2006

Organizational Ownership and Service Quality: An Empirical Study on the Effect of for-Profit, Nonprofit, and Government Organizations on Nursing Home Quality

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ORGANIZATIONAL OWNERSHIP AND SERVICE QUALITY: AN EMPIRICAL STUDY ON THE EFFECT OF FOR-PROFIT, NONPROFIT, AND GOVERNMENT ORGANIZATIONS ON NURSING HOME QUALITY

By

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A Dissertation submitted to the
Askew School of Public Administration and Policy
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Degree Awarded:
Summer Semester, 2006

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To My Lovely Family

ACKNOWLEDGEMENTS

My major research interest concerns how public administration can meet the diverse needs of citizens. Such an interest has made me write this dissertation. I realize that a dissertation is not completed solely by its author. Many people helped to complete this dissertation. First of all, I would like to express my deep gratitude to Professor Frances S. Berry, my major Professor. She read all chapters of the dissertation and made valuable comments for me. That she was my major professor was the biggest gift of my academic life. Her assistance, encouragement, and never-ending care enabled me to study with confidence and belief in the doctoral program. She was always available and willing to exchange her ideas with me. In particular, Professor Berry was a good advisor who shared my research interests in the field of public management, organizational theory, and public policy. I will never forget her sweet consideration and encouragement when I leave Florida State University.

I also would like to express my appreciation to my committee members. Professor William G. Weissert, the outside member, helped me build a theoretical model of the dissertation and informed me of useful knowledge and information about nursing homes. Professor Mary E. Guy recognized the importance of health care as an independent field and helped in revising incorrect terminologies. Lastly, Professor Samuel M. McCreary helped correct some chapters from a logical perspective. I appreciate their guidance and help in spite of their demanding schedules.

I also extend my appreciation to Professor Richard C. Feiock and Professor Ralph S. Brower who guided me in the doctoral program, although they were not my committee members. Also, Dr. Jun Koo, who is my good friend, sincerely answered my questions related to methodology. Kathleen Woods carefully proofread my dissertation. I appreciate her help.

I also thank Professor Wan-Ki Paik who was my major professor in the graduate program at Korea University. He initially encouraged me to pursue my studies in the United States and gave me intellectual commitment and valuable advice throughout my study in the U.S. I confess that I was considerably influenced by his philosophy and academic thoughts. He always told me that I should exhaust all energy in my study, and that doctoral students should agonize over their study and research. Although I tried to keep in mind his advice while I studied in the United States, I hesitate to say that I fully followed his sincere suggestions due to the limitations of my abilities. I also thank several professors in the Department of Public Administration at Korea University. They provided me with theoretical knowledge and foundations about public administration.

Finally, I would like to express my deepest appreciation to my mother, Yehum Sim. Without her financial support and sacrifice, it would have been impossible to finish my study. She always emphasized that I should keep in mind the three virtues of study, health, and humility. In addition, she stressed the significance of English proficiency for successfully completing in my studies abroad. My lovely family was also comforting during my long study in the U.S. I also acknowledge my late father's contribution to my studies, especially the importance of harmony and persistence. Words are not enough to express the love that I feel for my family's support for my education.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

A nursing home includes a mixture of for-profit, nonprofit, and government-owned organizations as service providers. These organizations compete with each other to provide a better service quality. Thus, the nursing home service provides a good domain in which to compare the relative quality of services provided by these three different organizational ownerships. The existing empirical literature on the effect of ownership type on nursing home quality has suffered from lack of a theoretical framework and a systematic comparison of their relationship. This study addresses these gaps in the literature by providing a structure, process, and environment (SPE) framework and by comparing the relative influences of different organizational ownerships on nursing home quality.

The data for this study was obtained from the Online Survey Certification Reporting (OSCAR) system database, the Minimum Data Set (MDS) repository, and the Centers for Medicare & Medicaid Services (CMS). Thirteen thousand six hundred eleven nursing homes were finally used for analysis after the data was cleaned. Based on theoretical knowledge of organizational ownership and literature reviews on the relationships between ownership type and nursing home quality, I developed 16 hypotheses and tested them with multiple regression models and linear structural equation models.

The key findings of this study are that the SPE framework provides a useful tool for explaining nursing home quality, and nonprofit nursing homes have a higher quality than for-profit nursing homes in a regression analysis measured by a dummy variable. In particular, nonprofit nursing homes have a stronger influence on environmental factors than for-profit nursing homes. But, the nonprofit nursing homes do not have superiority

to the for-profit nursing homes in process factors measured by nursing care deficiencies and physical restraints. Considering that these process factors lead to improve service quality through adequate nursing care, effective strategies of nonprofit nursing homes for improving the process factors are required. This study also examines the influence of nonprofit nursing homes on for-profit and overall nursing home quality by investigating an increase in nonprofit market share. As a result, the study finds that the increase in the nonprofit market share has a positive effect on both for-profit and overall nursing home quality. This result implies that a competitive spillover effect from the nonprofits leads to higher quality by encouraging the service improvement of for-profit nursing homes.

As another significant finding, this study concludes that there are positive and negative effects of intersectoral competition among different organizational ownerships. While such competition has a beneficial effect on service quality by facilitating a profit motive in for-profit nursing homes, excessive competition may weaken nonprofits' ability to serve a socially-beneficial role in nursing home services. As a result, market competition does not always have a positive effect on service quality. Its effect is varied by different organizational ownerships and different service types provided.

This study has some limitations. First, the study measures nursing home quality with three quality measures: pressure sores, bladder or bowel incontinence, and urinary tract infections. But, it does not seem that they provide a comprehensive set of quality measures. Considering that the effect of organizational ownership on service quality produces different results with different quality measures, the selection of such comprehensive quality measures by some clear criteria would be necessary to understand fully the relationship between organizational ownership and nursing home quality. Second, this study examines the relationship between organizational ownership and quality with a nursing home service. While major findings of the study have important implications, it does not seem appropriate to apply these findings to all health care services. The nursing home industry may be less relevant for understanding broader trends in the health-care sector. Thus, future research needs to explore how the effect of organizational ownership is varied by different service areas such as economic services, social services, and health care services.

CHAPTER 1
INTRODUCTION

1.1 Different Organizational Ownerships in Service Delivery

One of the important roles of government is to meet the diverse needs of citizens through service delivery. Governments at all levels have played a pivotal role as a core service provider. They produce services themselves and choose how to deliver the services to citizens (Brown and Potoski 2003). Inherent limitations of government, such as legal constraints and absence of competition, however, make it difficult for government to dominate the delivery of services. For these reasons, government needs to seek other service providers who can participate in service delivery. Private organizations have participated in service delivery through instruments such as contracting out and cooperation or partnership with public organizations. In some service areas, however, private organizations have delivered services in competition with public organizations without these instruments. Among many service types, a nursing home includes a mixture of for-profit, nonprofit, and government-owned organizations as service providers. These organizations compete with each other to provide a better service quality. Thus, the nursing home provides a good domain that can compare the relative quality of services provided by these three different organizational ownerships.

When services are delivered by the private sector, a sector selection emerges as an important issue because the services provided primarily rely on the capacity of the service provider. In other words, the sector selection is associated with answering the question: what is an effective organizational ownership between for-profit and nonprofit organizations in the delivery of the services? When a service type provided is economic in nature or requires an investment orientation, for-profit organizations are more effective

than either public or nonprofit organizations. In contrast, nonprofit organizations excel at services when the service type generates little or no profit margin or requires extensive trust on the part of clients or volunteer labor (Osborne and Gaebler 1992). In particular, the impact of the nonprofit organizations seems more conspicuous in service areas, such as health care and social services that tend to emphasize the care of residents or consumers rather than maximization of profits. The nonprofit organizations may be more willing to assist the needy and to serve diverse populations than the for-profit organizations (Salamon 1993). Despite the significance of a sector selection in service delivery, there is little empirical evidence on the performance of different organizational ownerships on service delivery. Thus, one needs to test empirically the effect of organizational ownership in service delivery (Gormley, Jr 1994).

1.2 Definition, A Short History, and Characteristics of Nursing Homes

What is a nursing home? It does not seem that there is a broad consensus about a precise definition of the nursing home because the terminology has evolved over time. Nevertheless, the most preferred definition is the one used by the National Center for Health Statistics (NCHS). NCHS defines the nursing home as "a facility with three or more beds that is either licensed as a nursing home by its state, certified as a nursing facility under Medicare or Medicaid, identified as a nursing unit in a retirement center, or determined to provide nursing or medical care" (Delfosse 1995, 8).

Historically, the origin of nursing homes can be traced back to the American poorhouses of colonial times (Singh 2005). Although the poorhouse was not a typical nursing home, it provided the function of care for the elderly, the homeless, the ill, and the disabled as an institution for the destitute of society. The Social Security Act passed on August 1935 provided transition from county poorhouse to private old-age homes. The act provided the states with matching grants for Old Age Assistance (OAA). But, government purposely did not intend to use the grants due to the ill reputation of poorhouses. Consequently, private for-profit institutions for nursing care were developed. The Hospital Survey and Construction Act passed in 1946 made it possible to build new hospitals across the country. Government financing under this law was made available to build nursing homes under both for-profit and nonprofit types of ownership. During the

1960s, 1970s, and 1980s, the nursing home industry grew remarkably in terms of residents, facilities, and expenditures. Recently, the function of nursing homes has expanded from physical and mental care to recreation and activity programs. Thus, many nursing homes have developed several programs for transforming both structure and environment to meet the diverse needs of residents.

A nursing home has some characteristics that distinguish it from other services. First, unlike other services, beneficiaries of the nursing home service often do not have an ability to make an independent selection. Due to mental or physical impairments, residents do not perceive themselves as actively involved in the decision for using nursing home care (Castle 2005; McAuley and Travis 1997; Reinardy 1992). Thus, residents' family or friends play an important role in selecting a nursing home. Second, nursing home services often require long-term care. Thus, it is difficult to expect a visible care effect in a short-term period. This characteristic requires that nursing homes possess qualified nursing staff for continuous resident care and maintain a positive interaction between the nursing staff and residents.

1.3 Research Questions and The Significance of This Study

Service or care quality has come to the forefront in nursing home studies for the past 35 years. One of the significant issues in the studies concerns organizational ownership. It is related to a question: What is the most effective organizational ownership for providing a higher service quality? Previous studies that examined the effect of organizational ownership on nursing home quality have not yielded a consistent finding. Overall, these studies have drawn three different conclusions regarding the relationships between organizational ownership and service quality (Grabowski and Hirth 2003). First, proponents of nonprofit nursing homes argue that nonprofit nursing homes have no obstacle for providing high service quality since they are relatively free of the contaminating motive of profit. Second, there are no significant differences in the service quality between for-profit and nonprofit nursing homes. Finally, empirical evidence is inconclusive in regards to whether nonprofits provide a higher quality of care than for-profits. Recent works in the literature have continued to find mixed evidence.

Although these large empirical studies demonstrate the effect of organizational ownership on service quality, they do not provide a systematic comparison of relative influences on service quality among different organizational ownerships. In addition, despite the significance of the relationship between organizational ownership and service quality, there has been little attention to this topic in the field of public administration or organizational behavior. This study fills these gaps in the literature by examining the effect of different organizational ownerships on nursing home quality and comparing their relative influences on the quality of care. In particular, I focus mainly on the comparison of for-profit and nonprofit nursing homes. Further, this study explores the effect of special organizational ownerships, such as chain-affiliated nursing homes and church-related nursing homes, to improve the service quality.

Despite many studies on the relationship between organizational ownership and nursing home quality, there are comparatively few theoretical frameworks for explaining the quality of nursing homes (Sainfort, Ramsay, and Monato, Jr. 1995; Unruh and Wan 2004; Wan, Zhang, and Unruh 2006). Generally, Donabedian's structure-process-outcome (SPO) framework has been widely used to explain physician or hospital quality (Donabedian 1966, 1980). It provides a comprehensive framework for evaluating the quality of medical care. This SPO framework, however, is somewhat limited when applying it to nursing home quality. It fails to include: 1) important variables of structural factors; 2) a clear differentiation of outcome and quality to evaluate service quality; and 3) the influence of environmental factors such as the relevant market competition, elderly population, and median income. For these reasons, one needs to build a new theoretical framework for explaining nursing home quality.

Another important issue in the relationship between organizational ownership and service quality is market competition. A growing body of research has examined how market competition among different organizational ownerships, such as for-profits, nonprofits, and governments, within a specific service influences the service quality. But, the issue of market competition among different organizational ownerships has received little attention in the empirical literature (Hillmer et al. 2005). Although the differences in goal orientation and behavior between for-profit and nonprofit nursing homes are a main issue in nursing home studies, government as a major purchaser of

nursing home services still has an important responsibility to insure safe and acceptable quality to residents. Thus, this study explores how the market competition among these three different organizational ownerships influences service quality.

Based on the sample of 13,611 nursing homes across fifty states in the United States, this study explores five major research questions: 1) what is an adequate theoretical framework for explaining nursing home quality? 2) What is the most effective organizational ownership for providing a higher quality in nursing home service? 3) Does an increase in nonprofit market share improve the service quality of overall and for-profit nursing homes? 4) How does market competition among for-profits, nonprofits, and governments influence nursing home quality? and 5) Finally, does chain-affiliated ownership as a special organizational ownership have a positive effect on nursing home quality?

This study makes contributions to research areas in organizational behavior and health care services. First, the study contributes to a better understanding of the goal orientation and behavior differences between for-profit and nonprofit organizations. In particular, it helps recognize the significance of service delivery by showing a positive impact of the nonprofit organizations in improving the quality of care for nursing home residents. Second, while past studies on service delivery in public administration primarily focused on economic-related services, they paid little attention to health care services.[1] Among many health care services, in particular, nursing home service has experienced a considerable growth in the past two decades. A continuous increase of an aging population, increased prevalence of chronic diseases, and the shrinking nuclear family are major reasons for increasing the depth of attention on nursing home service. This study identifies the importance of health care service in the study of public administration with a nursing home case. Furthermore, the study explores how government organizations reestablish their role and function through the interaction between for-profit and nonprofit organizations. Lastly, past studies on nursing home quality did not provide a well-developed theoretical framework. Thus, predictors

[1]) I searched articles including the title of 'health care or health care service' through ABI/INFORM Global and J-STOR. I found only 14 articles with this title in *Public Administration Review* for the period 1988 to 2005 and only 11 articles with this title in *Journal of Public Administration Research and Theory* for the period 1991 to 2005.

influencing the service quality were arbitrarily addressed by researchers' preference and concern without any theoretical framework. This study contributes to the development of a theoretical framework in the study of nursing home quality by presenting a structure, process, and environment (SPE) framework.

1.4 Contents of This Study

The remainder of this study consists of five chapters. Chapter 2 explains that organizations are classified as for-profit, nonprofit, and public organizations by their ownership, and the chapter describes characteristics of each organization. In particular, I focus on managerial and environmental characteristics of each organization. Next, I discuss competing perspectives viewing different ownership types in health care service. Lastly, I discuss non-distribution constraints and information asymmetry as two major dimensions defining organizational ownership. These two dimensions help us understand the effect of organizational ownership in service delivery. Chapter 3 reviews previous literature on the effect of organizational ownership on nursing home quality and addresses recent research tendencies. Next, I outline previous theoretical frameworks for guiding nursing home quality, and present a structure, process, and environment (SPE) framework as a theoretical framework for this study.

Chapter 4 describes the method of data collection, sample selection, and unit of analysis, and the chapter also addresses variables, measurements, and hypotheses. Chapter 5 provides an analytical model for determinants of nursing home quality in for-profit and nonprofit nursing homes and analyzes and interprets their estimation results. In particular, I focus on the effect of organizational ownership on nursing home quality. In addition, I also analyze the effects of chain-affiliated nursing homes vs. non-chain affiliated nursing homes and church-related nursing homes vs. non-church related nursing homes. Next, I compare relative influences of for-profit, nonprofit, and government-owned organizations on nursing home quality. In order to test their influences, I estimate separate multiple regression models for each of the different organizational ownerships of for-profits, nonprofits, and governments. In the next part, I present and analyze a linear structural equation model for nursing home quality to examine causal relationships among variables. I also compare and analyze the structural equation models by three

different organizational ownerships on nursing home quality. The last Chapter 6 reviews major findings of this study and demonstrates their implications. Finally, the chapter concludes with a discussion of the limitations of the study and suggestions for future study.

CHAPTER 2
CHARACTERISTICS AND DIMENSIONS OF ORGATIONAL OWNERSHIP

2.1 Organizational Classification and Characteristics by Ownership

One of the major elements classifying organizations is ownership. Organizations can be publicly or privately owned. While the publicly owned organizations receive most of their funding from government, the privately owned organizations receive most of it from private and government sources including Medicaid & Medicare. This classification provides a clear way of identifying differences between public and private organizations (Rainey 2003). All organizations, however, are not distinctively categorized by this ownership. While some publicly owned organizations rely on more private funding than public funding, some privately owned organizations depend on more public funding than private funding. In particular, many privately owned organizations run by the public funding are benefited by tax exemption. More formally, these organizations are eligible for exemption from federal income taxation under Section 501 (c) (3) of the tax code. To be eligible for this Section (c) (3) status, organizations must operate "exclusively for religious, charitable, scientific, or educational purpose" (Salamon 2002). Organizations that meet these conditions are called nonprofit organizations.

Recently, nonprofit organizations have rapidly grown as an independent sector. While nonprofit organizations share some common characteristics with public and private organizations, they also have their own distinct characteristics that are different from both public and private organizations. Indeed, nonprofit organizations are so diverse and specified that it is sometimes difficult to consider them as a distinctive sector (Salamon

1999). Nevertheless, while recognizing difficulties that distinguish three different organizational ownerships, such a distinction helps identify their own role and function. Below, I describe managerial and environmental characteristics of these three organizational ownerships. In particular, I focus on economic environments in the demonstration of their environmental characteristics.

2.1.1 Managerial Characteristics of For-Profit Organizations

For-profit organizations pursue strong incentives to maximize their profits. In other words, they try to obtain more benefits with less cost. This profit maximization may lead the for-profit organizations to concentrate on the efficient production of goods or services. A competitive market mechanism makes it possible to produce them efficiently, and such a market mechanism is considered a viable strategy for increasing organizational effectiveness. Much of the theoretical basis for the market mechanism is derived from public choice theory. Its basic assumption is that individuals can express their personal preferences more efficiently through the competitive market mechanism (Hodge 2000). Unlike public organizations, such competition among profit organizations leads to greater consumer satisfaction, innovation, effective service, and cost savings.

Leaders of for-profit organizations are concerned with managerial strategies to motivate their employees to increase organizational effectiveness. Cacioppe and Mock (1984) find that employees in the private sector are motivated by monetary rewards, while public employees are motivated by a willingness to provide public services to citizens. A fair reward system based on performance may be an effective managerial strategy for increasing employee work motivation. Recently, a new leadership style emphasizing energetic and mission-driven leadership has emerged as central to motivate organizational employees in the private sector. Leaders possessing this leadership are often portrayed as innovators providing creative ideas and pursing revolutionary changes. Successful leaders need to possess creative spirit and entrepreneurship to motivate their employees.

2.1.2 Managerial Characteristics of Nonprofit Organizations

Nonprofit organizations have organizational goals other than profit maximization. Generally, the nonprofit organizations emphasize a voluntary spirit that would flow from participation, membership, and support. This voluntary spirit makes it possible to have

the ability to self-govern with autonomy (Anheier and Ben-Ner 2003). This self-governing is one of the important managerial characteristics defining nonprofit organizations. Frumkin (2002) also indicates that this non-coercive voluntarism is the most fundamental feature of nonprofit organizations. This feature facilitates a managerial strategy based on independence and autonomy rather than control and regulation.

Nonprofit employees tend to be mission-oriented. They are more likely to be motivated by voluntarism or altruism (Rose-Ackerman 1996; Salamon 1999; Wolfe 1998). Sen (1977) argues that nonprofit employees are motivated by commitment rather than sympathy for the other. This voluntary commitment enables the nonprofit employees to work without control or supervision. As behavioral attributes, such as voluntarism, altruism, and charity, enable nonprofit employees to respond to clients' needs with great personal sacrifice.

As a substantial function of the voluntary and mission-oriented spirit, nonprofit organizations have played a central role as a practical vehicle for the delivery of a variety of services. Nonprofit organizations respond to unmet demands of consumers by providing services that are difficult for the market or government to deliver. When nonprofit organizations deliver the services, they often tend to adopt managerial strategies and techniques of for-profit organizations for effective service delivery. As a result, wide participation in this service delivery makes it difficult for nonprofit organizations to retain their own mission and voluntary spirit (Bush 1992). By focusing on for-profit mechanisms, they may underappreciate the basic value of participation and membership and adopt the businesslike practices of their for-profit counterparts.

