



Economic and Policy Analysis of Specialty Hospitals*

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EXECUTIVE SUMMARY

This study examines the economic theory and published evidence related to specialty hospitals, including a review of evidence on efficiency, demand, case mix, and quality. We conduct a statistical analysis of profit margins of acute care general hospitals in markets with and without specialty hospitals. We also analyze the merits of two policy options: limiting specialty hospital entry and physician self-referral. The major findings of the study can be summarized as follows:

Demand

Demand for services provided at specialized inpatient and outpatient facilities has been growing rapidly in the past decade due to a combination of factors, including increased incidence of specific diseases, new treatment processes and technologies, and changes in consumer preferences. An important factor contributing to the growth of specialty hospitals is that some procedures or specialized services are more profitable than others, given existing Medicare and private payment rates. Not surprisingly, there has been little or no entry by specialty hospitals targeted at unprofitable services.

Efficiency

There appear to be economic advantages associated with specialization, due mainly to process redesign, learning, avoidance of diseconomies of scope, and focus on core competencies. However, the literature does not consistently suggest that either form—specialized or diversified—is superior in terms of economic efficiency. In addition, specialty hospitals appear to have equal or better patient outcomes compared to their general hospital counterparts. Hence, there is no direct evidence to suggest that specialty hospitals should be barred from entering acute inpatient care markets on the basis of economic efficiency or quality of care.

Quality

There is comparatively little evidence on the quality of care delivered in specialty hospitals. The literature we have reviewed indicates that the care provided by specialty hospitals is, at the very least, equivalent to that provided by general hospitals. However, since specialty hospitals tend to exhibit high volumes of specific procedures usually performed by high volume surgeons, to the extent there is a relationship between higher volume and superior clinical outcomes, one might expect better outcomes at high volume specialty hospitals compared to lower volume general hospitals. More generally, our review of scores from HealthGrades data indicate that there are no significant differences in mortality rates between specialty hospitals and general hospitals in the same geographic area. Finally, our survey results suggest that the intensity and quality of services are likely to be higher in specialty hospitals.

Effects on General Hospitals' Financial Stability

Specialty hospitals, like their ambulatory surgery center predecessors, compete with general hospitals in some product line markets, particularly in states without certificate of need (CON) regulation. There is no evidence, other than anecdotal, to suggest that general hospitals have been financially harmed by such competition, or that such competition is undesirable from a societal perspective.

Based on a longitudinal study of general hospital profit margins in markets with and without specialty hospitals, we find that profit margins of general hospitals have not been affected by the entry of specialty hospitals. Consistent with economic theory, the models consistently showed that the most important predictor of general hospital profitability was the extent of competition from other *general* hospitals in the same market area. General hospitals in less competitive markets (i.e., those with fewer competitors) had higher profits than general hospitals in less competitive markets. Contrary to the conjecture that entry by specialty hospitals erodes the overall operating profits of general hospitals, general hospitals residing in markets with at least one specialty hospital have higher profit margins than those that do not compete with specialty hospitals. These findings are also consistent with economic theory, which suggests that firms will enter markets in which extant profit margins are comparatively higher.

Effects on Access to Care

One potential result of an increase in competition between specialty and general hospitals is the alleged attenuation of a general hospital's ability to provide indigent care by internally cross-subsidizing losses from indigent care with profits from "high margin" procedures. Rather than limit market competition, the economically optimal public policy approach for reimbursing indigent care would be to directly subsidize any hospital for providing such care, to the extent that current subsidies (tax-exempt status, disproportionate share payments, etc.) are inadequate. Nonetheless, even in the absence of such reform in the financing of indigent care in the U.S. health care system, our analysis of Medicare cost reports fails to find any indication that entry by specialty hospitals has adversely affected the overall profitability of general hospitals in the same market area. Thus, some combination of current subsidies and profits on other "high margin" product lines appears to be sufficient to offset any possible adverse effect of specialty hospital competition on the ability of general hospitals to offer indigent care or other specific unprofitable services.

