



# Hospital ownership and medical services: Market mix, spillover effects, and nonprofit objectives

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## ARTICLE INFO

### Article history:

Received 25 April 2008

Received in revised form 9 June 2009

Accepted 10 June 2009

Available online 18 June 2009

### JEL classification:

I11

L31

L22

K20

D21

D43

### Keywords:

Nonprofit

Hospitals

Market mix

Medical services

## ABSTRACT

Hospitals operate in markets with varied demographic, competitive, and ownership characteristics, yet research on ownership tends to examine hospitals in isolation. Here we examine three hospital ownership types – nonprofit, for-profit, and government – and their spillover effects. We estimate the effects of for-profit market share in two ways, on the provision of medical services and on operating margins at the three types of hospitals. We find that nonprofit hospitals' medical service provision systematically varies by market mix. We find no significant effect of market mix on the operating margins of nonprofit hospitals, but find that for-profit hospitals have higher margins in markets with more for-profits. These results fit best with theories in which hospitals maximize their own output.

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## 1. Introduction

Research on hospital ownership has typically considered hospitals in isolation. Yet hospitals operate in markets with varied demographic, competitive, and ownership characteristics. Here we investigate the relationship between medical service provision and ownership considering not only each hospital's corporate form but also its market characteristics, including the mix of nonprofit, for-profit, and government hospital ownership in the market.

Our main goal in this article is empirical, to estimate the direct and spillover effects of ownership structure on medical services and profit margins. We also offer a new empirical measure of hospital markets and address some of the endogeneity concerns regarding hospital location that make studying ownership difficult. In addition, we hope to contribute to a decades-old debate regarding theories of the nonprofit firm, both by considering how our results

help differentiate among extant theories and by producing facts to inform future theorizing.

We examine ownership and market mix in two ways. First, we test whether medical service provision by nonprofit, government, and for-profit hospitals varies with for-profit market share. Investigating service offerings is particularly useful for understanding ownership because, in a highly regulated industry in which managers are constrained in their attempts to maximize profits (e.g., it is difficult and sometimes illegal to turn away low-paying patients), managers have some freedom to open or close a service to increase profits. This may explain why many researchers find little difference among ownership types along many dimensions (Sloan, 2000), but find large differences where administrators can influence profitability (Horwitz, 2007; Schlesinger and Gray, 2006). Second, we test whether hospital operating margins depend on the interaction between ownership and market mix.

We find that medical service provision systematically varies both by firm type and the share of for-profit hospitals within markets. Nonprofits in markets with high concentrations of for-profits are more likely to offer relatively profitable services, and less likely to offer relatively unprofitable services, than nonprofits in markets with fewer for-profits. In addition, nonprofits in markets with

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**Table 1**  
Nonprofit hospitals in low vs. high markets: theoretical predictions and medical service offerings.

Nonprofit theories	NP medical service provision low vs. high FP markets	
	Profitable services	Unprofitable services
(1) Max own output: <a href="#">Newhouse (1970)</a>	High FP markets > low FP markets	High FP markets < low FP markets
(2) Max market output or consumer surplus: <a href="#">Lee and Weisbrod (1977)</a>	High FP markets < low-FP markets	High FP markets > low-FP markets
(3) For-profits in disguise: <a href="#">Pauly and Redisch (1973)</a>	No difference	No difference
(4) Good and bad NP: <a href="#">Hirth (1999)</a>	Indeterminate	Indeterminate

high for-profit market share are more likely than other nonprofits to offer post-acute services, such as home health care, when government reimbursement policies make them relatively profitable and less likely to offer them when profit-making opportunities are low. Government hospitals demonstrate a similar, although considerably weaker, pattern. Among for-profit hospitals, we find no systematic, significant relationship between service provision and for-profit market share. Further, we find no measurable effect of market mix on nonprofit hospital profit margins. However, for-profits show higher profit margins in high for-profit markets than those in low for-profit markets.

Based on an informal discussion of nonprofit theories, we conclude that our medical services results are most consistent with either models in which nonprofits maximize their own output ([Baumol and Bowen, 1965](#); [Newhouse, 1970](#)) or some nonprofits are output maximizing ([Hirth, 1999](#)). Our finding that increased for-profit market share (and decreased nonprofit share) has a positive effect on for-profit hospitals' operating margins is also consistent with the model that nonprofits maximize output, although we cannot rule out other models in which some nonprofits maximize output and others do not.