But, it does not seem that the service provision of nonprofit organizations neglects their voluntary spirit. Rather, the provision of goods and services through nonprofit organizations may be another way to promote such voluntary spirit. When nonprofit organizations, in particular, provide collective-type services that have the attributes of public goods, the provision of these services is matched with principles of voluntary citizen-driven service and advocacy. Further, it is seen as an important role in contributing to a democratic society.

2.1.3 Managerial Characteristics of Public Organizations

Generally, management refers to the set of conscious efforts to mobilize actors and resources to carry out established collective purposes (O'Toole Jr. and Meier 1999, 510). The managerial function is influenced by the structural arrangement of an organization. Public organizations are usually operated in a hierarchical structure. It refers to a stable set of patterns in which positions are arrayed in terms of formal superior-subordinate authority relations. Within this hierarchical structure, public organizations have less decision-making autonomy and flexibility, more constraints on procedures and spheres of operations, and a greater tendency toward proliferation of formal specifications and controls than private organizations (Bozeman and Bretschneider 1994; Rainey 1983; Rainey, Pandey, and Bozeman 1995).

Recently, a new structural form in which public programs are spread across two or more organizations has emerged. Research on networks in public management focuses on how network structure effectively delivers intergovernmental programs or services (Agranoff 1986; Berry et al. 2004; Gage and Mandell 1990). What is the reason for the increase in network research in public management or administration literature? Although there are several reasons, the most important thing is that many public administration researchers or scholars believe that networks have a positive influence in effectively delivering public services. Provan and Milward (1995) find that centralized network structures produce a better outcome for systems of community mental health delivery than diffused network structures. Later, they (2001) show that the centralized network structures work effectively in public service delivery when network organizations enhance their capacity and satisfy the needs and interests of people who work for the organizations.

Considering that an important function of management is to motivate employees for collective purposes, it is important to recognize effective strategies to motivate them. Public employees are different from private employees in terms of certain motivational incentives. In general, it has been argued that public employees are motivated by more intrinsic rewards than private employees (Banfield 1975; Cacioppe and Mock 1984; Rainey, Backoff, and Levine 1976). In a study comparing reward systems across the public and private sectors, Wittmer (1991) finds that monetary rewards and incentives are

major motivators for private employees, while service spirit is a primary factor for public employees. Based on this finding, he concludes that motivational differences between public and private employees still exist. Houston (2000) also finds that public employees place a higher value on service provision to citizens, the public interest, and the importance of their work than private employees.

But, it seems controversial that public employees are only motivated by such a service spirit without a proper reward or incentive. Although there is no doubt that the service spirit is a necessary virtue that public employees should possess, they also need to receive internal or external rewards that are equal to their performance. In particular, it is important to acknowledge that public employees are motivated by external rewards, such as pay, promotion, and job security, as well as internal rewards.

2.1.4 Environmental Characteristics of For-Profit Organizations

For-profit organizations act under an external environment that is relatively free from political interference or influence. Thus, they enjoy benefits of less oversight and more autonomy than public organizations. Instead, the for-profit organizations compete with each other to maximize their profits. When competition is present, the for-profit organizations try to take a dominant position in the market. In particular, unlimited competition is rapidly growing as an important environmental characteristic surrounding them.

The nature of this competition is closely associated with profit incentives. If for-profit organizations do not receive any direct financial benefits from the provision of services, they may hesitate to compete with other organizations to provide the services. This tendency is likely to occur in service areas, such as health care and social services, that do not usually exist in a highly competitive market. As an example, for-profit organizations are less likely to provide day care service for disadvantaged children because the service does not bring a direct financial benefit in the short-term. Furthermore, in the current environment where public-private partnership or cooperation increases, for-profit organizations may face a challenge in finding a way to harmonize their profit pursuits and such cooperation or partnership.

2.1.5 Environmental Characteristics of Nonprofit Organizations

Nonprofit organizations have been a significant part of our society. They perform diverse functions and contribute to social development and integration. Recently, nonprofit organizations have emerged as a core service provider in many service areas. In particular, they play an important role in the delivery of collective-type services such as health care and social services (Weisbrod 1988). For-profit organizations are reluctant to deliver health care and social services because these services do not provide the for-profit organizations with a direct profit in the short-term. A major reason for preferring nonprofit organizations in the provision of these services is not to be more efficient in delivering a service that could be delivered in any case, but rather to reach clients or to fulfill roles that a for-profit organization could not serve (Bendick 1989).

In recent years, nonprofit organizations have increasingly formed partnerships and collaborations both within and across sectors in service delivery. Many nonprofits begin to consider these formalized collaborations as a proper response to changing resources and institutional environments. A few studies concern the choice of collaboration forms by nonprofit organizations. Foster and Meinhard (2002) examine determinants influencing the collaboration of nonprofit organizations. They propose that internal organizational characteristics, environmental pressures, and organizational attitudes are important in determining whether a nonprofit organization can collaborate. In particular, they find that organizational factors, such as size and type, are strong predictors influencing organizational collaboration. In other words, larger organizations are significantly more likely than smaller organizations to collaborate. Feminist organizations, those organizations that feel environmental pressure more keenly, and those organizations highly motivated to collaborate are more likely to be engaged in the activity of interorganizational collaboration. Guo and Acar (2005) also find that a nonprofit organization is more likely to increase the degree of formality of its collaborative activities when it is older, has a large budget size, and receives more government funding. These new collaborations of nonprofit organizations are seen as an effort to respond to changing environments.

2.1.6 Environmental Characteristics of Public Organizations

Rainey (2003) indicates that the absence of economic markets, legal constraints, and external political influence are major environmental factors influencing public organizations. Among these three factors, the absence of economic markets provides a clue that for-profit or nonprofit organizations can participate in the provision of public goods or services. But, there are three economic rationales to argue why public goods or services, at the same time, should be provided by public organizations.

First, some public goods or services have the characteristic of non-divisibility, which allows for free riders. In other words, once services are provided, everyone receives their benefit. Some individuals have the benefit to act as free riders without a direct contribution to the public goods or services. Thus, government imposes taxes to pay for such services or goods. National defense is the most frequently cited one as a service that should be provided by government. Even if private organizations could provide this service, it could be difficult to secure its duration because of the size and specialty of national defense.

The second rationale is externalities. Externalities mean that some consumers or producers are influenced by free charges without the intervention of the market. For example, a manufacturer that generates air pollution imposes costs to others who are not directly involved in consumption of the product. Private organizations are reluctant to produce goods or services that generate negative externalities because private organizations have less accountability in responding to negative influences generated by such externalities than public organizations. Thus, it may be reasonable that goods or services generating negative externalities are provided by public organizations.

Finally, certain goods or services have the effect of income redistribution. For example, government or public organizations provide the disadvantaged or disabled with some goods or services for their financial support or social benefit. The provision of these goods or services includes critical democratic values such as fairness and social equity. In this case, these values are not object of major concern for private organizations whose aim is to pursue profit incentives through competition. Thus, public organizations primarily provide goods or services having the characteristic of such income redistribution.

For these reasons, public organizations have provided public goods or services. But, the absence of competitive pressure within public organizations makes it difficult for them to dominate the service provision. Further, such an absence makes it difficult to meet the growing diverse needs of citizens. Thus, public organizations often attempt to collaborate with for-profit or nonprofit organizations offering similar services within a specific service area.

Based on managerial and environmental characteristics, it seems true that each for-profit, nonprofit, and public organization has its own distinctive characteristics. What are the substantial implications of identifying the characteristics of these three different organizational ownerships? A genuine reason for examining such characteristics is that they may help understand the roles and functions of these three different organizations. Recently, public-private partnerships, government-nonprofit partnerships, or regional partnership have emerged as new organizational forms for effective service delivery. In this context, understanding the interaction among these three organizational ownerships has an important meaning. I have demonstrated managerial and environmental characteristics of three different organizational ownerships. In the next part, I discuss the effect of ownership type on organizational performance in health care service as a specific service area.

2.2 Ownership Types in Health Care Service

Health care service organizations are also classified by ownership. Some organizations are owned by investors seeking a profit. Others are classified as nonprofits where they do not distribute the profit to any person. Many health care organizations are also owned by a government entity (Longest, Jr., Jonathon, and Kurt Darr 2000). Cities or counties establish public health departments or agencies. An important issue about ownership in health care service is to compare performances between for-profit and nonprofit providers. Three competing perspectives are presented with their own persuasive argument. First, those advocating for for-profit health care providers argue that the for-profits may be more cost efficient and better managed than nonprofits because of market incentives (Clark 1980; Jensen and Ruback 1983). The market incentives make it possible for the for-profit providers to respond to competition more

quickly than the nonprofit providers in improving service quality (Rice 1998). In contrast, those who argue for the superiority of nonprofit health care providers speak of their special mission to serve customers. Nonprofits promote more trustworthy professional norms from the patient's standpoint than for-profits (Majone 1984). The nonprofits benefit from volunteers and receive the financial benefits of tax exemption. Lastly, some argue that distinctions between the for-profits and the nonprofits are questionable. In other words, clear differences between both organizations are disappearing (Frank and Salkever 2000; Sloan 1998). For-profit and nonprofit health care providers face the same pressures, share the same incentives, and resemble each other. Although these competing perspectives have their own advantages, no systematic review of the relative performance of for-profit and nonprofit health care providers has been undertaken with the investigation of empirical research.

Recently, Rosenau and Linder (2003) report a systematic review that compares performance between for-profit and nonprofit health care providers with 149 studies published since 1980. They use four performance criteria: access, quality, cost/efficiency, and amount of charity care. Figure 2.1 displays relative performances by these four criteria between for-profit and nonprofit health care providers. According to their systematic review, nonprofit providers provide better services than their for-profit counterparts. In particular, 69 studies among a total of 149 studies sought to compare quality of care. Among the 69 studies, 41 studies (59 percent) found that nonprofit providers are superior, and 20 studies (29 percent) reported no difference. Only 8 studies (12 percent) found that the for-profits provided a better quality of care than the nonprofits (Rosenau and Linder 2003, 225).

What are the reasons that nonprofit providers provide a better performance with regard to quality of care than for-profit providers in health care service? Unlike other services, the response of customers or residents who are benefited from the health care service is very critical as a criterion for evaluating the performance of the service. Furthermore, health care service itself characterizes a long-term effect rather than a short-term effect. This characteristic of the health care service makes it difficult for for-profit providers interested in short-term financial gains to participate in the service delivery (Schlesinger, Marmor, and Smithey 1987). Trustworthiness and long-term care to

residents may be important indicators to evaluate organizational performance in health care service. Nonprofit organizations emphasizing professional norms based on trustworthiness and voluntary spirit seem to be better matched with characteristics of health care service than for-profit organizations.

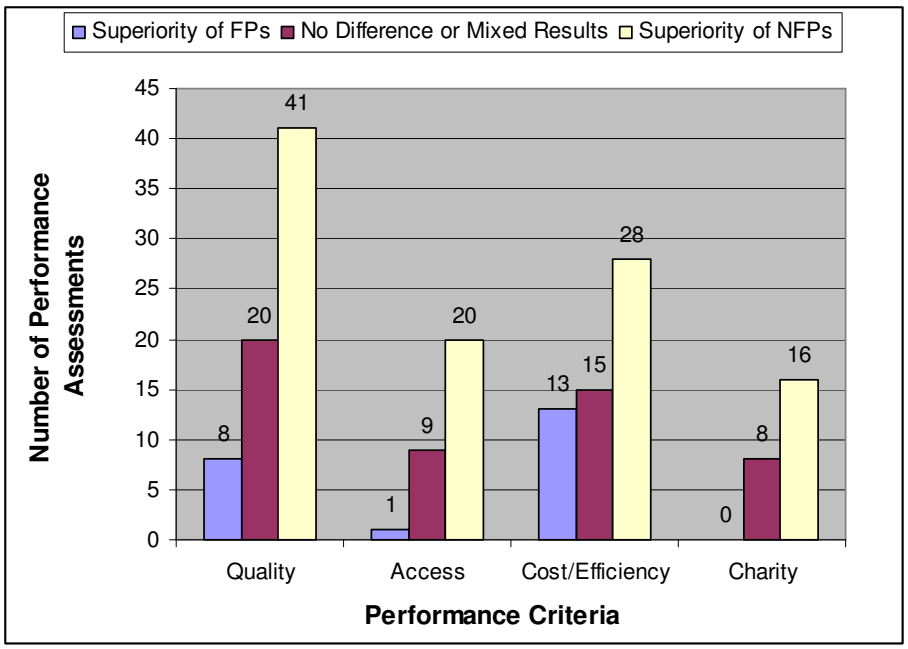

Figure 2.1 Performance of For-Profit vs. Nonprofit Providers

Source: Rosenau, Pauline V. and Stephen H. Linder (2003). "Two Decades of Reserch Comparing For-Profit and Nonprofit Health Provider Performance in the United States." *Social Science Quarterly* 84(2), P. 225.

2.3 Two Major Dimensions of Organizational Ownership

2.3.1 Non-Distribution Constraint

One dimension that defines organizational ownership, for-profits versus nonprofits, is a non-distribution constraint. It means that an organization is prohibited from distributing its net earnings to any individuals, such as members, directors, or

officers, who exercise control over the organization (Weisbrod and Schlesinger 1986). Net earnings means pure profits-- that is, earnings in excess of the amount needed to pay for services provided by the organization (Hansmann 1980). This non-distribution constraint provides a primary pretext for expecting differences in the activities and performances of for-profit and nonprofit organizations that deliver similar public services (Heinrich 2000). Most nonprofit organizations are inhibited from pursuing their own private interests at the expense of the common good. Thus, their net earnings are only used for production of services being provided. As a benefit of the non-distribution, nonprofit organizations often receive an exemption from local property and sales taxes. The non-distribution constraint of the nonprofit organizations gives consumers a certain confidence that a transaction will occur in a fair exchange without the possibility of exploitation. This confidence is associated with a belief that members of nonprofit organizations provide a better service quality with altruistic motives.

The non-distribution constraint, however, has some limitations for a perfect remedy for contract failure between producers and consumers. Steinberg and Gray (1993) indicate such limitations. First, the non-distribution of profits does not mean that those who control a nonprofit are free of economic incentives. They may still have the likelihood of fostering other personal goals that can be enhanced by such economic incentives. Second, many nonprofit organizations may cheat on their revenue-raising activities in order to cross-subsidize their charitable purpose. Third, competition with less trustworthy organizations forces nonprofits either to compromise their integrity or go out of business. As a result, these nonprofits may lose their voluntary spirit.

2.3.2 Information Asymmetry

Another dimension defining organizational ownership is information asymmetry. Consumers often do not possess accurate information and knowledge to evaluate the quality of goods or services as do producers. Producers have sufficient information to evaluate the quality of services provided, whereas consumers are frequently unable to or find it difficult to evaluate the quality of the services provided. As a result, information asymmetry occurs between the producers and the consumers when they evaluate service quality. There are three basic causes of this information asymmetry (Young 2001). First, certain goods or services are inherently complex, so that it is difficult to judge their

quality. Second, consumers themselves do not have the ability to evaluate the goods or services. Services provided to the impaired elderly or the mentally ill are good examples. Third, certain services may not be purchased by the same individual who consumes them. Thus, the purchaser does not directly evaluate the service quality.

Regarding this information asymmetry, for-profit organizations may have more likelihood to engage in opportunistic behaviors and to maximize their profits (Chou 2002). In contrast, nonprofit organizations may have a competitive advantage in evaluating service quality because the lack of a profit motive may motivate honest behavior by the nonprofits, ensuring that they deliver the promised and necessary level of service quality (Grabowski and Hirth 2003).

Contract failure theory provides the basic source of information asymmetry. As proposed by Hansmann (1980), a contract between producers and consumers for certain goods or services is based on trust between them. But, consumers often feel that they are unable to judge competently the quality of the goods or services because of lack of information and knowledge about them. Thus, consumers are reluctant to purchase the goods and services due to the fear of being cheated. This situation may lead to a contract failure between producers and consumers.

Under certain conditions of information asymmetry, Hirth (1997, 1999) offers an interesting idea about the relationship between ownership type and service quality. He argues that nonprofit organizations can serve as a credible provider of quality to poorly informed consumers by showing that they have less incentive than for-profit organizations to underprovide quality. Further, he argues that competition between nonprofit organizations helps improve service quality of for-profit organizations through a spillover effect. As empirical evidence, Grabowski and Hirth (2003) find that under circumstances of asymmetric information, an increase in the nonprofit market share leads to improvement both in for-profit and overall nursing home quality. Chou (2002) also shows that nonprofit nursing homes provide a better service quality than for-profit nursing homes when asymmetric information is present. He uses "visit frequency" as an indicator whereby asymmetric information is defined and measures it when nursing home residents have no spouse or no child visiting within a month after admission (Chou 2002, 294). Under circumstances where information asymmetry is not considered, however,

increased nonprofit market share does not lead to improvements either overall or in for-profit nursing home quality (Spector, Selden, and Cohen 1998). To be sure, there are no significant differences in service quality between for-profit and nonprofit homes when the residents have family members to monitor service quality.

Although this information asymmetry provides a theoretical foundation for the rise of nonprofit organizations, they tend to be depicted as a passive actor filling the gaps of government failure or lack of for-profit organizations in the service delivery system (Frumkin 2002). This explanation may inhibit the recognition of nonprofit organizations as independent and creative actors. Rather, when one understands the emergence of nonprofit organizations as a voluntary actor, their existence may be recognized as an active actor.

CHAPTER 3
LITERATURE REVIEW AND A THEORETICAL FRAMEWORK

3.1 Literature Review on the Effect of Organizational Ownership on Nursing Home Quality

Improving quality in providing a service primarily depends on the capacity of service providers because they possess many financial and human resources. In the study of nursing home service, a large empirical literature has focused on the comparison of relative quality between for-profit and nonprofit nursing homes. Nevertheless, previous studies that compare the effect of both organizations on nursing home quality have not yielded consistent findings. The studies may be categorized as having three different findings: positive impacts of nonprofit nursing homes, no significant quality differences between both nursing homes, and mixed findings. Next, I review literature in each category and discuss its strengths and weaknesses.

3.1.1 Positive Impacts of Nonprofit Nursing Homes

Proponents of nonprofit nursing homes argue that a voluntary spirit contributes to the improvement of quality in nursing home services to residents who require to relatively long-term care. Greene and Monahan (1981) find that for-profit nursing homes have lower levels of service quality than nonprofit nursing homes, indicating that ownership is the strongest predictor of nursing home quality. In this study, they measure the quality of care as an unweighted composite index of the following items: RN nursing hours, RN expenditures, patient care expenditures, and miscellaneous direct patient care expenditures, each standardized on a per patient day base. But, the study has some

limitations. A sample size used in the study is relatively small (24 nursing homes), and it is obtained from nursing homes in Phoenix, Arizona only. Thus, it is difficult to generalize from results of the study. Hawes and Phillips (1986) review previous literature on the impact of nursing home ownership on service quality. Based on the literature review, they conclude that nonprofit nursing homes provide a better service quality than for-profit nursing homes. In particular, the authors suggest a systematic categorization of ownership type. They indicate that categorizing government-owned nursing homes as nonprofit ownership may obscure the ability to find significant differences between different organizational ownerships in service quality. Aaronson, Zinn, and Rosko (1994) also find that nonprofit nursing homes provide a higher quality of care to Medicaid and self-pay residents in quality measured by care staff per bed, pressure sore rates, and restraint use rate than for-profit nursing homes. Harrington et al. (2001) examine relative influences of for-profits, nonprofits, and governments on nursing home quality. In order to measure the quality, the authors used total deficiency rates classified into three subgroups: quality of care, quality of life, and other deficiencies. As a result, they find that for-profit nursing homes provide lower quality care than do nonprofit or government-owned nursing homes. Most recently, Hillmer et al. (2005) conclude that based on empirical research for the past 12 years (1990-2002), nonprofit nursing homes appear to provide a higher quality of care than for-profit nursing homes.

Overall, these studies tend to measure it as a dummy variable to capture the effect of ownership type in nursing home quality. Thus, they do not fully provide a systematic comparison about relative influences of predictors between for-profit and nonprofit nursing homes. For instance, while average RN hours will be a stronger positive predictor on service quality in nonprofit nursing homes than in for-profit nursing homes, the higher proportion of Medicaid residents will be a stronger negative predictor on service quality in for-profit nursing homes than in nonprofit nursing homes.