Physician Self Referral

There is no evidence to support the contention that physician self-referral to specialty hospitals has any adverse effect on patient or societal welfare. The literature on self-referral generally shows higher rates of service utilization associated with physician ownership of ancillary services. However, any inference of causality in this association is problematic at best, because those physicians most likely to use such ancillary services most intensively also have the most to gain from increased control over the availability of such services, independent of any incentive associated with a return on investment in the

facility itself. Thus, it is extremely difficult to quantify the impact of the financial incentive associated with physician ownership *per se* on the volume of self-referrals.

More importantly, the existence of an association between physician ownership of self-referral for *ancillary* services provides no evidence that ownership of acute care facilities would result in similar differences in utilization. The direct financial incentive for physician self-referral associated with physician investment in specialty hospitals is unlikely to play a major role in a physician's use of a specialty hospital, for four reasons: (1) the extent of investment for the vast majority of physicians with ownership interests in specialty hospitals is small compared to the extent on physician ownership of *ancillary* services; (2) there is no direct evidence that physician self-referral is motivated primarily or disproportionately by financial incentives associated with physician ownership; (3) there is no evidence that self-referrals result in worse outcomes than other types of referral; and (4) in the case of physician ownership of acute care facilities, it is likely that the magnitude of financial incentives is small relative to the more direct financial incentive associated with fee-for-service payment for physician services.

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1. INTRODUCTION

Hospital specialization has become a controversial topic in recent years, culminating in a moratorium issued in 2003 by Congress directing the Center for Medicare and Medicaid Services (CMS) to cease reimbursements to new physician-owned specialty hospitals for those Medicare and Medicaid patients referred by physicians with a financial interest in the facility.¹ The moratorium, which comes in addition to existing laws in many states prohibiting the operation of some types of specialty hospitals, is in part a response to the concern among incumbent general hospitals that specialized facilities may harm the community by undermining the ability of general hospitals to internally cross-subsidize unprofitable services, many of which may be considered essential to the community.

This report focuses on two interesting and important economic questions raised by the moratorium. First, are there meaningful economic advantages associated with hospital specialization, such as lower costs or higher quality? Second, does the presence of specialty hospitals reduce the ability of general hospitals to provide necessary but unprofitable services, such as emergency care and other services disproportionately provided to low-income groups? Each of these questions has policy implications. If specialty hospitals are more efficient or higher quality or both, economic theory and prevailing competition policy in the U.S. generally support allowing free market entry. That is the argument made recently by a Federal Trade Commission report and an opinion essay in the *Wall Street Journal* (Federal Trade Commission and U.S. Department of Justice 2004; Wall Street Journal 2005). On the other hand, if specialty hospitals interfere with the ability of general hospitals to provide unprofitable services, separate policy concerns arise.

This report is divided into five sections. Section 2.0 provides a brief overview of the structure of the specialty hospital industry. Section 3.0 examines the first question—whether there are meaningful economic advantages associated with hospital specialization, such as lower costs or higher quality. The primary methodologies for the analysis presented in Section 3.0 are (a) published studies and reports and (b) observations from our case studies of five surgical hospitals, two in central California and three in South Dakota.² Section 4.0 reviews the evidence on the quality of care and case

¹The moratorium was enacted by Congress as part of the Medicare Prescription Drug, Improvement and Modernization Act of 2003 (MMA). It became effective when the law was signed on December 8, 2003, and will expire June 8, 2005. However, the Medicare Payment Assessment Commission (MedPAC) recently recommended that the moratorium be extended to December 2006 in order to allow for more time to study the effects of specialty hospitals on general community hospitals.

