182)	0.031* (0.016)
Input of RNs, LPNs and CNAs	Yes	Yes	Yes	Yes
Control variables ³	Yes	Yes	Yes	Yes
N	221	221	221	221
Chi2	2657.08	41.25	23.86	35.38
Prob>F	0.00	0.08	0.78	0.19

Notes:

1. All variables except for organization type, chain status and status of hospital affiliation 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 chain status, status of hospital affiliation, proportion of Medicare residents, and degree of market competition for all the estimations, case mix for the estimations of total number of residents, deficiency citation and back pressure sores, proportion of population above 65 in the ZIP code area for the estimation of total number of residents, and per capita income in the ZIP code area for the estimations of deficiency citations and relationship.

Appendix 1a. Organization Type and Performance:^{1,2} 2SLS Estimations

	<i>Observable</i> ←-----→ <i>Unobservable</i>					
Independent Variables	Number of Residents	Security	Food Enjoyment	Environmental Adaptation	Satisfaction	Relationship
Nonprofit	-0.066*** (0.023)	0.006 (0.007)	0.005 (0.010)	0.012** (0.006)	0.016** (0.007)	0.024*** (0.009)
Government	-0.111*** (0.030)	0.006 (0.009)	0.011 (0.013)	0.015** (0.007)	0.011 (0.008)	0.028** (0.011)
Input of RNs, LPNs and CNAs	Yes	Yes	Yes	Yes	Yes	Yes
Control variables ³	Yes	Yes	Yes	Yes	Yes	Yes
N	313	313	313	313	313	313
Chi2	4533.51	33.99	50.38	26.52	54.66	47.40
Prob>F	0.00	0.28	0.01	0.65	0.00	0.02

Notes:

See notes to Table 3a.

Appendix 1b. Organization Type and Performance: ^{1,2} 2SLS Estimations

	<i>Observable</i> ←-----→ <i>Unobservable</i>					
Independent variables	Number of Residents	Security	Food Enjoyment	Environmental Adaptation	Back Pressure Sores	Relationship
Nonprofit	-0.062** (0.026)	0.012 (0.009)	0.005 (0.012)	0.024*** (0.007)	-0.216 (0.132)	0.029** (0.011)
Government	-0.082** (0.036)	0.011 (0.012)	0.003 (0.017)	0.030*** (0.010)	0.036 (0.182)	0.031* (0.016)
Employment of RNs, LPNs and CNAs	Yes	Yes	Yes	Yes	Yes	Yes
Control variables ³	Yes	Yes	Yes	Yes	Yes	Yes
	221	221	221	221	221	221
Chi2	2657.39	30.45	45.96	37.49	24.01	35.38
Prob>F	0.00	0.39	0.02	0.13	0.77	0.19

Notes:

See notes to Table 3a.