To examine the effect of nonprofit organizations on nursing home quality, Hirth (1999) argues that an increase of nonprofit organizations in nursing home markets improves for-profit nursing home qulaity as well as overall nursing home quality. In other words, the increase in the nonprofit market share facilitates improvement in the quality of for-profit nursing homes by encouraging competition among them through a

spillover effect. The probability of receiving the promised quality rises with the greater presence of nonprofit organizations. Grabowski and Hirth (2003) offer empirical evidence supporting Hirth's argument in their research with a national data case of 16,978 nursing homes across fifty states in the United States. They find that a 10 % increase in non-profit market share is associated with 4.4 % increase in for-profit nursing home quality and 2.2 % increase in overall nursing home quality. But, this finding is only supportive under circumstances of asymmetric information that residents do not have complete information to judge nursing home quality (Chou 2002). In short, the effect of nonprofit organizations versus for-profit organizations on service quality is larger when asymmetric information exists between service providers and residents. Under circumstances of this asymmetric information, an increase in the nonprofit market share leads to improve the service quality of both for-profit and overall nursing home quality through a competitive spillover effect.[2]

3.1.2. No Significant Quality Differences

While some studies find that there are significant differences between for-profit and nonprofit nursing homes on service quality, others find their similarities rather than their differences. Holmberg and Anderson (1968) reveal more similarities than differences between for-profit and nonprofit nursing homes on service quality. Only the number of physician hours per resident in nonprofit nursing homes is greater than the for-profit nursing homes. O'Brien, Saxberg, and Smith (1983) review previous literature on the effect of organizational ownership on nursing home quality, focusing on the comparison of for-profit and nonprofit nursing homes. Based on the literature review, they conclude that for-profit or nonprofit nursing homes have relative advantages so that it is difficult to generalize some results obtained from studies comparing the effect of both nursing homes on service quality. The difficulty of this comparison partly stems from unsatisfactory and inconsistent measures of quality. Ullmann (1987) indicates

[2]) Although this argument provides a persuasive explanation on the effect of nonprofit organizations on nursing home quality, it seems that it generates the problem of an ecological fallacy by a discrepancy in the unit of analysis. While the unit of analysis of market competition is an organization (a nursing home), the unit of analysis of information asymmetry is an individual (a resident). The authors also recognize that their study does not directly observe poorly informed residents in the nonprofit nursing homes (Grabowski and Hirth 2003, 20).

problems in measuring quality. He argues that the relationship between ownership type and performance will not be clarified unless methods of quality assessment are made more objective and comprehensive. Most recently, Wan, Zhang, and Unruh (2006) find that key factors of organizational structure and process influence the overall quality of nursing home. As a result, the authors find that ownership type measured by a dummy variable (for-profit- 1) has no statistically significant difference with quality measured by an index including the incidence of pressure sores, physical restraints, and indwelling catheters.

But, failure to observe significant differences between ownership type and service quality is not evidence that organizational ownership is not a key predictor of quality. As mentioned earlier, the diversity and difficulty of measuring quality may produce empirical results that have no significant differences between for-profit and nonprofit nursing homes on service quality. However, considering the usefulness of intersectoral competition between different service providers and the social benefits of nonprofit organizations, the ownership type may still be a significant predictor for explaining relative differences in service quality between for-profit and nonprofit nursing homes.

3.1.3 Mixed Findings

Some empirical evidence is not conclusive regarding whether nonprofit nursing homes provide a higher quality than for-profit nursing homes. Cohen and Spector (1996) find that ownership type has a positive impact on service quality measured by professional nursing staff intensity including total staff per 100 residents, registered nurses (RNs), and licensed practical nurses (LPNs). Nonprofit nursing homes have lower LPN staffing intensity at the .05 level and higher RN staffing intensity at the .10 level than for-profit nursing homes. These results imply that nonprofit nursing homes have a more skilled and trained mix of staff.

In contrast, Gertler (1992) finds that nonprofit nursing homes provide a lower quality than for-profit nursing homes. He assumes that the Medicaid program improves the access of financially indigent residents. As a result, Medicaid improves the access of Medicaid residents by raising the financial outlay. But, an increase in Medicaid expenditures leads to lower quality. In a comparison of quality measured by costs between for-profit and nonprofit nursing homes, nonprofit nursing homes pay about 11 %

higher costs than those of for-profit nursing homes. While Gertler examines the effect of organizational ownership on service quality, focusing on the access of Medicaid residents, Bliesmer et al. (1998) compare for-profit and nonprofit nursing homes on service quality, focusing on nursing staff levels. They find that the greater use of licensed nurses improves service quality measured by resident's Total Dependence Score (TDS).[3] In addition, they also find that there is a significant difference between for-profit and nonprofit nursing homes in service quality. For-profit nursing homes provide a higher service quality than nonprofit nursing homes, indicating the lower total dependence score. Castle and Shea (1998) also do not find evidence that there are consistent differences in the relationship between organizational ownership and quality of care for mentally ill residents.

Overall, these research findings do not show a consistent result that nonprofit nursing homes provide a higher quality than for-profit nursing homes. Based on previous literature reviews on the relationship between ownership type and nursing home quality, as Davis (1991) indicates, it would be premature to conclude that nonprofit nursing homes provide a higher quality than for-profit nursing homes, indicating that there is no consistent ownership-quality relationship.

3.1.4 Overall Evaluation

I have reviewed previous literature that examines the effect of organizational ownership on nursing home quality. Not surprisingly, the literature has not yielded a consistent research finding. It may reflect the significance of the relationship between organizational ownership and service quality. One of the main reasons for mixed research findings seems to stem from the use of several different indicators in measuring service quality. Many researchers have suffered from difficulties in adequately capturing the quality concept. Any attempt to measure quality is always less than satisfactory because the quality concept has a value-laden character (Davis 1991). Thus, quality cannot be measured by a single, objective indicator because it involves many criteria reflecting the preferences of multiple nursing home constituencies. As long as we accept

[3]) TDS means the total score on the assessment of eight activities of daily living; the score is summed by the eight activities. They include: dressing, growing, bathing, eating, bed mobility, transferring, walking, and toileting.

that quality is a multidimensional construct reflecting the values of different constituencies, it is inevitable that disagreements about quality measurement will exist. Nevertheless, this difficulty should not deter a sound and elaborative measurement of quality. The use of multiple indicators to measure quality and the minimization of ambiguity generated by value differences may alleviate its incorrect and biased measurement.

Overall, it seems that nonprofits have advantages over the for-profits in service areas that pursue relatively less profit motives or provide consumers with asymmetrical information in the purchase of services. In addition, a voluntary motivation of the nonprofit organizations may foster experimentation and permit those who represent unpopular or extreme ideologies to put their ideas into practice (Rose-Ackerman 1996).

Some attributes of nursing home service satisfy the theory that nonprofit organizations can provide a better service than for-profit organizations. Nursing homes aim to recover the health of economically indigent or elderly residents through the service of high quality rather than through the pursuit of profits. Thus, they emphasize the responsiveness and the trust of residents in order to provide better service quality that requires the voluntary labor of nursing staff. These characteristics of nursing homes are major reasons that many people prefer nonprofit organizations for the improvement of service quality. Although nonprofit organizations are not consistently viewed as more trustworthy than for-profit organizations in delivering similar services, the former tends to have more advantages over the latter in service areas that require a voluntary labor and less profit motives. Even if nonprofit nursing homes provide a better service quality than for-profit nursing homes, they are not a panacea that can solve all problems generated in providing a high service quality.

Recently, networks have emerged as a new organizational form for an effective service delivery. It has been a main research topic in the delivery of health care service. Over the past decade, many health care researchers have investigated how health care providers can provide consumers with improved services. The provision of these services is difficult to meet with only one service provider because health care consumers have diverse needs and preferences for specific services. For this reason, health care providers may need to seek new organizational forms that can meet their diverse needs

through effective service delivery. These are called partnership, collaboration, allegiance, or coalition. Although these new organizational forms are called different terms, many researchers have a shared belief that networks have a positive effect on the improvement of service quality. I understand these terms to mean a network, a more comprehensive concept. In a very broad definition, the term "network" is defined as a set of nodes or actors interconnected by a set of ties representing some relationships (Borgatti and Foster 2003; Brass et al, 2004; Raab and Milward 2003).

In the past ten years, there has been a new interest in efforts to improve health care services through different organizational forms such as public-private partnerships, collaboration, or cooperation (Bazzoli et al. 1997; Bogue et al. 1997; Kreuter, Lezin, and Young 1999). Above all, the Community Care Network (CCN) program developed in 1995 is a national demonstration program that focuses on restructuring local health delivery systems into CCNs. The CCN initiative was designed to increase the ability of public-private partnerships to address several issues generated in community health care improvement (Shortell et al. 2002). The CCN program begins with 25 public-private partnerships selected from a diverse range of communities. They include an array of individual organizations representing health care providers, public health and human service agencies, local government, community-based organizations, and religious and educational institutions (Hasnain-Wynia 2003, 6s). The ultimate goal of the CCN program is to improve access, cost, quality, and health outcomes of health care services, focusing on four principal dimensions such as community health focus, seamless continuum of care, management within limited resources, and community. As a result, there is a positive correlation between the four dimensions toward the CCN vision and the score on each outcome dimension. In particular, their correlation is the highest in service quality ($r = .46$) and access ($r = .39$) (Conrad et al. 2003).

Despite this effort in health care services, there are few works about network studies on nursing home services. Although chains, multiple ownerships, or partnerships have emerged as new organizational ownerships in nursing home services, there are few systematic studies that examine the relationship between these organizational ownerships and service quality. Rather, the lack of such studies may encourage us to study the relationship.

3.2 Theoretical Frameworks for Nursing Home Quality

In nursing home studies, service or care quality has been a central concern. What is service quality? It is defined as "consistent delivery of services that maximize the physical, mental, social, and spiritual well-being of all patients, produce desirable outcomes, and minimize the likelihood of undesirable consequences" (Singh 2005, 616). Although the issue of the service quality has been studied over 30 years, theoretical frameworks to guide this study have only recently emerged (Unruh and Wan 2004). Generally, Donabedian's structure, process, and outcome (SPO) framework has become widely used as a popular framework for measuring quality in health services (Luft 1988; McGlynn et al. 1988; Wyszewianski 1988).

According to this SPO framework, quality of medical care can be measured by structure, process, and outcome components (Donabedian 1966). Structure refers to the relatively stable features that affect the ability to deliver services (Davis 1991, 130). It generally includes professional and organizational resources such as ownership, bed size, occupancy rate, resident mix, and staffs that are available to provide services. Process means appraisal of the service itself and examines activities and services provided. The process includes both clinical and non-clinical service activities for communications and interactions between staff and residents (Wan, Zhang, and Unruh 2006). Finally, outcome is an endpoint of services and the essential measure of quality. It is measured by several indicators such as patient satisfaction, infection rates, mortality rates, discharge, and survival rates.

Although the Donabedian's SPO framework has often been utilized in the study of medical care quality, it is not clear whether the framework is directly applied to nursing home quality. Donabedian (1969) also indicates that nursing homes pay greater attention to social and psychological aspects of patient management than any other service. In addition, nursing homes are characterized by long-term care and that residents do not play an important role in selecting a nursing home. Sainfort, Ramsay, and Monato (1995) discuss the importance of causal linkages between structure, process, and outcome factors involved in producing nursing home quality. In particular, they emphasize the organizational slack factor, indicating a thorough investigation between structural characteristics of an organization and dimensions of quality. Unruh and Wan (2004) also

indicate that the SPO framework neglects the importance of environmental factors. When quality is assessed in nursing homes, it is also important to assess not only the nursing care that is given, but also the quality of social support and the environment influencing the nursing homes.

While many studies follow the SPO framework for nursing home quality, some use a non-SPO framework. Glass (1991) addresses four dimensions of nursing home quality:1) staff interventions; 2) physical environment; 3) nutrition/food service; and 4) community relations, indicating that the SPO framework is not adequate for long-term care application. But, it is not clear that these four dimensions are categorized by some clear criteria. In addition, the conceptual model with these four dimensions does not include critical dimensions of actual care for residents. Rantz et al. (1998) propose a multidimensional model to guide nursing home quality, focusing on groups such as nursing home staff and residents. This model includes seven dimensions: central focus, interaction, milieu, environment, individualized care, staff, and safety. Although their multidimensional model provides a useful tool for understanding the relationship between focus groups and service quality, the model does not provide a theoretical framework for explaining the quality.

3.3 An Alternative Framework-- Structure, Process, and Environment (SPE) Framework

As noted, it does not seem that the SPO framework provides an appropriate one for nursing home quality. As a basic conceptual problem, the SPO framework assumes that structure, process, and outcome are indicators for measuring quality. But, it is more appropriate that these indicators are predictors influencing the quality rather than indicators for measuring quality itself. Davis (1991) clearly indicates this conceptual confusion of variables used as both predictors of and criteria for quality. For instance, nursing staff hours are used as an indicator to measure service quality in some studies, while they are employed as a predictor influencing the quality in others. In particular, outcome as one indicator for measuring nursing home quality may raise a more serious conceptual confusion with quality itself. I do not find any significant conceptual differences between outcome and quality. Rather, it seems that indicators, such as patient

satisfaction, pressure sores, incontinence, mortality, and infection rate, to measure the outcome are also indicators to measure quality itself. Instead, environment is an important predictor influencing nursing home quality (Unruh and Wan 2004). Considering that nursing home quality can be improved with social and environmental support surrounding nursing homes, there is no question that environmental factors play an important role in improving nursing home quality. They include regional location of nursing homes, relevant market competition, median income, and population over the age of 65 in each county in which nursing homes are located.

Furthermore, Donabedian's SPO framework does not account for the dynamic nature between service providers as a critical variable of structural factors. In other words, it does not fully explain differences among different organizational ownerships. To overcome these problems, I suggest a structure, process, and environment (SPE) framework as a theoretical framework for explaining nursing home quality. In particular, I focus on the structural factors, such as nurse staffing levels, ownership type, bed size, and resident characteristics. Next, I address important components of the SPE framework.

3.3.1 Structural Factors

First of all, nurse staffing levels play an important role in improving service quality. Nursing staffs usually include registered nurses (RNs), licensed practical nurses (LPNs), and nursing assistants (NAs).[4] The relationship between these nursing staffs and the service quality has been widely studied. Several empirical studies find that licensed nursing staffs, such as RNs and LPNs, have a positive effect on nursing home quality (Bliesmer et al. 1998; Cohen and Spector 1996; Harrington et al. 2000; Kanda and Mezey 1991; Munroe 1990; Nyman 1988; Schnelle et al. 2004; Wan 2003). Bliesmer et al. (1998) find that higher licensed nursing hours per resident day are associated with higher quality, indicating a higher rate of discharges and a lower rate of deaths. But, nursing assistants (NAs) as non-licensed nurses are not statistically significant in the discharges and deaths. Munroe (1990) also finds that a higher ratio of registered nurses (RNs) hours has a positive influence on nursing home quality. In particular, the author argues that the

[4]) RNs have a professional education between 2 and 6 years for nursing care. LPNs generally have 1 year of training. NAs provide care on a twenty-four hour basis. They work under the direction of a licensed nurse to assist residents with activities of daily living.

ratio of RN hours per resident day to LPN hours per resident day rather than total hours of RNs per resident day is a better indicator to examine influence of RNs on nursing home quality. Cohen and Spector (1996) examine the effect of nursing staff on service quality measured by mortality, bedsores, and functional status. They find different results by the indicators of service quality. While more RN hours per 100 residents have a positive effect on reducing mortality and bedsores, more LPN hours have a positive effect on functional status. The results imply that RNs and LPNs have different values and roles in improving service quality for residents.

Empirical studies on the effect of nursing staff on nursing home quality have found a positive relationship between two variables. But, they paid little attention to the differences of relative influence on service types provided. For instance, NAs may have a more positive influence than RNs and LPNs in services that do not require professional care.

Administrative staff as well as nursing staff may have an impact on nursing home quality. The administrative staff plays an important role in managing and supervising services provided by nursing homes. Administrative staffs include assistant or associate directors of nursing, nursing managers or directors, and resident care coordinators (Sloane, Sloane, and Harder 1999). Associate or assistant directors of nursing mainly assist in planning with other departments within a health care organization. A nursing manager or director is usually a professional RN who is responsible for nursing care. The director is administratively responsible for managing and supervising nursing services provided by the nursing home. A patient care coordinator is a registered professional nurse who is usually responsible for the direct and indirect nursing care of residents. The coordinator also participates in establishing standards of resident care. Unfortunately, there is little empirical evidence that these administrative staffs have a positive impact on service quality. Although Harrington et al. (2000) examine the effect of administrative staff on service quality measured by several deficiencies, they do not find a consistent statistical significance.

Ownership type is a critical structural factor influencing nursing home quality in that the quality largely depends on the capacity of service providers. About 94 % of U.S. nursing homes consist of for-profits and nonprofits, and two-thirds are for-profit nursing

homes (Harrington and Carrillo 1999; Harrington et al. 2001). Despite this numerical superiority of for-profit nursing homes, many previous studies find that nonprofit nursing homes provide a higher quality than for-profit nursing homes (Aaronson, Zinn, and Rosko 1994; Chou 2002; Greene and Monahan 1981; Hawes and Phillips 1986; Hillmer et al. 2005; Harrington et al. 2001; Spector, Selden, and Cohen 1998). This is a major research concern. Generally, for-profit organizations are considered to pursue profit motives rather than ensure quality of service. Even if they try to improve service quality, such an effort may be effective only if the service type provided is short-term care. As long as their managerial objective is to provide financial returns to investors, it is difficult to expect the high quality of care in a service requiring long-term care such as a nursing home.

Past studies on the effect of chain ownership mainly focused on nursing home costs rather than quality (Cohen and Dubay 1990; Luksetich, Edwards, and Carroll 2000; McKay 1991). There are few studies to examine the effect of chain-affiliated nursing homes on service quality. Hawes and Phillips (1986) indicate that studies on the effect of the chain-affiliated ownership on nursing home quality show mixed findings. While some large chain-affiliated nursing homes provide an acceptable high quality, others seem to provide a low care quality. These different results suggest that all chain nursing homes do not pursue identical organizational goals and exhibit similar behaviors. But, recent studies find that nursing homes with a chain affiliation provide a better quality than non-chain-affiliated nursing homes (Harrington et al. 2001; Wan, Zhang, and Unruh 2006). The authors suggest that the quality of nursing care can be investigated with a comparison between chain and non-chain-affiliated nursing homes. These chain-affiliated nursing homes can have the benefits of more cost savings and information sharing than non-chain-affiliated and thus, these benefits play a positive role in improving service quality.

Size is a structural factor that shows the occupancy capacity of a nursing home. It is usually measured by number of beds. Previous studies find inconclusive results between the number of beds and service quality. Some studies find that the number of beds has a positive effect on service quality because nursing homes having larger numbers of beds provide a wider scope of services (Greene and Monahan 1981;

Riportella-Muller and Slesinger 1982). But, this relationship is possible only if a nursing home has sufficient human and financial resources. In larger nursing homes, more personalized care of residents and the provision of a better environment may be more difficult. In contrast, others find that the number of beds is negatively or insignificantly associated with service quality (Nyman 1988; Wan, Zhang, and Unruh 2006; Zinn, Aaronson, and Rosko 1993).

The relationship between size and quality is partly based on the notion of economies of scale. That is, an increase in size will probably produce greater efficiency and positive outcomes (Davis 1991). But, the number of beds (size) may not be an appropriate indicator to measure scale economies because they exist when long-run average cost declines as output increases (McKay 1991). Instead, occupancy rate is likely to be a more adequate indicator in size-quality relations because it reflects consumer demand driven by the perception of better quality (Davis 1991; Zinn, Aaronson, and Rosko 1993).[5]

Nursing homes have different types of residents, typically referred to as case mix variation. Resident characteristics include age, sex, activities of daily living deficits (ADLs), the need for special treatment, and Medicaid or self-payers. Among these specific characteristics, Medicaid residents are a dominant purchaser of nursing homes that account for approximately 50 % of all nursing home expenditures (Short et al. 1992). The introduction of the Medicaid program also has brought a shift from government to private sector ownership (Mather 1990). The Medicaid program gives financially indigent individuals access to nursing homes by a direct Medicaid reimbursement. Nursing homes are assumed to provide the same level of quality to both private-payers and Medicaid residents because legislation does not allow any discrimination by the source of payment in the provision of services (Gertler 1992). But, a high proportion of the Medicaid residents does not enable certain nursing homes to have sufficient resources that are necessary to provide a high service quality. This may be related to a decrease in motivation for improving nursing home quality.