² These states were chosen due to the relatively high proportion and maturity of specialty hospitals. Site visits generally involved question and answer sessions with all levels of

mix severity at specialty hospitals. The analysis presented in Section 4.0 relies on published studies, reports, and our own analysis of published quality data from HealthGrades®. Section 5.0 offers guidance from economic theory on assessing the pros and cons of the current policy debates over specialty hospitals. Section 5.0 includes an in-depth statistical analysis of the effect of specialty hospital market entry on the average profit margins of general hospitals. The analysis combines data from several sources, including Medicare Cost Reports and the Bureau of Health Profession's Area Resource File. Rather than make explicit policy recommendations, we discuss some of the salient economic issues relevant to the debate. Concluding remarks follow in Section 6.0.

1.1 Methodology

This report is based on data from four different sources. All sections rely on data drawn from published studies and reports. For some of the arguments and analyses we undertake, there is limited relevant published literature and reports, primarily because the debates over pros and cons of specialty hospitals are a relatively new occurrence. In cases where there is an insufficient supply of published data and analyses, we conducted analyses based on data collected from (1) site visits, (2) secondary data sources, and (3) our own survey of specialty hospitals. The secondary data sources used for this analysis include Medicare Cost Reports (HCRIS), quality data from HealthGrades, and market area data from the Bureau of Health Profession's Area Resource File (ARF). These datasets are described in greater detail in Section 5.1.1.

Throughout the report, we describe some of the findings from case studies of five surgical hospitals, two in central California and three in South Dakota. These states were chosen due to the relatively high proportion and maturity of specialty hospitals. Site visits generally involved question and answer sessions with all levels of the management team (including physician owners) at each facility, followed by tours. Also provided were documents on management strategy, quality assurance, consumer satisfaction, physician ownership, and cost management. The main goal of the site visits was to improve our understanding of the layout and functioning of specialty hospitals. Thus, rather than focus this report on the findings from the site visits, we report the main findings relevant to each section of the report. For some of the discussions, the site visits did not directly provide any relevant insights.

In addition to secondary data and site visits, we conducted a survey of the 70 specialty hospitals belonging to the American Surgical Hospital Association. The survey achieved a 50 percent response rate, but incorporating existing data from ASHA resulted in item-level response rates ranging from 50 to 90 percent. Descriptive statistics from the survey are provided in Table 2 and the survey instrument is provided in Appendix A.

the management team (including physician owners) at each facility, followed by tours. Also provided were documents on management strategy, quality assurance, consumer satisfaction, physician ownership, and cost management.

Table 2
Survey of ASHA Member Hospitals:¹ Means for Selected Survey Items

Variable	Mean
Q6-8: Accreditation (%)	67.0
Q11: Bed capacity	24.6
Q12: Staffed inpatient beds	19.3
Q13: Operating rooms	5.2
Q14: Intensive care beds	4.0
Q15: Recovery beds	17.2
Q16: Percent with ER (%)	42.1
Q18: Number of owners	32.7
Q19: MD owners	31.6
Q20: MD owners admit \geq 5 patients/year	20.6
Q21: Q20 with 0-1% ownership stake	13.0
Q22: Q20 with 2-5% ownership stake	11.7
Q23: Q20 with 6-9% ownership stake	1.4
Q24: Q20 with \geq 10% ownership stake	0.8
Q25: Inpatient discharges	835.1
Q26: Inpatient days (overnight stay)	2,269.6
Q27: Inpatient days (observation days)	884.2
Q28: Surgeries (overnight stay)	717.7
Q29: Outpatient surgeries (no overnight stay)	3,105.5
Q30: Total gross patient care revenue ²	\$39,300,000
Q32: Percent Medicare revenue (%)	32.4
Q33: Percent Medicaid revenue (%)	3.7
Q34: Percent Commercial revenue (%)	46.4
Q35: Percent other revenue (%)	18.1
Q38: Percent revenue as charity care (%)	2.1
Q39: State income tax paid, previous tax year	\$830,661
Q40: Federal income tax paid, previous tax year	\$994,082
Q41: Property tax paid, previous tax year	\$221,463
Q44: Full-time equivalent (FTE) RNs	52.1
Q45: Patient to RN ratio	3.4
Q48: Percent collect patient satisfaction data (%)	92.1
Q50: Annual number of inpatients transferred	7.6
Q51: Percent with transfer arrangement (%)	92.1

Sources: Survey of ASHA membership; see section 1.1 for description and Appendix A for survey instrument.
Notes: (1) based on responses from 35 specialty hospitals supplemented with data from the American Surgical Hospital Association; item-level response rates range from 50 to 90 percent; (2) includes inpatient and outpatient.