## 2. Previous research

Slightly fewer than two-thirds of urban, general medical and surgical hospitals are nonprofit; for-profit and government hospitals make up roughly equal shares of the remainder.<sup>1</sup> Despite active hospital market consolidation during the 1990s ([Gaynor and Vogt, 2003](#)), ownership shares have remained remarkably stable, with the for-profit share increasing modestly over time ([Horwitz and Nichols, 2007, Table 1](#)).

### 2.1. Ownership mix

Despite an extensive body of empirical research on ownership, few studies have addressed whether a hospital's behavior depends not only on its own ownership, but also that of potential competitors. Some scholars suggest that for-profit market share is positively associated with responsiveness to financial incentives among nonprofits. Nonprofits in relatively high for-profit hospital penetration markets are more likely than other types to provide profitable services ([Horwitz, 2007](#); [Hughes and Luft, 1990](#)), avoid unprofitable patients ([Schlesinger et al., 1987, 1997a](#)), and spend less on admitted cardiac patients ([Ettner and Hermann, 1987](#); [Kessler and McClellan, 2002](#)). They are also more responsive to profit-making opportunities ([Cutler and Horwitz, 2000](#); [Duggan, 2000](#); [Silverman and Skinner, 2004](#)).

Economists also consider the direction of influence among firm types. [Hirth \(1999\)](#), for example, shows that competition from altruistic nonprofits can raise quality among competing

profit-maximizers. Others have similarly argued, although without systematic evidence, that nonprofits influence for-profit competitors through standard setting such as defining community and consumer expectations ([Clement et al., 2002](#); [Marsteller et al., 1998](#)) or establishing a local culture [Hansmann \(1980\)](#).

Still others claim that for-profits influence nonprofits. Testing two medical services, [Hughes and Luft \(1990\)](#) suggest that nonprofits respond to for-profit competition by offering profitable and dropping unprofitable services. Based on two case studies, [Cutler and Horwitz \(2000\)](#) suggest that nonprofit and government hospitals copy the behavior of new for-profit entrants in a hospital market. [Clement et al. \(2002\)](#) show that as nonprofits provide more charity care, competing for-profits provide less.

In considering the efficient ownership mix, [Santerre and Vernon \(2005\)](#) speculate that influences run both ways. Relying on [Grabowski and Hirth \(2002\)](#), they assert that nonprofits encourage for-profits to become more trustworthy while for-profits encourage efficiency among nonprofits. Assuming that nonprofits both (1) face relatively high demand because they have higher quality than for-profits and (2) offer relatively low supply because of their inefficiency, they regress quantity on nonprofit and government hospital market share to determine which effect dominates. Finding negative coefficients on nonprofit ownership, they conclude that the quality benefit is less than the inefficiency cost associated with nonprofit ownership and, therefore, there are too many nonprofit hospitals.

In contrast, [Lakdawalla and Philipson \(2006\)](#) contend that there should be no influence of for-profits on nonprofits or *vice versa* because, as marginal firms, for-profits are the only firms responding to market changes. This result depends on strong assumptions (e.g., a finite supply of altruistic entrepreneurs and an infinite supply of profit-seekers). The theory also precludes existing nonprofits from gaining market share.

Importantly, as we discuss in detail below, some scholars explain differences among types as evidence of market selection. [Norton and Staiger \(1994\)](#) find that nonprofit and for-profit hospitals provide similar levels of charity care, but for-profits locate where there is comparatively low demand for it. Studying three markets, [McClellan and Staiger \(2000\)](#) find that for-profits systematically locate in markets with lower total quality.

### 2.2. Theoretical background and predictions

Despite decades of research into why firms adopt nonprofit status and why ownership mix within markets persists, there is no generally accepted theory of the nonprofit firm. A complete theory should specify both the objective functions of different producer types and the mechanism by which the market mix is maintained, or how it evolves over time. The dominant theory of nonprofits is based on informational asymmetries ([Arrow, 1963](#)), which prevent full contracting over quality of care.<sup>2</sup> Several firm types might coex-

<sup>1</sup> Here we study only hospitals within MSAs. We examine rural hospitals, which account for almost half of all general hospitals but only 1/6 of admissions, elsewhere ([Horwitz and Nichols, 2008](#)).

<sup>2</sup> Others see different financial advantages enjoyed by the two types; see e.g., [Hansmann \(1987\)](#). Another model which should not be neglected is simple inertia,

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