[5]) Chen and Shea (2004) argue that patient days are a more correct indicator to measure scale economies rather than number of beds and occupancy rate.

Several studies show that the higher proportion of Medicaid residents is associated with a lower quality of nursing home care. Zinn (1994) finds that a higher proportion of Medicaid residents is associated with its lower levels in service quality measured by RN staffing levels and proportion of residents who are not toileted by themselves. Harrington and Swan (2003) also find that Medicaid residents have a negative effect on service quality measured by nurse staffing levels. Their study indicates that a 1 % increase in Medicaid residents decreases total nurse staffing by .01 hours per resident day. These empirical findings imply that there is a negative association between the proportion of Medicaid residents and service quality.

One of the other popular components reflecting resident characteristics is resident case mix. It is often measured by an Activities of Daily Living (ADL) index that means the resident's need for assistance. The ADL score is usually calculated by summing the scores for each of three ADLs (eating, toileting, and transferring). The OSCAR reports an appropriate point scale for each of these three categories ranging from the lowest need for assistance to the highest need for assistance. Past studies on the effect of case mix (ADL index) on service quality show mixed results. While some find that there is a negative association between the ADL index and service quality measured by pressure sores and deficiencies (Grabowski 2001; Harrington et al. 2001), others do not find that there are statistically significant relationship between the ADL index and the service quality (Harrington et al. 2000; Johnson-Pawlson and Infeld 1996).

3.3.2 Process Factors

Process factors have not been extensively explored in the study of nursing home quality due to some difficulties in finding appropriate indicators to measure them (Unruh and Wan 2004). The process factors usually include resident assessment, care plan development, rehabilitative services, nursing care services provided, and nursing care deficiencies. Among these process factors, it seems that nursing care deficiencies are a comprehensive factor including the different process factors listed above.

Deficiency means a finding that a nursing home fails to meet a federal or state requirement. It reflects the adequacy of nursing care provided by a nursing home. In other words, a large number of deficiencies is associated with a greater inadequacy of the nursing care. There are few studies on the effect of deficiency on service quality because

previous studies primarily used it as an indicator to measure service quality. But, it is more reasonable to use deficiency as a predictor influencing service quality because adequacy or inadequacy of nursing care has a positive or negative impact on service quality. The most recent research finds that nursing care deficiencies are negatively associated with service quality measured by one quality index (Wan, Zhang, and Unruh 2006).

Physical restraints are most commonly used as a process factor (Castle 2005; Hillmer et al. 2005). They are defined as devices, material, and equipment which: 1) are attached to or are adjacent to the patient's body; 2) prevent free bodily movement to a position of choice; and 3) cannot be controlled or easily removed by the patient (Stilwell 1988, 42). The use of physical restraints is one of the most negative features of nursing home service. Major reasons that nursing homes use the physical restraints are to protect: 1) facilities from liability; 2) residents from fall; 3) agitated residents; and 4) other medical devices (Macpherson et al. 1990; Miles and Irvine 1992). Immobility resulting from the use of the physical restraints generates potential negative consequences for resident health. In particular, this immobility increases the likelihood of pressure sores, infection, mortality, or mental depression (Lofgren et al. 1989; Miles and Irvine 1992; Mion et al. 1989; Zinn, Aaronson, and Rosko 1993). For this reason, physical restraints may be negatively associated with service quality.

3.3.3 Environmental Factors

Market competition is one of the key environmental factors. A growing body of research has examined how market competition among different organizational ownerships, such as for-profits, nonprofits, and governments, within a specific service influences the service quality. Despite the significance of market competition, there is little empirical literature on how market competition between different organizational ownerships influences service quality. Marwell and McInerney (2005) propose three possible market types of cross-sectoral competition between for-profits and nonprofits in any market that addresses a social need: a stratified market, a displaced market, and a defended market. The stratified market means that both for-profits and nonprofits have split consumers. While the for-profits serve wealthy consumers who have ability of self-payment, the nonprofits serve poor consumers who do not have full information for

evaluating service quality. The displaced market is formed in a service area in which a market cannot be maintained by the power of later-entering for-profits. Lastly, the defended market means that nonprofits are able to hold their position despite for-profit incursions into a market. They maintain the position by using strategies such as fundraising, regulation, legitimacy, or other tools of defense.

Empirical studies on these competitive markets have focused on comparing the relative quality of for-profits, nonprofits, and sometimes governments in a specific service. Market competition is also an important factor influencing service quality in a nursing home service because for-profit, nonprofit, and government-owned nursing homes compete with each other to provide a better service quality. Any market concentration of a few dominant nursing homes tends to decrease competition among service providers and thus results in a negative impact on quality. A high market concentration implies a market structure with less competitive pressure (Davis 1993). Previous literature shows mixed findings about the relationship between market competition and service quality. Some find that nursing home quality is higher in more concentrated markets (Zinn 1994; Zinn, Aaronson, and Rosko 1993). As a result, Zinn (1994) argues that a market concentration does not increase the power of service providers in the nursing home industry. Rather, other structural characteristics of nursing home markets diminish the opportunity to exert this power. Thus, this market concentration does not necessarily have a negative effect on service quality.

On the other hand, others find that market competition of nursing home providers has a positive impact on service quality (Grabowski 2001; Grabowski and Hirth 2003). Their argument is that the market competition motivates service providers to respond to consumer demand, and it brings a synergy effect to provide a better service quality. In particular, Hirth (1999) emphasizes that an increase in non-profit market share improves for-profit nursing home quality as well as overall nursing home quality through a spillover effect.

Overall, it seems that greater market competition of service providers is a necessary condition to provide a high nursing home quality. A market concentration by a few service providers may generate a moral hazard and thus make it difficult to maintain a better institutional balance among nursing home service providers.

The demographic characteristics of a county in which a nursing home is located may be associated with service quality. In particular, elderly population over the age of 65 is a major target group for nursing homes. Previous studies show different research findings about the relationship between elderly population and service quality. While some find that the elderly population over the age of 65 is negatively associated with service quality (Cohen and Spector 1996; Grabowski and Hirth 2003; Spector, Selden, and Cohen 1998), others find that it is positively associated with service quality (Wan, Zhang, and Unruh 2006; Zinn, Aaronson, and Rosko 1993). These different results partly stem from the use of different indicators to measure service quality.

Nursing homes located in a wealthier region face a greater demand for higher quality because self-paying residents having high incomes tend to select a nursing home providing a high quality (Unruh and Wan 2004). In areas in which the median income is higher than other areas, nursing homes may be forced to compete on the basis of quality for providing a better service. Empirical evidence supports this positive influence of median income on nursing home quality (Rosko et al. 1995; Spector, Selden, and Cohen 1998; Zinn, Aaronson, and Rosko 1993).

I have addressed structural, process, and environmental factors. The structure, process, and environment (SPE) framework is presented in figure 3.1. The SPE framework provides a significant contribution to the study of nursing home quality in that it fully covers key predictors influencing nursing home quality and includes environmental factors that are not dealt with the previous studies. While the structural and process factors include endogenous variables, the environmental factors include exogenous variables. In the next chapter, I describe the method of data collection, sample description, and unit of analysis and set up hypotheses about the relationships between the SPE factors and service quality.

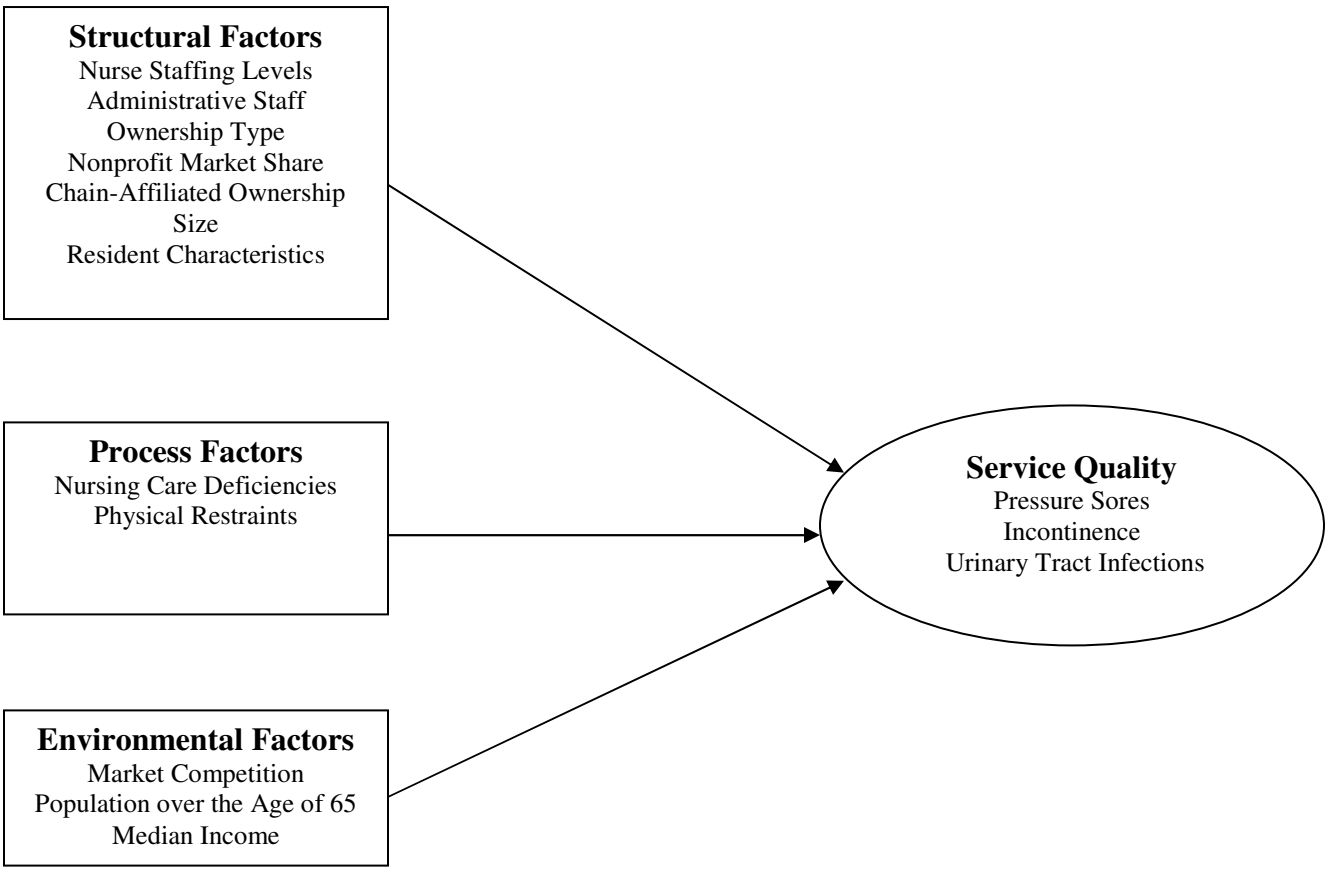

Figure 3.1 A Theoretical Framework for Determinants of Nursing Home Quality

CHAPTER 4
RESEARCH METHODS AND HYPOTHESES

4.1 Data Collection, Sample Description, and Unit of Analysis

The primary data sources of this study are the Online Survey Certification and Reporting (OSCAR) system database and the Minimum Data Set (MDS) repository. The OSCAR database contains information about nursing homes certified federally for Medicare and Medicaid in the United States. The certified nursing homes provided by this OSCAR data represent about 96 % of all nursing homes nationwide (Grabowski and Hirth 2003; Strahan 1997). State survey agencies are responsible for entering survey information for each nursing home no later than every 15 months in the OSCAR database to verify whether nursing homes are in compliance with federal regulatory requirements. The data for quality measures come from the MDS repository. The MDS is collected on regular intervals for every resident in a Medicare or Medicaid certified nursing home. Information is collected on the resident's health, physical functioning, mental status, and general well-being. Data about resident characteristics are obtained from Centers for Medicare & Medicaid Services (CMS).

The data for this study are collected within the time interval of January 2004 through June 2005 and contain federally certified nursing homes participating in both Medicare and Medicaid services. If a nursing home was surveyed multiple times during this interval, the most recent survey results were included in the data set. In order to eliminate extreme outliers, I exclude nursing homes: 1) having 15 or fewer residents (Harrington et al. 2000; Wan, Zhang, and Unruh 2006); 2) that do not participate in both

Medicare and Medicaid services; and 3) that do not have nursing staff hours.[6] After I conduct these procedures, this study includes a final sample of 13,611 nursing homes across fifty states. Of the 13,611 nursing homes, for-profits (9490 nursing homes) account for 69.7 % of the sample, nonprofits (3480 nursing homes) account for 25.6 % of the sample, and government-owned (641 nursing homes) account for 4.7 % of the sample. Unlike studies which utilize a sample from one state, this study includes a national sample of nursing homes across fifty states. This permits a more complete examination and generalization of research results. The full breakdown of the study's sample by ownership type and affiliation is laid out in table 4.1 below.

Table 4.1 Nursing Homes by Ownership Types

Ownership Types	Frequency	Percent
For-Profit- Corporation	8,173	60.0
For-Profit- Individual	298	2.2
For-Profit- Partnership	1,019	7.5
For-Profits	9,490	69.7
Nonprofit- Church Related	728	5.3
Nonprofit- Corporation	2,554	18.8
Nonprofit- Other	198	1.5
Nonprofits	3,480	25.6
Government- City	87	0.6
Government- City/County	51	0.4
Government- County	346	2.5
Government- Federal	2	0.0
Government- Hospital District	93	0.7
Government- State	62	0.5
Governments	641	4.7
Total	13,611	100.0

[6]) The reason that I do not include nursing homes under 15 residents is that most of the nursing homes have extremely higher staffing hours to an extent judged to be unlikely to be accurate. In addition, the nursing homes usually do not provide both Medicare and Medicaid services.

Unit of analysis of this study is each nursing home. Values of all variables used in the study are coded by each nursing home. For example, 85 in number of beds mean that the nursing home coded as 85 has 85 beds. But, values of nonprofit market share and environmental factors are measured by the county in which each nursing home is located.

4.2 Variables, Measurements, and Hypotheses

4.2.1 Dependent Variables and Measurements

How to measure nursing home quality is a critical issue. Although quality has been measured with a number of indicators in the literature, there are no generally accepted measures at present. Each measure has its advantages and disadvantages (Nyman 1988). In this regard, it is reasonable to maximize the appropriateness of indicators to measure the quality and minimize their weaknesses. The Minimum Data Set (MDS) provides twelve quality measures.[7] They are required to do a comprehensive assessment of each resident's functional capabilities and medical needs. Several studies have used these measures for service quality of nursing homes (Aaronson, Zinn, and Rosko 1994; Cherry 1991; Cohen and Spector 1996; Grabowski and Hirth 2003; Spector, Selden, and Cohen 1998; Wan, Zhang, and Unruh 2006; Zhang and Grabowski 2004).

In this study, my selection of quality indicators is based on their availability in the OSCAR and MDS data, frequency used in previous studies, and outcome-oriented indicators. Based on the acceptance of these criteria, I select three quality measures: pressure sores, bladder or bowel incontinence, and urinary tract infections. Pressure sores are the most commonly used quality indicator. In particular, the pressure sores are a good measure of quality because they have preventable and treatable conditions (Kane, Ouslander, and Abrass 1989). Bladder or bowel incontinence and urinary tract infections are also good measures of quality for identifying functional decline and infection control. Zimmerman et al. (1995) find that these three measures have relatively high accuracy in pilot test investigations. Pressure sores, bladder or bowel incontinence, and urinary tract infections are negative measures of quality. In other words, a higher proportion of these

[7]) The twelve quality measures for a long-term care include: limitation of daily activities, severe pain, low and high pressure sores, physical restraints, depression or anxiety, bowel or bladder incontinence, indwelling catheter, bedfast, bed mobility, urinary tract infection, and weight loss.

indicators indicates a lower service quality. Each indicator is measured by the percentage of residents who have pressure sores, bladder or bowel incontinence, and urinary tract infections in each nursing home.

4.2.2 Independent Variables and Measurements-- Structural Factors

Table 4.2 Variable Definitions

Variables	Definitions
Pressure Sores	Percentage of residents with pressure sores in each nursing home
Bladder or Bowel Incontinence	Percentage of residents with incontinence in each nursing home
Urinary Tract Infections	Percentage of residents with urinary tract infections in each nursing home
RN Hours	Average RN hours per resident day
LPN Hours	Average LPN hours per resident day
NA Hours	Average NA hours per resident day
Nursing Director Hours	Average Nursing Director hours per resident day
Ownership Type	Nonprofit- 1, Otherwise-0
Nonprofit Market Share	The percentage of nonprofit nursing homes in the county
Chain Ownership	Chain-affiliated ownership- 1, Otherwise-0
Number of Beds	The total number of certified beds in each nursing home
Occupancy Rate	The percentage of certified beds occupied in each nursing home
% of Medicaid Residents	The percentage of Medicaid residents in each nursing home
% of Residents not Eating	The percentage of residents who do not eat by themselves without any skill or instrument
Nursing Care Deficiencies	The total number of federal citations found in each nursing home
% of Physical Restraints	The percentage of residents with physical restraints in each nursing home
Market Competition (Herfindahl Index)	Squared market shares of all nursing homes in the county
Population over the Age of 65	The percentage of individuals who are over the age of 65 in the county in which each nursing home is located
Median Income	Amount of household median income in the county

In this study, I include nurse staffing levels, administrative staff (nursing director), ownership type, nonprofit market share, chain-affiliated ownership, size, and resident characteristics as structural factors, nursing care deficiencies and physical restraints as process factors, and finally market competition, population over the age of 65, and median income as environmental factors. Definitions for variables used for the analysis are presented in table 4.2.

4.2.2.1 Nurse Staffing Levels

Nursing staff is an important human resource influencing nursing home quality. Skilled care of the nursing staff has a positive impact on improving the quality of care for residents. The previous empirical literature also supports its positive relationship with the quality of care. In particular, RNs who have more professional skills have a stronger effect on service quality than LPNs (Cohen and Spector 1996). But, it does not seem that NAs who do not have professional knowledge and skills for nursing care have a positive effect on the service quality. Thus, I establish three hypotheses about the relationship between nurse staffing levels and service quality. In this study, RNs, LPNs, and NAs are measured by average hours per resident day.

H1-1: Higher RN hours will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.
H1-2: Higher LPN hours will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.
H1-3: Higher NA hours will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.2.2 Administrative Staff-- Nursing Director

Administrative staff helps to improve nursing home quality by effectively managing and supervising nursing homes to provide residents with better services. In professional management, nursing directors play an important role in developing and implementing the philosophy and objectives of nursing services. They are usually responsible for planning the entire kind and amount of resident care. Thus, I expect that

nursing directors will be positively associated with service quality. In this study, the nursing director is measured by average hours per resident day.

H2: Higher nursing director hours will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.2.3 Ownership Type

Generally, the relationship between ownership type and service quality focuses on whether quality ultimately differs between for-profit and nonprofit nursing homes. The managerial objective of for-profit nursing homes is to seek profit maximization. This objective may lead managers to favor financial returns at the expense of ensuring service quality. On the other hand, because nonprofit nursing homes are not bound by profit distribution, net revenues are used to improve service quality for residents. Based on these different organizational characteristics, I set up the following hypothesis. In this study, ownership type is measured as a dummy variable coded 1 if a nursing home is owned by a nonprofit organization.

H3: Nonprofit nursing homes will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections than for-profit nursing homes.

4.2.2.4 Nonprofit Market Share

Although the effect of ownership type on nursing home quality is usually measured as a dummy variable, it does not fully capture the ownership effect. As an alternative, a measure of nonprofit market share may help to fill this lack. An increase in the nonprofit market share should be positively associated with the improvement of for-profit and overall nursing home quality through a competitive spillover effect (Grabowski and Castle 2003; Grabrowski and Hirth 2003; Hirth 1999). In this study, nonprofit market share is measured by the percentage of nonprofit nursing homes in the county.

H4: An increase in nonprofit market share will be associated with higher quality of care in both overall nursing homes and for-profit nursing homes and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.2.5 Chain-Affiliated Ownership

There are few empirical studies on the effect of chain ownership on nursing home quality as most of the studies focus on the relationship between chain ownership and nursing home cost. The general perception seems to be that the chain ownership has a positive effect on providing lower nursing home costs because its increase brings the effect of cost savings by decrease in input prices as output increases (McKay 1991). The effect of cost savings may encourage the chain ownership to increase service quality because the increase of surplus stimulates the improvement of the quality. In this study, chained-affiliated ownership is measured as a dummy variable coded 1 if a nursing home is owned by a chained-affiliated nursing home.