2. OVERVIEW OF HOSPITAL MARKET

During the latter half of the twentieth century, industries began exploring new ways to organize production. One of the most prominent of these changes was the adoption of lean production, flexible specialization, and focused factories (Skinner 1974; Womack, Jones, and Roos 1990; Essletzbichler 2003), which resulted in many business establishments becoming less diverse and more focused (Gollop 1991). The hospital industry appears to be following a similar path with the growth of free-standing specialty hospitals and specialized units within general hospitals (Myers 1998; Eastaugh 2001; Robinson 2005).

Demand for specialized inpatient and outpatient services has been growing rapidly in the past decade (General Accounting Office 2003a). The increase in demand is most likely due to a combination of factors, including increased incidence of specific diseases, new treatment processes and technologies, and changes in consumer preferences. Analogous to non-health care industries, the hospital industry has been the subject of renewed emphasis on quality of care and customer satisfaction. In response, general and specialty hospitals alike have developed consumer-oriented centers of care focused on providing a limited range of services tailored to the specific needs of patients (Baum 1999; Romano and Kirchheimer 2001; Eastaugh 2001; Smith 2002; Urquhart and O'Dell 2004; Herzlinger 2004a; Lo Sasso et al. 2004).

Specialty hospitals are typically defined as those that treat patients with specific medical conditions or are in need of specific medical or surgical procedures.³ The former describes hospitals specializing in psychiatric care, cancer care, rehabilitation, women's care, children's care, and certain chronic diseases; the latter describes hospitals specializing in cardiac, orthopedic, and general surgery. As of 2002, there were a total of more than 1,000 specialty hospitals in the U.S. (Table 1). These estimates exclude specialized "distinct part" units of general hospitals, a large segment of the specialized facility market. For example, Schneider, Cromwell, and McGuire (1993) reported that there are more than 900 distinct psychiatric units and more than 500 distinct rehabilitation units within general acute care hospitals.

The recent political controversies surrounding specialty hospitals have focused primarily on facilities specializing in cardiac, orthopedic surgery and general surgery, and to a lesser extent obstetrics and gynecology. There are approximately 100 to 120 of these hospitals currently operating in the U.S. Growth in surgical hospitals ranged from 33 percent (orthopedic and general surgery) to 70 percent (cardiac surgery) during the seven-year period from 1995 to 2002. Most of these facilities are located in states without Certificate-of-Need (CON) programs, which regulate the construction and augmentation of health care facilities. States with the highest concentrations of surgical specialty hospitals are South Dakota, Kansas, Oklahoma, Texas, Louisiana, Arizona, and California.

³ For example, the General Accounting Office defines specialty hospitals as those that "tend to focus on patients with specific medical conditions or who need surgical procedures" (General Accounting Office 2003b).

Table 1
Trends in Numbers of Specialty Hospitals, 1990-2003

Facility Type	1995	2002	% Change, 1995-2002
Psychiatric ^{1,2}	675	488	- 27.7%
Rehabilitation ^{1,2}	NA	216	--
Extended Stay ^{1,2}	NA	270	--
Obstetrics and Gynecology ^{1,5}	12	18	+ 41.7%
Orthopedic and General Surgery ^{3,5}	60	80	+ 33.3%
Cardiac Surgery ^{4,5}	10	17	+ 70.0%
Other ⁶	96	100	+ 4.2%

Notes and sources: (1) American Hospital Association *Hospital Statistics* (1996/97 and 2004 editions); (2) Centers for Medicare and Medicaid Services; (3) American Surgical Hospital Association; (4) MedCath Corporation; (5) General Accounting Office (2003a); (6) includes hospitals specializing in children, cancer, respiratory diseases, and ear/nose/throat.