H5: Chain-affiliated nursing homes will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections than non-chain-affiliated nursing homes.

4.2.2.6 Size

It seems that the increase of organizational size has a potential benefit to improve service quality by providing more services. An important condition of this assumption, however, depends on trained and professional staff who can provide residents with skilled care services. Considering that many nursing homes still suffer from lack of professional nursing staffs, such as RNs and LPNs, it does not seem that the increase of number of beds may be positively associated with service quality.

Rather, occupancy rate related to the degree of capacity utilization in a nursing home seems to be positively associated with service quality because it reflects preferences of residents who hope to receive the better services. The increase in the occupancy rate means fewer empty beds, and it may encourage a nursing home to improve service quality to meet residents' needs. Thus, I establish two hypotheses about

relationships between size and quality. In this study, number of beds and occupancy rate are measured by the total number of certified beds and the percentage of certified beds occupied.

H6-1: The larger number of beds will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.
H6-2: The higher occupancy rate will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.2.7 Resident Characteristics-- Case Mix

Nursing homes vary in the types of residents typically referred to as case mix variation (Harrington et al. 2000). While Medicaid residents are associated with payer mix, eating, toileting, and transferring are associated with resident mix. Nursing home residents consist of private payers and public payers. Most of the public payers are Medicaid residents. Services for the Medicaid residents in nursing homes are directly reimbursed by Medicaid. Generally, the price charged to private pay residents is higher than that of public pay residents (Cohen and Spector 1996). Private payers tend to require a higher service quality that corresponds to their price. To respond to their requirement, nursing homes try to improve the service quality. Accordingly, an increase in Medicaid residents results in a relative decrease of private pay residents and thus it may be negatively associated with service quality. Previous empirical studies support this negative relationship between Medicaid residents and service quality (Aaronson, Zinn, and Rosko 1994; Gertler 1992; Harrington and Swan 2003; Nyman 1988; Zinn 1994). Based on empirical results of these studies, I expect there will be a negative association between Medicaid residents and service quality. In this study, Medicaid residents are measured by the percentage of Medicaid residents among total residents in each nursing home.

Several indicators of case mix regarding the condition of residents are negative measures. They include the proportion of residents who are not bathing, toileting, eating, dressing, or transferring by themselves. It is not surprising to expect that a higher percentage of these residents would be negatively associated with nursing home quality.

In this study, I measure case mix as the proportion of residents who do not eat by themselves as the most critical indicator.[8]

H7-1: The higher proportion of Medicaid residents will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.
H7-2: The higher proportion of residents who do not eat by themselves will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.3 Process Factors

4.2.3.1 Nursing Care Deficiencies

Nursing care deficiencies aim to assess the adequacy of nursing care in a nursing home. Their assessment is annually made by state agencies' surveyors to determine the adequacy of multiple nursing activities. The frequency of deficiency findings in a nursing home reflects whether it provides adequate nursing care to residents. In other words, the more findings of deficiencies may be associated with poorer nursing care. Recent empirical studies find that nursing care inadequacy has a negative effect on nursing care quality (Wan 2003; Wan, Zhang, and Unruh 2006). Based on these empirical studies, I expect that nursing care deficiencies will be associated with lower quality of care. In this study, nursing care deficiencies are measured by the total number of federal citations of deficiencies.

H8: The larger number of nursing care deficiencies will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.3.2 Physical Restraints

[8]) Residents who do not eat, use the toilet, and transfer by themselves are usually used to measure case mix. But, there is multicollinearity among these three measures. Thus, I include only the residents who do not eat by themselves as the most comprehensive indicator.

Physical restraints are an important process predictor influencing service quality because they are associated with an increased risk of several quality measures of care such as pressure sores, morbidity, mortality, and infection. Lower levels of the use of physical restraints are generally regarded as higher quality (Grabowski and Castle 2004). Previous literature used physical restraints as an indicator to measure service quality. But, it is more reasonable that physical restraints are a process-oriented predictor influencing service quality rather than an indicator to measure it. In particular, their use negatively affects the life quality of residents (Castle and Mor 1998). Thus, I expect physical restraints have a negative influence on service quality. In this study, the physical restraints are measured by the percentage of residents with physical restraints in each nursing home.

H9: The higher proportion of residents with physical restraints will be associated with lower quality of care and higher numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.4 Environmental Factors

4.2.4.1 Market Competition

A mixed market of for-profits, nonprofits, and governments in the nursing home industry increases the likelihood for competition among these three organizational ownerships. Generally, when a market share is concentrated on a few large organizations, competition tends to be diminished. Organizations that command a large share of the market are likely to dominate the production of goods or services provided, and decide the price of these goods or services. Under this circumstance, it is difficult to expect the improvement of service quality. If this argument is true in the nursing home industry, a market concentration may be negatively associated with service quality. But, competition offers an institutional arrangement that service providers coexist, and their competition facilitates motivation to provide a better service quality. Thus, I expect there will be a positive association between market competition and service quality. A Herfindahl Index is often used to measure market competition, and it is a negative measure in relation to the competitiveness of a market. The index is constructed by

summing the squared market shares of all nursing homes in the county. It ranges from 0 to 1, with higher values signifying a greater concentration of nursing homes (Grabowski 2001, 558).[9]

H10: The higher market competition will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.4.2. Population over the Age of 65

Nursing homes primarily aim to care for the health of elderly people who have physical and mental impairments. A larger proportion of elderly people in the county demographics increases the likelihood of potential diseases, and such diseases may increase the demands of the elderly people using nursing homes. Considering that nursing homes should promptly respond to the demand of target groups such as elderly people, I expect that there will be a positive association between the elderly population and service quality. In this study, the elderly population is measured by the percentage of individuals who are over the age of 65 in the county in which each nursing home is located.

H11: The higher proportion of individuals who are over the age of 65 will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

4.2.4.3. Median Income

Nursing homes in more affluent areas are likely to include more private pay residents than Medicaid residents because the private payers generally have a higher income. Nursing homes compete with each other to provide a better quality for private pay residents (Nyman 1988). Thus, the median income of residents who live in the county in which the nursing home is located, may have a positive impact on service

[9]) For convenience of interpretation, I measure market competition as values subtracted from 1 again in the Herfindahl Index.

quality based on their competition (Zinn, Aaronson, and Rosko 1993). In contrast, a greater proportion of Medicaid residents who have less income may reduce incentives to provide a better service quality. Thus, I set up a hypothesis about the relationship between median income and service quality. In this study, median income is measured by the amount of household median income in the county in which each nursing home is located.

H12: A higher level of median income will be associated with higher quality of care and lower numbers of pressure sores, bladder or bowel incontinence, and urinary tract infections.

Table 4.3 Summary of Relationships between Variables and Hypotheses

Independent Variables	Dependent Variable	Expected Direction	Direction of Coefficients
H1-1: RN Hours per Resident Day	Service Quality	Positive	Negative
H1-2: LPN Hours per Resident Day	Service Quality	Positive	Negative
H1-3: NA Hours per Resident Day	Service Quality	Negative	Positive
H2: Nursing Director Hours	Service Quality	Positive	Negative
H3: Ownership Type- Nonprofit	Service Quality	Positive	Negative
H4: Nonprofit Market Share	Service Quality	Positive	Negative
H5: Chain-Affiliated Ownership	Service Quality	Positive	Negative
H6-1: Number of Beds	Service Quality	Negative	Positive
H6-2: Occupancy Rate	Service Quality	Positive	Negative
H7-1: % of Medicaid Residents	Service Quality	Negative	Positive
H7-2: % of Residents not Eating	Service Quality	Negative	Positive
H8: Nursing Care Deficiencies	Service Quality	Negative	Positive
H9: % of Physical Restraints	Service Quality	Negative	Positive
H10: Market Competition	Service Quality	Positive	Negative
H11: Population over the Age of 65	Service Quality	Positive	Negative
H12: Median Income	Service Quality	Positive	Negative

CHAPTER 5
RESULTS AND ANALYSIS

5.1 An Analytical Model for Determinants of Nursing Home Quality

This study employs Ordinary Least Squares (OLS) regression analysis. The equation is as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \varepsilon$$

I examined whether my analysis model has the problem of multicollinearity and auto-correlation. Based on the multicollinearity and auto-correlation statistics, I do not find that there are problems for them.[10]

Y= Nursing Home Quality

β_0 = Intercept

X_1 = RN Hours per Resident Day

X_2 = LPN Hours per Resident Day

X_3 = NA Hours per Resident Day

[10]) To diagnose multicollinearity, I examined tolerance statistics. The tolerance is a measure of the correlation between the predictor variables and can vary between 0 and 1. In other words, it provides an acceptable level about multicollinearity. Although there is no absolute criterion for multicollinearity, we doubt there is multicollinearity if tolerance values are less than .30. In my model, I find tolerance values are more than .60. I also examined Durbin-Watson to check auto-correlation. It ranges between 1.5 and 2.0. Thus, I judge that there is no problem of auto-correlation.

X_4 = Nursing Director Hours per Resident Day

X_5 = Ownership Type

X_6 = Nonprofit Market Share

X_7 = Chain-Affiliated Ownership

X_8 = Number of Beds

X_9 = Occupancy Rate

X_{10} = % of Medicaid Residents

X_{11} = % of Residents Who do not Eat by Themselves

X_{12} = Number of Nursing Care Deficiencies

X_{13} = % of Physical Restraints

X_{14} = Market Competition

X_{15} = Population over the Age of 65

X_{16} = Median Income

ε = Error Term

5.2 Descriptive Statistics on Variables

Descriptive statistics for the total sample used in this study are reported in Table 5.1. Means and standard deviations of all variables are reported. Table 5.2, 5.3, and 5.4 display means and standard deviations of all variables by ownership types. As can be seen in Table 5.2, 5.3, and 5.4, government-owned nursing homes have more average nursing hours per resident day than for-profit and nonprofit nursing homes, although the differences of the means are relatively small. Previous studies find the same result as this study (Cohen and Spector 1996; Elwell 1984). This result may stem from the fact that the average resident number in government-owned nursing homes is higher than that of for-profit and nonprofit nursing homes, so that nursing staffs in the government-owned nursing homes have relatively more hours caring for residents. In the next part, I will explain in detail the relationship between nursing staff hours and nursing home quality.

The mean proportion of Medicaid residents in government-owned nursing homes is higher than that of Medicaid residents in for-profit and nonprofit nursing homes. In particular, the mean of Medicaid residents in for-profit nursing homes is higher than that of Medicaid residents in nonprofit nursing homes. While the mean of Medicaid residents

in for-profit nursing homes is 67.71 %, as can be seen, that of Medicaid residents in nonprofit nursing homes is 58.16 %. This result may be interpreted that economically indigent Medicaid residents choose more for-profit nursing homes than nonprofit nursing homes.

The number of nursing care deficiencies and the percent of physical restraints are the highest in for-profit nursing homes among the three different organizational ownerships. The average number of the deficiencies and the average percent of physical restraints in the for-profit nursing homes are 9.73 and 8.45 %. On the other hand, nonprofit nursing homes show the lowest number of nursing care deficiencies (8.22) and the lowest percentage of physical restraints (6.33 %).

In the Herfindahl Index measuring market competition, for-profit and nonprofit nursing homes indicate the same mean index (.91). Government-owned nursing homes have a lower mean index (.79) than both nursing homes. In median income, the average median income of counties in which nonprofit nursing homes ($37,843) are located is higher than that of counties in which for-profit ($37,234) and government-owned nursing homes ($35,839) are located. But, their differences are relatively small. Based on this result, it seems that affluent residents tend to choose nonprofit nursing homes rather than for-profit and government-owned nursing homes.

Each of the average residents with pressure sores, bladder or bowel incontinence, and urinary tract infections accounts for 7.33 %, 4.12 %, and 8.75 % of total residents in each nursing home. In the comparison of these three service quality measures by three different organizational ownerships, the proportion of the quality measures is the highest in for-profit nursing homes, although their differences are small. On the other hand, the proportion of incontinence is slightly higher in government-owned nursing homes (3.86 %) than nonprofit nursing homes (3.57 %).

Table 5.1 Descriptive Statistics by Total Sample

Variables	Total Sample	Mean	Standard Deviation
RN Hours per Resident Day	13,571	0.56	0.38
LPN Hours per Resident Day	13,571	0.74	0.40
NA Hours per Resident Day	13,571	2.34	0.76
Nursing Director Hours per Resident Day	12,787	1.14	1.10
Chain-Affiliated Ownership	13,611	0.55	0.50
Number of Beds	13,611	112.58	64.17
Occupancy Rate	13,508	85.96	12.95
% of Medicaid Residents	12,787	65.30	18.42
% of Residents not Eating	12,787	17.47	10.45
Number of Deficiencies	12,787	9.30	6.94
% of Physical Restraints	12,787	7.83	8.88
Market Competition	13,611	0.91	0.22
Population over the Age of 65	13,611	13.71	3.80
Median Income	13,611	37324.33	8804.05
% of Residents with Pressure Sores	12,787	7.33	5.13
% of Residents with Incontinence	12,787	4.12	6.50
% of Residents with Urinary Tract Infections	12,603	8.75	5.32

Table 5.2 Descriptive Statistics by Ownership Type-- For-Profits

Variables	Number of Nursing Homes	Mean	Standard Deviation
RN Hours per Resident Day	9,464	0.51	0.30
LPN Hours per Resident Day	9,464	0.74	0.36
NA Hours per Resident Day	9,464	2.25	0.75
Nursing Director Hours per Resident Day	8,931	1.15	1.26
Chain-Affiliated Ownership	9,490	0.63	0.48
Number of Beds	9,490	111.82	52.00
Occupancy Rate	9,441	84.81	13.23
% of Medicaid Residents	8,931	67.71	16.52
% of Residents not Eating	8,931	17.77	10.24
Number of Deficiencies	8,931	9.73	7.09
% of Physical Restraints	8,931	8.45	9.06
Market Competition	9,490	0.91	0.21
Population over the Age of 65	9,490	13.51	3.75
Median Income	9,490	37,234.31	8,796.73
% of Residents with Pressure Sores	8,931	7.46	4.95
% of Residents with Incontinence	8,931	4.34	6.41
% of Residents with Urinary Tract Infections	8,927	8.89	5.41

Table 5.3 Descriptive Statistics by Ownership Type-- Nonprofits

Variables	Number of Nursing Homes	Mean	Standard Deviation
RN Hours per Resident Day	3,469	0.68	0.50
LPN Hours per Resident Day	3,469	0.75	0.48
NA Hours per Resident Day	3,469	2.51	0.75
Nursing Director Hours per Resident Day	3,265	1.11	0.41
Chain-Affiliated Ownership	3,480	0.43	0.50
Church-Related Ownership	3,480	0.21	0.41
Number of Beds	3,480	109.83	72.16
Occupancy Rate	3,436	88.89	11.68
% of Medicaid Residents	3,265	58.16	21.10
% of Residents not Eating	3,265	16.49	10.84
Number of Deficiencies	3,265	8.22	6.38
% of Physical Restraints	3,265	6.33	8.06
Market Competition	3,480	0.91	0.23
Population over the Age of 65	3,480	14.10	3.90
Median Income	3,480	37,843.31	8,915.63
% of Residents with Pressure Sores	3,265	7.11	5.52
% of Residents with Incontinence	3,265	3.57	6.71
% of Residents with Urinary Tract Infections	3,115	8.43	5.07

Table 5.4 Descriptive Statistics by Ownership Type-- Governments

Variables	Number of Nursing Homes	Mean	Standard Deviation
RN Hours per Resident Day	638	0.71	0.55
LPN Hours per Resident Day	638	0.77	0.45
NA Hours per Resident Day	638	2.64	0.80
Nursing Director Hours per Resident Day	591	1.15	0.95
Chain-Affiliated Ownership	641	0.76	0.27
Number of Beds	641	138.70	135.82
Occupancy Rate	631	87.05	12.83
% of Medicaid Residents	591	68.40	19.35
% of Residents not Eating	591	18.35	11.10
Number of Deficiencies	591	8.85	7.07
% of Physical Restraints	591	6.81	9.42
Market Competition	641	0.79	0.33
Population over the Age of 65	641	14.72	3.79
Median Income	641	35,839.22	8,069.69
% of Residents with Pressure Sores	591	6.58	5.33
% of Residents with Incontinence	591	3.86	6.63
% of Residents with Urinary Tract Infections	561	8.17	4.99

5.3 Results and Analysis for Determinants of Nursing Home Quality

Table 5.6 displays OLS regression results for determinants of nursing home quality in for-profit and nonprofit nursing homes.[11] Most independent variables have a statistical significance on the three service quality measures, although a few variables are not statistically significant on the service quality measures. This result implies that the structure, process, and environment (SPE) framework presented in this study provides a useful tool for explaining nursing home quality. The R^2 of the models ranges from .04 to .19. As a key variable of my model, ownership type has a positive influence on service quality measured by pressure sores and urinary tract infections, except for incontinence.[12] This result implies that nonprofit nursing homes provide a higher service quality than for-profit nursing homes. As another key variable, nonprofit market share also has a positive effect on the service quality measures with the expected direction, although the pressure sores quality measure is not statistically significant. As expected, it contributes to improvement of overall and for-profit nursing home quality by decreasing the percentage of residents with bladder or bowel incontinence and urinary tract infections.

Contrary to my expectation, chain-affiliated ownership, however, does not have a positive effect on service quality. Rather, it has a negative impact on service quality by increasing the percentage of residents with incontinence and urinary tract infections. Finally, market competition shows mixed results. While market competition has a positive effect on the incontinence quality measure, it has a negative effect on the pressure sores quality measure. The influence of market competition on service quality varies by service types provided.

5.3.1 Results and Analysis of Structural Factors

Nurse staffing levels including RNs, LPNs, and NAs have a consistent statistical significance on service quality measures. Contrary to my expectation, however, RN and LPN hours do not have a positive effect on three quality measures. Rather, these RN and LPN hours are positively associated with poorer quality of care. In other words, increase

[11]) In a pooled analysis model, I do not include government-owned nursing homes because for-profit and nonprofit nursing homes are mainly compared as counterparts for examining the effect of ownership type on nursing home quality.

[12]) In a regression model about incontinence quality measure that does not include nonprofit market share, ownership type has a positive influence on incontinence.

of one unit in RN and LPN hours per resident day does not reduce the proportion of residents with pressure sores, bladder or bowel incontinence, and urinary tract infections. Rather, increase of one unit in NA hours per resident day has a positive effect on service quality by decreasing residents with pressure sores by .51 % at the .01 level and incontinence by .63 % at the .10 level.

Recently, Zhang and Grabowski (2004) argue that these counterintuitive results may stem from the possibility of a nonlinear association between nurse staffing levels and nursing home quality. That is, nursing staff hours have a positive effect on service quality until a certain point where the nursing staff hours actually begin to have a negative effect with additional nursing staff hours. A report by Abt Associates (2001) reveals that there is no significant quality improvement after some thresholds, suggesting thresholds for the nursing home staff hours. These thresholds are .75 RN hr/resident day, 1.3 LPN hr/resident day, and 2.78 NA hr/resident day. If these thresholds are accepted as minimum staffing standards, they may be an important standard in understanding the relationship between nurse staffing levels and service quality.

In order to identify any nonlinearity between nurse staffing levels and nursing home quality, I examine scatterplots of two variables. As a result, I find there is a nonlinear relationship between RN, LPN hours and nursing home quality. The relationship shapes a convex curve indicating a negative coefficient. Polynomials are power transformations of an independent variable that adds a nonlinear component for each additional power of the independent variable (Hair, Jr, Anderson, Tatham, and Black 1998, 169). The power of 1 (X^1) represents the linear component and the power of 2 which is the variable squared (X^2) represents the quadratic component. Thus, I test the multivariate polynomial models by adding nursing staff hours squared.

Table 5.6 presents OLS regression results for determinants of nursing home quality where squared staff hours are included. It shows that squared RN and LPN hours have a positive effect on all nursing home quality measures, except for squared RN hours in an incontinence quality measure. But, NA hours squared do not have a consistent statistical significance on nursing home quality. The positive effects of these squared RN and LPN hours on service quality support the hypothesis that there is a nonlinear relationship between RN, LPN hours and service quality.

To calculate a specific threshold of RN hours on nursing home quality, as an example, I employ a curvilinear model with the equation below;

$Y = b_0 + b_1X_1 + b_2X_1^2$

Y= pressure sores

b_0 = intercept

b_1X_1 = linear effect of RN hours

$b_2X_1^2$ = curvilinear effect of RN hours

$$\frac{dy}{dx_1} = b_1 + 2b_2X_1 = 0$$

$$2b_2X_1 = -b_1$$

$$X_1 = -\frac{b_1}{2b_2}$$

If $b_1 = 2.86$ and $b_2 = -.24$

$$X_1 = -\frac{2.86}{2\,(-.24)} = 5.96$$

This means that RN hours decrease the proportion of residents with pressure sores up to 5.96 hours, but the RN hours do not decrease their proportion after 5.96 hours are achieved.

Nursing director hours do not have a statistical significance on all three nursing home quality measures. The nursing director hours are statistically significant at the .05 level only for pressure sores. The coefficient means that an increase of one unit in

nursing director hours decreases residents with pressure sores by .26 %. This result provides a partial support of a hypothesis that managerial aspects in nursing services may have a positive influence on nursing home quality.

As noted earlier, ownership type as a key variable is associated with a higher nursing home quality by decreasing the proportion of residents with pressure sores and urinary tract infections. Nonprofit nursing homes have a greater decrease in residents with pressure sores by .42 % and residents with urinary tract infections by .57 % than for-profit nursing homes. The coefficients on the nonprofit dummy variable are statistically significant at the .01 level for pressure sores and urinary tract infections quality measures. But, it is difficult to say that the results imply that nonprofit nursing homes provide a better service quality than for-profit nursing homes. Although the dummy variable captures the effect of ownership on service quality, it provides only partial estimates of the overall ownership effect because it does not account for the spillover effect of the nonprofits on nursing home quality (Grabowski and Hirth 2003). Rather, nonprofit market share may capture this spillover effect of the nonprofits on for-profit nursing home quality.

Table 5.6 displays that an increase in nonprofit market share is associated with high nursing home quality in incontinence and urinary tract infections quality measures, except for pressure sores quality measure. The results imply that a 1 % increase in the nonprofit market share decreases residents with incontinence by .013 % and residents with urinary tract infections by .009 %. Table 5.8 and 5.9 also show that this nonprofit market share has a positive influence on for-profit nursing home quality. The nonprofit market share coefficients are statistically significant at the .01 level for incontinence and urinary tract infections quality measures. The results support a hypothesis that an increase in nonprofit market share leads to improvement of overall and for-profit nursing home quality through a positive spillover effect.

Chain-affiliated ownership is statistically significant at the .01 level for bladder or bowel incontinence and urinary tract infections quality measures, but not for the pressure sores quality measure. But, the direction of the coefficients is the opposite my expectation. A 1 unit increase in chain-affiliated nursing homes reveals more residents with bladder or bowel incontinence by .49 % and urinary tract infections by .40 % than

non-chain-affiliated nursing homes. I expected that the chained-affiliated nursing homes would have a positive influence on service quality by saving costs and resources through a cooperative network among chain-affiliated nursing homes. While the chain-affiliated nursing homes have a positive effect on cost savings (Cohen and Dubay 1990; Luksetich, Edwards, and Carroll 2000; McKay 1991), it does not seem that they have such a positive influence on service quality.

While a certified number of beds is negatively associated with nursing home quality measures, as expected, occupancy rate is positively associated with the nursing home quality measures. But, the direction of coefficients in two predictors is not consistent. While a certified number of beds is positively associated with the urinary tract infections quality measure, it is negatively associated with the pressure sores quality measure. It seems that the results may be associated with the excess demand of residents to nursing home services provided. With respect to urinary tract infections, such excess demand is relatively larger than other nursing home services; therefore the number of beds may be positively associated with service quality because nursing homes try to promptly respond to demands in order to provide better service for residents.

As expected, occupancy rate has a positive influence on nursing home quality measured by pressure sores and incontinence. It has a positive effect on service quality by decreasing residents with pressure sores by .015 % and residents with incontinence by .022 %. The results are statistically significant at the .01 level. The occupancy rate, however, has a negative influence on the urinary tract infections quality measure. Rather, an increase in occupancy rate increases the percentage of residents with urinary tract infections. The occupancy rate may be negatively associated with nursing home quality if a nursing home does not provide sufficient staff and facilities to care for residents.

Among resident characteristics, the proportion of Medicaid residents is statistically significant at the .01 level for all three quality measures. But, the direction of coefficients is mixed. While the proportion of Medicaid residents has a positive effect on service quality by reducing the proportion of residents with pressure sores and urinary tract infections, it has a negative effect on the bladder or bowel incontinence quality measure. The results do not support previous research findings. Recently, Grabowski (2001) argues that previous studies on the effect of Medicaid on nursing home quality did

not reflect a decrease in excess demand of nursing home bed supply, and the studies did not accurately measure quality by depending on input-based measures such as nursing staffs. Thus, he employs pressure sores as an outcome-oriented measure of quality and finds a different research result. That is, an increase in Medicaid reimbursement decreases the likelihood of pressure sores. With a more direct measure of quality, his study shows a positive influence of Medicaid reimbursement on nursing home quality. In this study, although I do not measure Medicaid as a Medicaid reimbursement rate, the Medicaid still shows a similar positive result on service quality measured by pressure sores when it is measured by the proportion of Medicaid residents. But, in bladder or bowel incontinence, the higher proportion of Medicaid residents is negatively associated with service quality.

As expected, the percentage of residents who do not eat by themselves is negatively associated with nursing home quality. It is statistically significant at the .01 level for pressure sores and bladder or bowel incontinence quality measures. Coefficients indicate that a 1 % increase in residents who do not eat by themselves increases residents with pressure sores by .08 % and residents with incontinence by .18 %. It seems that the increase in residents who do not eat by themselves needs a higher level of assistance and then such a level of assistance results in lower nursing home quality.

5.3.2 Results and Analysis of Process Factors

As expected, nursing care deficiencies and physical restraints have a negative effect on nursing home quality. In other words, the larger number of nursing care deficiencies and the higher proportion of residents with physical restraints are associated with lower service quality. While the nursing care deficiencies are statistically significant at the .01 level for pressure sores and incontinence quality measures, the percentage of physical restraints is statistically significant at the .01 level for the pressure sores and urinary tract infections quality measures. Coefficients indicate that a 1 unit increase in the number of nursing care deficiencies results in a .05 % increase of residents with pressure sores, and a 1 % increase in the residents with physical restraints results in a .02 % increase of residents with urinary tract infections.

When we consider that deficiencies mean failures to meet one or more federal or state requirements, inadequate nursing care leads to poor service quality (Wan 2003;

Wan, Zhang, and Unruh 2006). A negative effect of physical restraints on service quality means that immobility resulting from the use of the physical restraints increases the risk of pressure sores, incontinence, and urinary tract infections. Thus, a higher proportion of residents with physical restraints is associated with a potential negative consequence for resident health (Zinn 1993).

5.3.3 Results and Analysis of Environmental Factors

Environmental factors, such as market competition, population over the age of 65, and median income, show mixed results on nursing home quality. The market competition as a key variable among the environmental factors has mixed findings on nursing home quality. While market competition has a positive effect on the bladder or bowel incontinence quality measure, it has a negative effect on the pressure sores quality measure. In other words, market competition has a positive effect on service quality by decreasing the proportion of residents receiving the incontinence service, whereas its effect on the pressure sores service is negative by increasing the proportion of residents receiving the service. These different results imply that service quality is not necessarily higher in a more competitive market, and such a market competition exhibits a considerable variation by service types provided. In a nursing home service in which market concentration does not accompany supplier power, such a concentrated market may be effective in service quality (Zinn 1994).

Population over the age of 65 is also statistically significant at the .01 level for the pressure sores and bladder or bowel incontinence quality measures. But, it does not have a statistical significance on the urinary tract infections quality measure. Coefficients indicate that a 1 % increase in the population over the age of 65 decreases residents with pressure sores by .12 % and residents with bladder or bowel incontinence by .16 %. The reason that the population over the age of 65 does not have a statistical significance on the urinary tract infections quality measure is that a major target group for treatment of urinary tract infections is not necessarily the elderly population. In fact, many male and female residents under 65 years old also suffer from urinary tract infections.

Median income has a consistent positive effect on three quality measures, such as pressure sores, bladder or bowel incontinence, and urinary tract infections, although its coefficients are relatively small. This result supports previous research findings (Cohen

and Spector 1996; Spector, Selden, and Cohen 1998; Zinn, Aaronson, and Rosko 1993). It may be interpreted that nursing homes located in more affluent counties may be forced to compete on the basis of quality to admit high income residents and thus this competition results in the provision of a higher service quality. Table 5.5 below displays expected and actual results between variables and hypotheses.

Table 5.5 Summary of Expected and Actual Results between Variables and Hypotheses

Independent Variables	Dependent Variable	Expected Direction	Expected Coefficient Direction	Actual Result
H1-1: RN Hours per Resident Day	Service Quality	+ (HQ)	- (HQ)	LQ
H1-2: LPN Hours per Resident Day	Service Quality	+ (HQ)	- (HQ)	LQ
H1-3: NA Hours per Resident Day	Service Quality	- (LQ)	+ (LQ)	mixed
H2: Nursing Director Hours	Service Quality	+ (HQ)	- (HQ)	mixed
H3: Ownership Type	Service Quality	+ (HQ)	- (HQ)	HQ
H4: Nonprofit Market Share	Service Quality	+ (HQ)	- (HQ)	HQ
H5: Chain- Affiliated Ownership	Service Quality	+ (HQ)	- (HQ)	LQ
H6-1: Number of Beds	Service Quality	- (LQ)	+ (LQ)	mixed
H6-2: Occupancy Rate	Service Quality	+ (HQ)	- (HQ)	mixed
H7-1: % of Medicaid Residents	Service Quality	- (LQ)	+ (LQ)	mixed
H7-2: % of Residents not Eating	Service Quality	- (LQ)	+ (LQ)	LQ
H8: Nursing Care Deficiencies	Service Quality	- (LQ)	+ (LQ)	LQ
H9: % of Physical Restraints	Service Quality	- (LQ)	+ (LQ)	LQ
H10: Market Competition	Service Quality	+ (HQ)	- (HQ)	mixed
H11: Population over the Age of 65	Service Quality	+ (HQ)	- (HQ)	HQ
H12: Median Income	Service Quality	+ (HQ)	- (HQ)	HQ

* negative coefficient- high quality, positive coefficient- low quality, HQ- high quality, and LQ- low quality

Overall, an analysis model of structural, process, and environmental factors provides a useful tool for understanding nursing home quality. Based on this analysis, in

particular, I find that process factors show relatively more consistent statistical results on nursing home quality than structural and environmental factors. Although I analyze the effects of structural, process, and environmental factors on nursing home quality, my analysis model does not fully capture the relative influence of different organizational ownerships on nursing home quality. Next, I analyze the relationship between the organizational ownerships and nursing home quality, mainly focusing on the comparison of relative quality between for-profit and nonprofit nursing homes.

5.4 Comparison and Analysis on the Effects of Three Different Organizational Ownerships on Nursing Home Quality

5.4.1 Comparison and Analysis of Structural Factors

Tables 5.7, 5.8, and 5.9 display separate OLS regression results by for-profit, nonprofit, and government-owned nursing homes on three quality measures such as pressure sores, bladder or bowel incontinence, and urinary tract infections. The R^2 of the models ranges from .03 to .35. Nurse staffing levels of nonprofit and for-profit nursing homes have a more consistent statistical significance than government-owned nursing homes on three nursing home quality measures. To be sure, government-owned nursing homes, at least, in nurse staffing levels, are inferior to for-profit and nonprofit nursing homes. The regression results show that RN and LPN hours have a stronger influence on nursing home quality than NA hours. The results suggest that professional nursing staffs, such as RNs and LPNs, play an important role in improving nursing home quality.

Like a pooled analysis model, however, the direction of coefficients in RN and LPN hours per resident day is opposite to my expectation. The coefficients indicate that these RN and LPN hours are negatively associated with nursing home quality. In particular, nonprofit nursing homes have higher coefficients than for-profit nursing homes on pressure sores and incontinence quality measures. As I explained in the pooled model, it seems that nurse staffing levels have a positive influence in their initial units, but the influence of the nursing staff hours does not increase, even if a staffing unit is added after some threshold. Thus, I examine scatterplots to identify the possibility of any nonlinearity between nurse staffing levels and nursing home quality. Like a pooled analysis model, the scatterplots show there is a nonlinear relationship between RN, LPN

hours and the nursing home quality. The relationship shapes a convex curve indicating a negative coefficient. Thus, I run OLS regression models that include nursing staff hours squared. As a result, the regression models present that RN and LPN hours squared have a positive effect on all nursing home quality measures, except for squared RN hours for the incontinence quality measure in nonprofit nursing homes. The results imply that these RN and LPN hours increase nursing home quality, but their positive influence decreases after some thresholds are achieved.

To calculate a specific threshold of RN hours for the pressure sores quality measure in nonprofit nursing homes, I employ a curvilinear model with the equation below:

$$Y = b_0 + b_1X_1 + b_2X_1^2$$

Y = pressure sores

b_0 = intercept

b_1X_1 = linear effect of RN hours

$b_2X_1^2$ = curvilinear effect of RN hours

$$\frac{dy}{dx_1} = b_1 + 2b_2X_1 = 0$$

$$2b_2X_1 = -b_1$$

$$X_1 = -\frac{b_1}{2b_2}$$

If $b_1 = 3.63$ and $b_2 = -.23$

$$X_1 = -\frac{3.63}{2(-.23)} = 7.89$$

This equation means that RN hours decrease the proportion of residents with pressure sores up through 7.89 hours, but the RN hours do not decrease the residents after 7.89 hours. Harrington et al. (2000) suggest minimum nursing times for nurse staffing levels proposed by experts. The proposed time for Registered Nurses (RNs) is 1.15 hr (69 minutes), Licensed Practical Nurses (LPNs) are .70 hr (42 minutes), and Nursing Assistants (NAs) are 2.70 hr (162 minutes). Based on the sample used in this study, while average LPN hours of for-profit, nonprofit, and government-owned nursing homes meet the proposed time, average RN and NA hours of these three organizational ownerships do not satisfy the proposed minimum times.[13] Considering that adopting these minimum standards may have a significant impact on improving service quality, they may have the potential to be an important criterion for a positive effect of nurse staffing levels on nursing home quality.

An interesting finding in nursing director hours is that they have a positive effect on nursing home quality only in for-profit nursing homes. The nursing home director hours are not statistically significant for quality measures in nonprofit and government-owned nursing homes. The hours are only statistically significant at the .10 level for the urinary tract infections quality measure in nonprofit nursing homes. Coefficients in for-profit nursing homes indicate that one unit increase in nursing director hours decreases residents with pressure sores by .25 % and residents with urinary tract infections by .30 %. The results imply that nursing director hours in the for-profit nursing homes have a stronger positive influence on service quality than nonprofit and government-owned nursing homes.

Chain-affiliated nursing homes do not have a consistent statistical significance on nursing home quality in the three different organizational ownerships. While nonprofit chain-affiliated nursing homes are statistically significant at the .10 level for pressure sores quality measure and at the .01 level for bladder or bowel incontinence quality measure, for-profit chain-affiliated nursing homes are statistically significant at the .01

[13]) Average RN, LPN, and LA hours of for-profit, nonprofit, and government-owned nursing homes used in this study are as follows; RNs-- .51 hr, LPNs-- .74 hr, and NAs-- 2.26 hr for for-profit nursing homes, RN-- .68 hr, LPNs-- .75 hr, and NAs-- 2.51 hr for nonprofit nursing homes, and RN-- .71 hr, LPNs-- .77 hr, and NAs-- 2.64 hr for government-owned nursing homes.

level for bladder or bowel incontinence and urinary tract infections quality measures. On the other hand, government-owned nursing homes are not statistically significant for all three quality measures.

Contrary to my expectation, the chain-affiliated ownership, however, is negatively associated with service quality measures in both for-profits and nonprofits. To be sure, chain-affiliated nursing homes do not contribute to improvement of service quality in both organizations. It seems that they have more advantages in cost savings than service quality. It is interesting that the nonprofit chain ownership has a stronger negative effect on quality measures than for-profit chain ownership. But, previous studies that used cost as a dependent variable found that for-profit chain ownership spends less than their nonprofit counterparts (Luksetich, Edwards, and Carroll 2000; McKay 1991). To be sure, the logic of efficiency seems to have a greater appeal to for-profit nursing homes than to nonprofit nursing homes (Aaronson, Zinn, and Rosko 1994; Koetting 1980).

The certified number of beds has a relatively consistent statistical significance on nursing home quality measures in all three different organizational ownerships. While for-profits are statistically significant at the .01 level for the pressure sores quality measure and at the .05 level for the urinary tract infections quality measure, nonprofits are statistically significant at the .01 level for the pressure sores quality measure and at the .05 level for the incontinence quality measure. Government-owned nursing homes are also statistically significant at the .05 level for the incontinence quality measure and at the .01 level for the urinary tract infections quality measure. The direction of coefficients, however, is mixed in the three different organizational ownerships. While number of beds has a negative effect on the pressure sores and bladder or bowel incontinence quality measures, it has a positive effect on the urinary tract infections quality measure. The number of beds has a slightly negative effect on pressure sores in for-profit nursing homes than nonprofit nursing homes. While a 1 unit increase in the number of beds in for-profit nursing homes increases residents with pressure sores by .007 %, for example, a 1 unit increase in the number of beds in nonprofit nursing homes increases residents with pressure sores by .005 %.

Like the number of beds, occupancy rate also does not have consistent statistical significance and coefficient directions on nursing home quality measures in all three

different organizational ownerships. As expected, occupancy rate has a relatively positive effect on nursing home quality measures in both for-profit and nonprofit nursing homes. The nonprofits have a stronger effect than the for-profits. While nonprofit nursing homes have a positive effect on the pressure sores quality measure by decreasing the proportion of residents with pressure sores by .04 %, for-profit nursing homes have a positive effect by decreasing residents with the pressure sores by .01 %. On the other hand, although occupancy rate is statistically significant at the .01 level for the urinary tract infections quality measure in for-profit nursing homes, it has a negative effect on the service quality by increasing the proportion of residents with urinary tract infections by .02 %. Government-owned nursing homes have a positive effect only on the bladder or bowel incontinence quality measure. Considering that the number of beds and occupancy rate do not show consistent statistical significances and coefficient directions on quality measures, it is difficult to conclude that size is a good predictor to show a clear difference in service quality between for-profit and nonprofit nursing homes.

The proportion of Medicaid residents is statistically significant at .01 level for all three quality measures in for-profit nursing homes, while nonprofit nursing homes have a statistical significance on two quality measures of bladder or bowel incontinence and urinary tract infections. But, government-owned nursing homes are not statistically significant on the three quality measures. Past empirical studies found that for-profit nursing homes had the higher proportion of Medicaid residents than nonprofit nursing homes, and it resulted in a more negative effect on service quality. But, my research finds that the higher proportion of Medicaid residents is not always negatively associated with service quality, and for-profit nursing homes do not provide a lower service quality than nonprofit nursing homes. While a 1 % increase in Medicaid residents in the for-profit nursing homes, for instance, decreases residents with urinary tract infections by .04 %, a 1 % increase in Medicaid residents in the nonprofit nursing homes decreases those with the urinary tract infections by .01 %. The results require more systematic studies on the relationship between organizational ownership and Medicaid residents on service quality.

The percentage of residents who do not eat by themselves is negatively associated with pressure sores and incontinence quality measures in both for-profit and nonprofit

nursing homes. The variable is statistically significant at the .01 level for two quality measures. Coefficients indicate that for-profit nursing homes have a more negative effect on pressure sores than nonprofit nursing homes, whereas nonprofit nursing homes have a more negative effect on incontinence than for-profit nursing homes. These different results mean that there is no clear difference between both nursing homes in the residents who do not eat by themselves.

I also examine the effect of church-related nonprofit nursing homes on nursing home quality. As a result, the church-related nonprofit nursing homes are not significantly different from their non-church-related counterparts in all three quality measures. This result supports previous research that there are no significant differences between faith-based organizations and their secular counterparts in providing services, although it does not examine a specific nursing home service (Kearns, Park, and Yankoski 2005). Recognizing that faith-based organizations pursue their mission by fully expressing their faith in the way they deliver services, the result is somewhat counterintuitive.

5.4.2 Comparison and Analysis of Process Factors

Using nursing care deficiencies and physical restraints as process factors does not show a consistent statistical significance on quality measures in the three different organizational ownerships. An interesting finding is that the physical restraints in nonprofit nursing homes have a more negative effect on the urinary tract infections quality measure than those in for-profit nursing homes. While a 1 % increase in residents confined by the physical restraints in nonprofit nursing homes results in .03 % increase of residents with urinary tract infections, for instance, a 1 % increase in those confined by the physical restraints in for-profit nursing homes results in .01 % increase of those with the urinary tract infections.

On the other hand, nursing care deficiencies mostly have a negative impact on quality measures in the three different organizational ownerships, although they do not have a consistent statistical significance on all three quality measures. Like physical restraints, nursing care deficiencies in nonprofit nursing homes have a more negative effect on the pressure sores quality measure than those in for-profit nursing homes. While a 1 unit increase in the number of nursing care deficiencies in for-profit nursing

homes increases residents with pressure sores by .05 %, a 1 unit increase in the number of nursing care deficiencies in nonprofit nursing homes increases those with the pressure sores by .08 %. These similar results in physical restraints and nursing care deficiencies imply that process factors have a more negative effect on service quality in nonprofit nursing homes than in for-profit nursing homes.

5.4.3 Comparison and Analysis of Environmental Factors

Market competition as a key variable among environmental factors is more statistically significant on nonprofit nursing homes than for-profit nursing homes, although it does not have a consistent coefficient direction. The market competition in government-owned nursing homes has a positive effect on only urinary tract infections. An interesting finding is that market competition seems to have mixed effects by different service types in different organizational ownerships. While market competition has a stronger negative effect on nonprofit nursing homes than for-profit nursing homes for the pressure sores quality measure, it has a stronger positive effect on nonprofit nursing homes than for-profit nursing homes for the bladder or bowel incontinence quality measure. In particular, market competition in nonprofit nursing homes has a positive effect on service quality by decreasing residents with incontinence by 1.17 %. These results are somewhat unexpected. In fact, I expected that a high market competition would encourage for-profit nursing homes to improve service quality by driving their profit motive than nonprofit nursing homes (Rice 1998).[14] Based on these different research findings, however, market competition is not always positively associated with a specific organizational ownership on nursing home quality. Thus, it is important to acknowledge that the influence of market competition may vary by different organizational ownerships and different service types provided.

Population over the age of 65 has a positive effect on pressure sores and bladder or bowel incontinence quality measures in for-profit, nonprofit, and government-owned nursing homes, except for the pressure sores quality measure in government-owned nursing homes. As a result, it has a slightly stronger effect on quality measures in

[14]) I visited a for-profit nursing home (Center Pointe Health & Rehabilitation) located in the City of Tallahassee in Florida to interview the executive director. The director told me that for-profit nursing homes more sensitively respond to competition than nonprofit nursing homes.

nonprofit nursing homes than for-profit nursing homes. But, population over the age of 65 does not have a statistical significance on the urinary tract infections quality measure in the three different organizational ownerships. Considering that a target group who needs treatment of urinary tract infections is not necessarily an elderly population over the age of 65, as mentioned earlier, it is not surprising that the elderly population does not have a statistical significance on the urinary tract infections quality measure.

Median income is consistently significant at the .01 level for the pressure sores and incontinence quality measures in both for-profit and nonprofit nursing homes. But, it does not have a statistical significance on the urinary tract infections quality measure in the three different organizational ownerships. The effect of the median income is slightly stronger in nonprofit nursing homes than in for-profit nursing homes for the pressure sores quality measure, although the difference of coefficients is very small. This result supports a previous research finding (Spector, Selden, and Cohen 1998). Based on the research finding of this study, nonprofit nursing homes located in a county in which residents with a higher income live seem to provide a higher service quality than for-profit nursing homes.

Table 5.6 Determinants of Nursing Home Quality

Independent Variables	Pressure Sores	Incontinence	Urinary Tract Infections
Structural Factors			
Nursing Staff			
RN Hours per Resident Day	2.861***	2.765***	1.907***
	(.240)	(.290)	(.300)
Squared RN Hours	-.239***	-.038	-.318***
	(.059)	(.071)	(.089)
LPN Hours per Resident Day	2.528***	3.019***	3.047***
	(.183)	(.222)	(.261)
Squared LPN Hours	-.270***	-.186***	-.439***
	(.032)	(.038)	(.066)
NA Hours per Resident Day	-.507***	-.628*	.395**
	(.118)	(.143)	(.135)
Squared NA Hours	.014	.019*	-.033***
	(.010)	(.012)	(.011)
Nursing Director Hours	-.255**	-.203	-.112
	(.109)	(.132)	(.120)
Organizational Ownership			
Ownership Type	-.423***	.091	-.574***
	(.125)	(.136)	(.140)
Nonprofit Market Share	-.001	-.013***	-.009***
	(.002)	(.003)	(.003)
Chain-Affiliated Ownership	.137	.488***	.403***
	(.092)	(.112)	(.103)
Size			
Certified Number of Beds	.006***	-.001	-.002**
	(.001)	(.001)	(.001)
Occupancy Rate	-.015***	-.022***	.020***
	(.004)	(.004)	(.004)

Table 5.6 Continued

Resident Characteristics			
% of Medicaid Residents	-.027***	.018***	-.034***
	(.003)	(.003)	(.003)
% of Residents Who do not Eat by Themselves	.079***	.181***	.001
	(.005)	(.006)	(.005)
Process Factors			
Number of Deficiencies	.053***	.024***	-.007
	(.007)	(.008)	(.007)
% of Physical Restraints	.021***	.008	.017***
	(.005)	(.006)	(.006)
Environmental Factors			
Market Competition	.763***	-.715***	-.329
	(.215)	(.260)	(.240)
Population over the Age of 65	-.122***	-.161***	.024
	(.013)	(.016)	(.014)
Median Income	-.00004***	-.00009***	-.00001*
	(.000)	(.000)	(.000)
Constant	8.453***	5.823***	6.666***
	(.602)	(.729)	(.696)
R Squared	.11	.19	.04
F	74.444***	145.790***	26.071***
Number of Cases	12073	12073	11263

Notes: Coefficients are ordinary least squares regression coefficients. Standard errors are in parentheses. Dependent variables are the percentage of residents with pressure sores, bladder or bowel incontinence, and urinary tract infections. *** P ≤ .01, ** P ≤ .05, * P ≤ .10.

Table 5.7 Comparison of Determinants by Ownership Types on Nursing Home Quality- Pressure Sores

Independent Variables	For-Profits	Nonprofits	Governments
Structural Factors			
Nursing Staff			
RN Hours per Resident Day	2.524***	3.629***	-.504
	(.298)	(.416)	(1.089)
Squared RN Hours	-.351***	-.229**	.476*
	(.077)	(.097)	(.248)
LPN Hours per Resident Day	2.908***	2.822***	2.151*
	(.261)	(.325)	(1.240)
Squared LPN Hours	-.466***	-.233***	-.243
	(.061)	(.041)	(.390)
NA Hours per Resident Day	-.391***	-.892***	-.276
	(.134)	(.278)	(.741)
Squared NA Hours	.009	.033	-.021
	(.010)	(.027)	(.088)
Nursing Director Hours	-.253**	-.223	.098
	(.124)	(.221)	(.233)
Organizational Ownership			
Nonprofit Market Share	-.002	___	___
	(.003)		
Chain-Affiliated Ownership	.057	.357*	1.263
	(.106)	(.186)	(.871)
Church-Related Ownership	___	-.222	___
		(.326)	
Size			
Certified Number of Beds	.007***	.005***	.002
	(.001)	(.001)	(.002)
Occupancy Rate	-.010**	-.035***	-.010
	(.004)	(.008)	(.018)

Table 5.7 Continued

Resident Characteristics			
% of Medicaid Residents	-.034***	-.011**	-.011
	(.003)	(.005)	(.013)
% of Residents Who do not Eat by Themselves	.083***	.067***	.036
	(.005)	(.009)	(.023)
Process Factors			
Number of Deficiencies	.045***	.078***	.037
	(.007)	(.014)	(.034)
% of Physical Restraints	.027***	-.005	.027
	(.006)	(.012)	(.025)
Environmental Factors			
Market Competition	.724***	.991**	-.162
	(.255)	(.425)	(.730)
Population over the Age of 65	-.117***	-.131***	-.100
	(.015)	(.026)	(.066)
Median Income	-.00002***	-.00007***	-.0000
	(.000)	(.000)	(.000)
Constant	7.577***	10.042***	7.553**
	(.697)	(1.279)	(2.919)
R Squared	.09	.16	.08
F	49.636***	33.909***	2.833***
Number of Cases	8860	3212	577

Notes: Coefficients are ordinary least squares regression coefficients. Standard errors are in parentheses. Dependent variable is the percentage of residents with pressure sores. *** P ≤ .01, ** P ≤ .05, * P ≤ .10.

Table 5.8 Comparison of Determinants by Ownership Types on Nursing Home Quality- Bladder or Bowel Incontinence

Independent Variables	For-Profits	Nonprofits	Governments
Structural Factors			
Nursing Staff			
RN Hours per Resident Day	2.772***	2.839***	.090
	(.372)	(.464)	(1.140)
Squared RN Hours	-.366***	.181*	.152
	(.096)	(.108)	(.260)
LPN Hours per Resident Day	3.341***	3.784***	-1.889
	(.325)	(.363)	(1.298)
Squared LPN Hours	-.409***	-.161***	2.432***
	(.077)	(.046)	(.409)
NA Hours per Resident Day	-.513***	-.972***	3.345***
	(.165)	(.311)	(.776)
Squared NA Hours	-.013	.042	-.634***
	(.013)	(.030)	(.092)
Nursing Director Hours	-.190	-.141	.235
	(.155)	(.246)	(.244)
Organizational Ownership			
Nonprofit Market Share	-.010**	___	___
	(.004)		
Chain-Affiliated Ownership	.447***	.699***	-.008
	(.132)	(.208)	(.911)
Church-Related Ownership	___	-.330	___
		(.251)	
Size			
Certified Number of Beds	.001	-.003**	.005**
	(.001)	(.002)	(.002)

Table 5.8 Continued

Occupancy Rate	-.020***	-.016*	-.049**
	(.005)	(.009)	(.019)
Resident Characteristics			
% of Medicaid Residents	.027***	.001	-.005
	(.004)	(.006)	(.013)
% of Residents Who do	.173***	.210***	176***
not Eat by Themselves	(.007)	(.010)	(.024)
Process Factors			
Number of Deficiencies	.021**	.026	-.059*
	(.009)	(.016)	(.035)
% of Physical Restraints	.035	.008	.063**
	(.007)	(.013)	(.026)
Environmental Factors			
Market Competition	-.371	-1.162**	.229
	(.319)	(.474)	(.764)
Population over the Age of 65	-.157***	-.161***	-.190***
	(.019)	(.029)	(.069)
Median Income	.00009***	-.00009***	.000***
	(.000)	(.000)	(.006)
Constant	4.268***	5.570***	6.101**
	(.869)	(1.428)	(3.055)
R Squared	.15	.29	.35
F	88.721***	73.873***	17.660***
Number of Cases	8860	3212	577

Notes: Coefficients are ordinary least squares regression coefficients. Standard errors are in parentheses. Dependent variable is the percentage of residents with bladder or bowel incontinence. *** P ≤ .01, ** P ≤ .05, * P ≤ .10.

Table 5.9 Comparison of Determinants by Ownership Types on Nursing Home Quality- Urinary Tract Infections

Independent Variables	For-Profits	Nonprofits	Governments
Structural Factors			
Nursing Staff			
RN Hours per Resident Day	2.264***	2.137**	3.652
	(.354)	(.919)	(2.568)
Squared RN Hours	-.338***	-.850*	-1.904
	(.093)	(.497)	(1.379)
LPN Hours per Resident Day	2.959***	4.055***	5.898***
	(.304)	(.769)	(1.552)
Squared LPN Hours	-.423***	-.935**	-1.775***
	(.071)	(.369)	(.584)
NA Hours per Resident Day	.333**	1.394**	-2.780***
	(.154)	(.542)	(.862)
Squared NA Hours	-.029**	-.170*	.350***
	(.012)	(.090)	(.117)
Nursing Director Hours	-.296**	.397*	.219
	(.141)	(.226)	(.222)
Organizational Ownership			
Nonprofit Market Share	-.011***	___	___
	(.004)		
Chain-Affiliated Ownership	.413***	.272	-.411
	(.122)	(.193)	(.886)
Church-Related Ownership	___	.275	___
		(.238)	
Size			
Certified Number of Beds	-.003**	-.002	-.006***
	(.001)	(.001)	(.002)

Table 5.9 Continued

Occupancy Rate	.020***	.008	.020
	(.005)	(.009)	(.019)
Resident Characteristics			
% of Medicaid Residents	-.044***	-.013**	-.002
	(.004)	(.005)	(.013)
% of Residents Who do not Eat by Themselves	.004	-.003	.008
	(.006)	(.011)	(.025)
Process Factors			
Number of Deficiencies	-.012	.020	.054
	(.008)	(.015)	(.034)
% of Physical Restraints	.014**	.033***	.006
	(.007)	(.012)	(.026)
Environmental Factors			
Market Competition	-.094	-.294	-1.370*
	(.292)	(.445)	(.787)
Population over the Age of 65	.026	-.002	-.006
	(.017)	(.027)	(.069)
Median Income	-.00001	-.00001	.00002
	(.000)	(.000)	(.000)
Constant	7.364***	3.060**	7.265**
	(.816)	(1.505)	(3.080)
R Squared	.05	.03	.07
F	23.964***	5.688***	2.171***
Number of Cases	8370	2892	505

Notes: Coefficients are ordinary least squares regression coefficients. Standard errors are in parentheses. Dependent variable is the percentage of residents with urinary tract infections. *** P ≤ .01, ** P ≤ .05, * P ≤ .10.

5.5 Overall Evaluation-- Effects of Different Organizational Ownerships on Nursing Home Quality

I have compared and analyzed the effects of three different organizational ownerships on nursing home quality. Overall, while process factors have a relatively stronger effect on nursing home quality in for-profit nursing homes than in nonprofit nursing homes, environmental factors have a relatively stronger effect on nursing home quality in nonprofit nursing homes than in for-profit nursing homes. On the other hand, structural factors show mixed effects on nursing home quality in both for-profit and nonprofit nursing homes. To be sure, government-owned nursing homes have a lower service quality than for-profit and nonprofit nursing homes. With estimates of separate regression analyses, it is difficult to judge the superiority of one organizational ownership on the service quality between for-profit and nonprofit nursing homes.

One important aspect is that the effect of organizational ownership on service quality exhibits some variations in the different service types provided. While market competition has a more negative effect on the pressure sores quality measure in nonprofit nursing homes than in for-profit nursing homes, for example, it has a more positive effect on the bladder or bowel incontinence quality measure in nonprofit nursing homes than in for-profit nursing homes. It seems that the results require a systematic study on the effect of different organizational ownerships on nursing home quality measures categorized by some adequate criteria.

5.6 A Linear Structural Equation Model for Nursing Home Quality

A multiple regression model presumes that multiple independent variables influence the same dependent variable(s). This employs a simple causal relationship that expresses only direct effects of a set of variables on a dependent variable. Thus, the multiple regression model does not capture both direct and indirect effects and express complex causal relationships among independent and dependent variables. One advantage of the structural equation model is that it examines a series of causal relationships simultaneously. Variables are presented by latent variables that cannot be measured directly but can be measured by multiple indicators. The multiple indicators

are manifest variables used as the indicators of latent variables. Whether the manifest variables adequately represent a latent variable can be examined by factor analysis.

Recently, some authors suggest that nursing home quality needs to be explained by a structural equation model including direct and indirect relationships among variables (Sainfort, Ramsay, and Monato, Jr. 1995; Unruh and Wan 2004). The authors argue that the structural equation model can provide a fruitful analytical tool for investigating direct and indirect effects of structural and environmental factors on process and quality factors.[15] Thus, this study tests the structural equation model with the SPE framework presented in this study. But, there are some limitations to testing the model with all the variables included in the SPE factors because the measurement units and levels of measurement of the variables are different, and most variables of structural and environmental factors are not grouped by factor analysis. In other words, nurse staffing levels, administrative staff, ownership type, nonprofit market share, chain-affiliated ownership, size, and resident characteristics are not grouped as a structure latent variable. Market competition, population over the age of 65, and median income are also not grouped as an environment latent variable by factor analysis. Thus, these variables cannot be used as manifest variables that represent a latent or a construct variable.

Among the structural factors, only RN and NA hours are used as manifest variables representing a latent variable (nursing staff) by factor analysis. Before the nursing staff directly influences process, it may influence case mix reflecting resident characteristics. I expect that nursing staff will be positively associated with case mix by decreasing the percentage of residents who do not eat, use toilet, and transfer by themselves. I also expect that case mix will be negatively associated with process and then the process will also be negatively associated with service quality by increasing the percentage of residents with pressure sores, bladder or bowel incontinence, and urinary tract infections. Figure 5.1 shows a structural equation model for nursing home quality.

A confirmatory factor analysis is used as a method to test whether multiple manifest variables are used as single indicators of their respective latent variable before a structural equation model is tested (Hair, Anderson, Tatham, and Black 1998). This

[15]) The authors do not provide empirical evidence of the structural equation model in their study.

analysis recognizes that the observed value of each indicator is expected to have a correlation with the true score of the corresponding construct. In this study, four constructs (nursing staff, case mix, process, and service quality) are proposed, and their observed indicators are presented on the basis of theoretical and empirical literature reviews. As a result of the factor analysis, all manifest variables, except for LPN hours, adequately represent their respective latent or construct variable.[16]

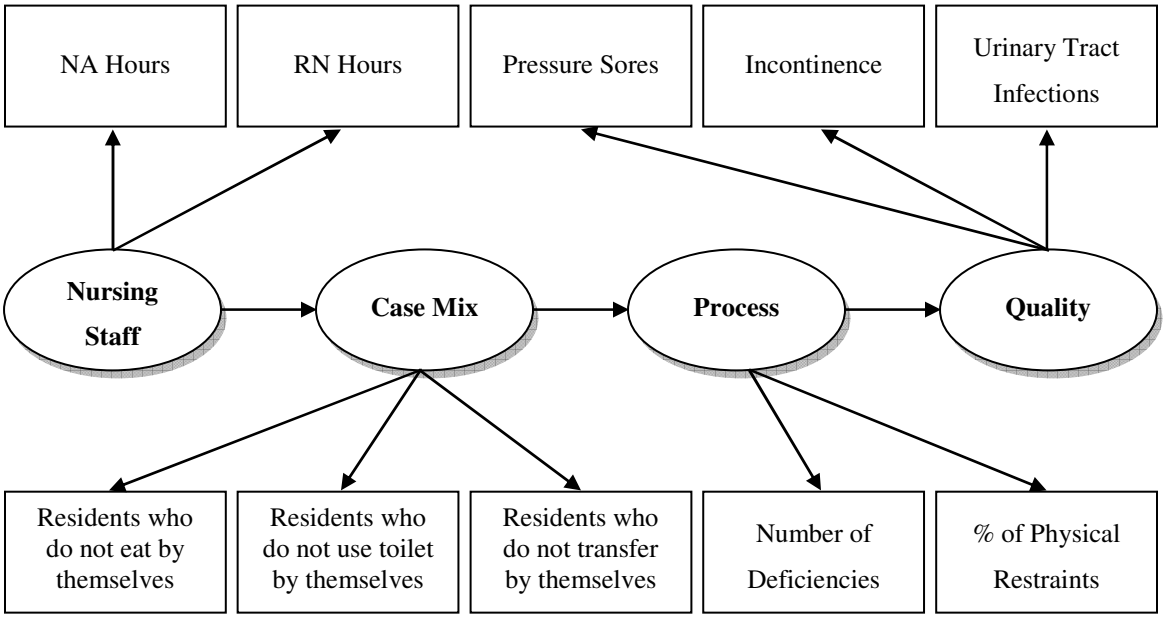

Figure 5.1 A Structural Equation Model for Nursing Home Quality

The overall model fit of the hypothesized structural equation model is tested with three major model fit measures such as absolute fit, comparative fit, and parsimonious fit. Each fit provides goodness-of-fit indices indicating how well the postulated model fits

[16]) All manifest variables are grouped by factor with factor loadings that are .40 above under their respective construct. But, LPN hours as a manifest variable to measure nursing staff are not grouped by factor with a factor loading that is less than .40. Thus, I did not include LPN hours as a manifest variable to measure nursing staff in a final model.

the data. The absolute fit is concerned with the degree to which the overall model predicts the observed covariance or correlation matrix. In the absolute fit, P value (.00) of chi-square is statistically significant, inconsistent with a good model fit. In the obverse of traditional hypothesis testing, a non-significant P value indicates that the model fits data in that the model can reproduce the population covariance matrix (Kelloway 1998). But, this chi-square is sensitive to sample size. In other words, larger samples tend to inflate the chi-square and to decrease the likelihood of achieving a good model fit (James, Mulaik, and Brett 1982). The most critical index in the absolute fit is the root mean square residual (RMR) which is essentially the difference between the original correlation matrix and the correlation matrix implied by the model. The RMR ranges from a lower bound of 0 to an upper bound of 1. The RMR in this structural equation model is 2.23. Considering that values less than .05 are generally interpreted as indicating a good fit to the data, this model does not show a good fit. But, similar to the RMR, the root mean squared error of approximation (RMSEA) based on the analysis of residuals indicates .06. Steiger (1990) suggests that values below .10 indicate a good fit to the data. Another major index is the goodness-of-fit index (GFI). The GFI is based on a ratio of the sum of the squared discrepancies to the observed variances and it ranges from 0 to 1, with values exceeding .90 indicating a good fit to the data (Kelloway 1998). The GFI in this model is .98 and it indicates a good model fit. The adjusted goodness-of-fit index (AGFI) also shows a good model fit by indicating .97 as a value exceeding a good model fit to the data.

Tests of comparative fit deal with whether the model under consideration is better than some competing model. As a major index of the comparative fit, there is a normed fit index (NFI). The NFI ranges from 0 to 1, with values exceeding .90 indicating a good model fit. The NFI in this structural equation model shows a good model fit by indicating .95. As other major indices of the comparative fit, incremental fit index (IFI) and comparative fit index (CFI) indicate a good model fit by showing both .95 value exceeding .90 indicating a good model fit to the data.

Parsimonious fit measures relate the goodness-of-fit of the model to the number of estimated coefficients required to achieve this level of fit (Hair, Anderson, Tatham, and Black 1998, P. 658). The parsimonious normed fit index (PNFI) and the

parsimonious goodness-of-fit index (PGFI) are major indices of the parsimonious fit measures. Both the PNFI and the PGFI range from 0 to 1, with higher values indicating a more parsimonious fit. There is no absolute standard to evaluate 'high' index. In this model, the PNFI is .70 and the PGFI is .59. Table 5.10 presents good fit measures of a structural equation model for nursing home quality.

Table 5.10 Goodness-of-Fit Statistics for a Hypothesized Structural Equation Model of Nursing Home Quality

χ^2	df	P	RMSEA	GFI	AGFI	NFI	IFI	CFI	PNFI	PGFI
1177.10	33	.00	.06	.98	.97	.95	.95	.95	.70	.59

Table 5.11 presents the parameter estimates for the structural equation model expressed as both unstandardized and standardized regression weights. The result of the structural equation model analysis demonstrates that hypothesized paths are statistically significant with the predicted direction, but not for the relationship between nursing staff and case mix. As the case mix increases, as expected, it has a negative effect on the process latent variable. This result implies that the increase of residents who need a high level of special assistance in eating, toilet use, and transferring is negatively associated with the process latent variable represented by nursing care deficiencies and physical restraints. The structural equation model also finds that the increase in the process latent variable is negatively associated with service quality by increasing the percentage of residents with pressure sores, bladder or bowel incontinence, and urinary tract infections (standardized coefficient .76). When interpreting coefficients presented in the structural equation model, it is important to note that case mix, process, and service quality, except for nursing staff, are all negative latent variables. In other words, positive coefficients indicate a negative association between latent variables. For example, a higher increase of process latent variable is associated with lower service quality.

Contrary to my expectation, however, nursing staff has a negative effect on case mix, although it is statistically significant at the .01 level. I expected that an increase in nursing staff decreased the percentage of residents who need a high level of special assistance in the eating, toilet use, and transferring. As seen in the relationship between nursing staff hours and service quality, this result may be interpreted that nursing staff has a positive effect on case mix, but it is no longer positive on the case mix after some minimum staffing thresholds are achieved.

Table 5.11 The Structural Path Estimates for Nursing Home Quality

Latent Variables		Unstandardized Coefficients	Standardized Coefficients
Nursing Staff →	Case Mix	19.84***	.06***
		(2.25)	
Case Mix →	Process	.05***	.71***
		(.01)	
Process →	Service Quality	1.22***	.76***
		(.14)	

Notes: Standard errors are in parentheses. Number of cases is 11343. *** P ≤ .01

5.7 Linear Structural Equation Models by Three Different Organizational Ownerships on Nursing Home Quality

I also test structural equation models for each of the three different organizational ownerships on nursing home quality.[17] Table 5.12 displays goodness-of-fit statistics for hypothesized structural equation models by for-profit, nonprofit, and government ownerships. Overall, good fit indices of the structural equation models by the three

[17]) In structural equation models in nonprofits and governments, urinary tract infections as a manifest variable to measure service quality was removed because it was not grouped into the same factors by factor analysis. In the structural equation model in governments, on the other hand, LPN hours as a manifest variable to measure nursing staff was included because the LPN hours were grouped into the same factors by factor analysis.

organizational ownerships indicate good fits, except for χ^2 and RMR. GFI and AGFI of the hypothesized structural equation models by the three different organizational ownerships are as follows: The GFI and AGFI of for-profits are .98 and .97, those of nonprofits are .97 and .94, and those of governments are .95 and .92. These GFI and AGFI values indicate all good model fits. NFI, IFI, and CFI values of for-profits are all .95, those of nonprofits are all .94, and those of governments are .92, 94, and .94. These indices are interpreted as values indicating good fits to the data.

PNFI and PGFI as parsimonious fit indices indicate values of an acceptable level at each of the three organizational ownerships. Unlike the other fit indices, the PNFI and PGFI are no absolute standard for high index. The PNFI and PGFI of for-profits are .70 and .59, those of nonprofits are .65 and .54, and those of governments are .67 and .57. The values of the for-profits are somewhat higher than those of the nonprofits and government. Overall, good model fit indices of for-profits have slightly higher values than those of nonprofits and governments, although there are no significant differences among their indices. In short, the for-profits provide the best model fit among the three organizational ownerships.

Table 5.12 Goodness-of-Fit Statistics for Hypothesized Structural Equation Models by Three Different Organizational Ownerships on Nursing Home Quality

	χ^2	df	P	RMSEA	GFI	AGFI	NFI	IFI	CFI	PNFI	PGFI
For-Profits	836.06	33	.00	.05	.98	.97	.95	.95	.95	.70	.59
Nonprofits	457.74	25	.00	.08	.97	.94	.94	.94	.94	.65	.54
Governments	136.01	33	.00	.08	.95	.92	.92	.94	.94	.67	.57

Table 5.13 presents the parameter estimates for structural equation models by the three different organizational ownerships expressed as both unstandardized and standardized regression weights. The results of the structural equation models show that hypothesized paths by these organizational ownerships are statistically significant at the

.01 level with predicted directions, but not for the relationship between nursing staff and case mix. In the relationship between case mix and process, governments indicate the highest standardized coefficient (.79) among the three organizational ownerships (for-profits-- .71 and nonprofits-- .78). Considering that the process is a negative latent variable, the case mix has the strongest negative effect on the process in government-owned nursing homes. In the relationship between process and service quality, governments also indicate the highest standardized coefficient (.87) among the three organizational ownerships. Next is nonprofits (standardized coefficient .76), and for-profits indicate the lowest standardized coefficient (.75). Considering that service quality is a negative latent variable, a higher coefficient means lower service quality. As a result, the process is associated with the lowest service quality in the government-owned nursing homes.

Table 5.13 The Structural Path Estimates by Three Different Organizational Ownerships on Nursing Home Quality

Latent Variables	Unstandardized Coefficients				Standardized Coefficients	
	For-Profits (N= 8412)		Nonprofits (N= 2931)		Governments (N=516)	
Nursing Staff ⟶ Case Mix	31.49***	.06***	14.32***	.15***	14.99***	.17***
	(3.99)		(2.80)		(4.75)	
Case Mix ⟶ Process	.05***	.71***	.05***	.78***	.08***	.79***
	(.01)		(.01)		(.03)	
Process ⟶ Service Quality	1.37***	.75***	2.29***	.76***	1.79***	.87***
	(.21)		(.42)		(.59)	

Notes: Standard errors are in parentheses. *** P ≤ .01

CHAPTER 6
DISCUSSION AND CONCLUSIONS

6.1 Review of This Study

The objective of this study was to explore a theoretical framework for understanding nursing home quality and to test empirically the effect of organizational ownership on nursing home quality. The existing empirical literature on the effect of ownership type on nursing home quality has suffered from lack of a theoretical framework and a systematic comparison in their relationship. This study proposes a structure, process, and environment (SPE) one as a theoretical framework for explaining nursing home quality and attempts to examine the relationship between different organizational ownerships, such as for-profits, nonprofits, and governments, and service quality, focusing on the comparison of the for-profits and the nonprofits.

In order to conduct this study, I obtained a national data set about nursing homes across fifty states in the United States from the Online Survey Certification Reporting (OSCAR) system database, the Minimum Data Set (MDS) repository, and Centers for Medicare & Medicaid Services (CMS). The data for this study were collected during the time period of January 2004 through June 2005, and 13,611 nursing homes were finally used for analysis after the data were cleaned. Of the 13,611 nursing homes, for-profits (9490 nursing homes) account for 69.7 % of the sample, nonprofits (3480 nursing homes) account for 25.6 % of the sample, and government-owned (641 nursing homes) account for 4.7 % of the sample.

Based on theoretical knowledge of organizational ownership and literature reviews on the relationships between ownership type and nursing home quality, I set up 16 hypotheses and tested them with multiple regression models and structural equation models. As seen in table 5.5, seven hypotheses were supported, three hypotheses were

rejected, and six hypotheses were mixed. In the structural equation model analysis that examines causal relationships among variables, I find there are partial causal relationships among some variables in an overall structural equation model for nursing home quality. The results of major findings in this study are summarized below.

First, it seems that there is a nonlinear association between RN and LPN hours and nursing home quality.[18] In other words, these nursing staff hours have a positive effect on service quality until a certain point where they actually begin to have a negative effect with additional nursing staff hours.

Second, nonprofit nursing homes provide a higher service quality than for-profit nursing homes. But, the former does not have a consistent superiority to the latter in all structural, process, and environmental factors in separate regression models by organizational ownerships.

Third, an increase in nonprofit market share leads to improve both for-profit and overall nursing home quality.

Fourth, chain-affiliated ownership has a negative effect on nursing home quality. Its effect seems more negative in nonprofit chain nursing homes than for-profit chain nursing homes.

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[18]) The nonlinear relationships between RN or LPN hours and nursing home quality may be affected by another independent variable. Considering that case mix may change the form of the relationship between the RN or LPN hours and nursing home quality, one need to examine an interaction effect between the RN or LPN hours and the case mix. The interaction term is a compound variable formed by multiplying X_1 by the interacted variable X_2 (Hair, Jr., Anderson, Tatham, and Black 1998, 171). To determine whether the interaction term is significant, I estimate the original equation and then estimate the interacted relationship. As a result, I do not find that there are consistent effects of the interaction term between RN or LPN hours and case mix on three nursing home quality measures. The interaction effect is presented in only the incontinence quality measure. Without an interaction term between RN hours and case mix, for example, the RN hours have a negative effect on the incontinence quality measure by increasing 1.96 % residents with incontinence. By adding the interaction term, however, the RN hours have a positive effect on the incontinence quality measure by decreasing .89 % residents with it. That is, the relationship between the RN hours and the incontinence quality measure changes, depending the interaction term. In short, the interaction effect between RN or LPN hours and nursing home quality provides a partial support by different quality measures.

Fifth, organizational size measured by number of beds and occupancy rate has mixed results on nursing home quality.

Sixth, the proportion of Medicaid residents is not necessarily negatively associated with nursing home quality. The proportion of the Medicaid residents has a positive effect on pressure sores and urinary tract infections quality measures. Unlike my expectation, it has a more positive effect on the service quality in for-profit nursing homes than in nonprofit nursing homes.

Seventh, process factors measured by number of nursing care deficiencies and percentage of residents with physical restraints have a negative effect on nursing home quality.

Eighth, market competition shows mixed findings on nursing home quality. It is not always positively associated with better quality.

Ninth, population over the age of 65 in the county of the nursing homes has a positive effect on nursing home quality.

Tenth, median income of residents living in the county of the nursing homes is positively associated with nursing home quality.

In the next part, I demonstrate implications of major findings related to my research questions and discuss some interesting results.

6.2 Implications of Major Findings

The key implications of this study are that the SPE framework provides a useful tool for explaining nursing home quality, and nonprofit nursing homes provide a higher service quality than for-profit nursing homes in a regression analysis measured by a dummy variable. In particular, nonprofit nursing homes have strengths in environmental factors. But, they do not have superiority to for-profit nursing homes in process factors measured by nursing care deficiencies and physical restraints. Considering that these process factors lead to improved service quality through adequate nursing care, effective strategies of nonprofit nursing homes for improving these process factors are required.

Much of the empirical literature has relied solely on a dummy variable to capture the effect of ownership type on nursing home quality. But, such a method does not fully explain the effect of nonprofits, even if it indicates a positive effect of the nonprofits on

nursing home quality. Thus, this study examines the influence of nonprofit nursing homes on for-profit and overall nursing home quality by investigating an increase in the nonprofit market share. As a result, the study finds that the increase in the nonprofit market share has a positive effect on both for-profit and overall nursing home quality. This result implies that a competitive spillover effect from the nonprofits leads to higher quality by encouraging the service improvement of for-profit nursing homes.

This study demonstrates positive and negative aspects of intersectoral competition among different organizational ownerships. While such a competition has a beneficial effect on service quality by facilitating a profit motive of for-profit nursing homes, excessive competition may weaken nonprofits' ability to serve a socially beneficial role in nursing home services. As a result, this study finds that market competition does not always have a positive effect on service quality. It has both positive and negative effects on service quality by the different organizational ownerships and different service types provided. There is no question that market competition is an important factor for improving nursing home quality. But, more important is how the three service providers, such as for-profits, nonprofits, and governments, coexist in the nursing home industry. Their mutual existence helps achieve a better institutional balance among for-profits, nonprofits, and governments (Weisbrod 1988). In this regard, it is important to explore how cooperative relationships, such as public-private partnerships, government-nonprofit collaboration, and network, among service providers improve service quality. Relatively, it seems true that government-owned nursing homes provide a lower quality than for-profit and nonprofit nursing homes. Nevertheless, government still has the accountability of regulation and supervision for providing a high service quality. Thus, it is important to acknowledge how to reestablish the role and function of government within these cooperative relationships.

This study also finds an interesting result in the study of nursing home quality. Unlike my expectation, RN and LPN hours do not have a positive effect on nursing home quality. I expected that a higher level of these nursing staff hours would improve the quality by providing residents with more professional service care. This unexpected result may be interpreted with two reasons. One reason is that there is a marginal point in increasing nursing staff hours to positively influence service quality. In other words, the

continuous increase of RN and LPN hours does not always have a positive effect on improving nursing home quality. As suggested earlier, RN and LPN hours do not have such a positive effect on quality after some thresholds are achieved. Another possible reason is the suspected endogeneity of nursing staff hours and nursing home quality. That is, there may be unobserved factors that influence both the RN, LPN hours and service quality. This problem may be solved by using instrumental variables that are correlated with nursing staff hours and that do not influence the error term.

6.3 Limitations of This Study and Suggestions for Future Study

A key question in this study was whether ownership type matters for service quality. In order to examine the effect of ownership type, I selected a specific service type to compare relative effects of different organizational ownerships, such as for-profits, nonprofits, and governments on the service quality. A nursing home is a service area in which these for-profits, nonprofits, and governments compete with each other to provide better service quality. This study finds that ownership type is significant because different organizational ownerships have different effects on service quality. The study also finds that nonprofits provide a higher quality of nursing home service than for-profits. The result may reflect a recent tendency in which the nonprofit sector has significantly grown as a core service provider in health care service delivery. But, the existence of simple differences between for-profits and nonprofits is neither necessary nor sufficient to conclude that the nonprofit is a better organizational ownership for improving nursing home quality than the for-profit. Further, failure to observe large differences in both organizational ownerships does not mean that the nonprofit sector is not beneficial.

The substantial influence of nonprofits on nursing home quality may be examined by focusing on whether an increase in the nonprofit market share has a positive effect on for-profit and overall nursing home quality. This study finds that an increase in the nonprofit market share leads to higher service quality in for-profit and overall nursing homes. This result may imply that the nonprofit sector plays an important role in service delivery by demonstrating cooperation with another service provider by encouraging the improvement of service quality in for-profits. Furthermore, the fact that relative

influences of determinants by different organizational ownerships on nursing home quality are different facilitates the necessity of such cooperation among them, complementing the weaknesses in each other. Recognizing that there are no empirical studies on cooperation or collaboration among service providers to improve nursing home quality, future research needs to explore how cooperative relationships among the service providers influence nursing home quality.

Certain limitations of this study should be taken into consideration. The study demonstrates the effect of organizational ownership on nursing home quality measured by pressure sores, bladder or bowel incontinence, and urinary tract infections. Although I tried to select adequate and correct quality measures with some criteria, it does not seem that they provide a comprehensive set of quality measures. This difficulty in measuring nursing home quality partly stems from a value-oriented quality concept itself. Although the quality concept has been defined in many different ways, none has clearly captured all elements involved in the concept (Wan and Connell 2003). Nevertheless, considering that the effect of organizational ownership on service quality produces different results by different quality measures, the selection of such comprehensive quality measures by some clear criteria would be necessary to understand fully the relationship between organizational ownership and nursing home quality.[19]

It is inevitable that to examine the effect of organizational ownership on service quality, one must select a specific service type. This study examines the relationship between organizational ownership and quality with a nursing home case. While major findings of the study have certain implications, it does not seem appropriate to apply these findings to all health care services. The nursing home industry may be less relevant for understanding broader trends in the health care sector. This study primarily dealt with the effect of organizational ownership in a nursing home service. But, the findings may differ in service areas such as economic services, social services, and other health care services. Thus, future research needs to explore how the effect of organizational ownership varies in these different service areas.

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[19]) Zimmerman et al. (1995) insist that quality indicators can be best described by looking at their characteristics from three perspectives: 1) resident versus facility level, 2) prevalence versus incidence, and 3) process versus outcome.

Finally, the lack of empirical studies that estimate causal relationships among variables influencing nursing home quality has inhibited our understanding about how structural, process, environmental factors are related to each other. Thus, I used the analysis method of structural equation models to test such causal relationships among variables. But, the structural equation models used in this study do not fully explain how structure and environment are related to either process or quality. In fact, the structural and environmental factors used in this study are not appropriate in testing the structural equation models because their measurement units and levels of measurement are not easily grouped into the same factors by factor analysis. For this reason, I did not include environmental factors and other structural factors, except for nurse staffing levels in a final structural equation analysis. In order to use a structural equation model, it is important to select adequate manifest variables representing a latent or construct variable.

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Professional Experiences

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02/99-07/99	Researcher (Part-Time) The Korea Institute of Public Administration
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Publications

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- Moon, Sin-Yong, Jungryul Kim, Bohak Maeng, and **Jongho Roh** (1999). *A Study on the Anti-Corruption System in Korea* (Seoul, South Korea: The Korea Institute of Public Administration).

Conference Papers and Presentations

- **Roh, Jongho**, "Organizational Form and Service Quality: An Empirical Study on the Effect of For-Profit and Nonprofit Organizations in Evaluating the Quality of Care in Nursing Homes." Presentation at Annual Meeting of ARNOVA, Washington, D.C., November 17-19, 2005.
- **Roh, Jongho**, "Political Control and Bureaucratic Discretion in State Agency Policymaking- A Case of Medicaid Policy Program." Presentation at Annual Meeting of Southern Political Science Association, New Orleans, LA, January 6-8, 2005.
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- Berry, Frances, Myungjung Kwon, and **Jongho Roh**, "State Adoptions and State Lotteries: The Species of States." Presentation at Annual Meeting of Southern Political Science Association, New Orleans, LA, January 8-10, 2004.
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Academic Honors and Awards

- 08/04 ~ 08/06 Graduate Assistantship, Askew School of Public Administration and Policy, Florida State University
- 2001 Pi Sigma Alpha- The National Political Science Honor Society

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- Policy Process and Theory
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- Policy Process and Theory
- Nonprofit Management
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