The distinction between surgical specialty hospitals and all other specialty hospitals is an important one because the current debates and controversies refer exclusively to surgical hospitals. There are two likely reasons for the concentration on surgical hospitals. First, although reliable evidence is lacking, it is possible that the average operating margins associated with surgical procedures are higher than those associated with, for example, psychiatric and rehabilitation care. Second, 70 percent of surgical hospitals have at least some level of physician ownership (General Accounting Office 2003a), which is a concern to some policy makers. Some additional discussion of these issues is provided in Section 5.0.

Another important aspect of the specialty hospital industry is the motivation for market entry. Site visits and published literature identify several important motivating factors (Walker 1998; MedPAC 2003; Casalino, Pham, and Bazzoli 2004; Casey 2004; Rohack 2004; Iglehart 2005). Motivations include the ability of physicians to (1) directly control quality of care; (2) optimally schedule operating room time (e.g., allow more choice in operating room block time and minimize schedule disruptions caused by emergent cases); (3) select patients that are clinically appropriate for the specialized setting; (4) maintain greater decision-making authority over equipment and supply purchases; and (5) capture a portion of the facility fee as additional entrepreneurial earnings. An additional motivation for market entry is likely to be the existence of above-average profit margins on certain procedures. As is the case in any industry, it is the exception to observe market entry into products and services for which profit margins are unusually low or negative.

Some of the other factors identified relate to physicians freeing themselves from contract restrictions and other bureaucratic apparatus common to larger general hospitals. Interestingly, many of the comments recorded during the site visits mirror those expressed by physicians in single-specialty medical groups. Casalino, Pham, and Bazzoli (2004) report that one of the motivating factors for single-specialty groups was to “avoid the complicated governance and operational issues engendered by having primary care and specialty physicians in the same organization” (p.86).

3. EFFICIENCY

An important question concerning the efficiency of specialty hospitals is whether there are distinct economic advantages or disadvantages to specialization. Embedded in this question is whether there are advantages or disadvantages associated with the dominant hospital organizational structure, which consists primarily of full-service diversified general hospitals. This section reviews the theory and evidence on four aspects of efficiency that are relevant to specialization: (1) economies of scale, (2) economies of scope, (3) competencies and learning, and (4) volume-outcome effects.

3.1 Economies of Scale

Economies of scale exist if the average costs of producing a product or service decline as the volume of production increases. The evidence on economies of scale in the production of hospital services, while highly variable, indicates that U.S. general hospitals typically experience scale economies up to approximately 10,000 discharges per year (Cowing 1983; Vita 1990; Gaynor and Anderson 1995; Keeler and Ying 1996; Dranove 1998; Li and Rosenman 2001). However, the same evidence suggests that scale economies vary significantly by product and service line. In order to assess the potential role of scale economies in specialty hospital efficiency, scale economies for specific services (e.g., total knee replacement) in specialty hospitals versus general hospitals would need to be compared. We are not aware of any study that does so. However, for many specific surgical procedures, the volume of these specific services performed at specialty hospitals typically exceeds that performed at general hospitals within the same market area (Cram, Rosenthal, and Sarrazin 2004). Thus, to the extent economies of scale exist in these specific procedures, they are likely to be realized to a greater degree in specialty hospitals compared to general hospitals.

3.2 Economies of Scope

In some cases the joint production of two or more products or services can be accomplished at lower cost than the combined costs of producing each individually. This is often the case when production relies on common resources, such as technology, workers, inputs, and general overhead. Cases where the costs of joint production are lower than the costs of separate production are said to exhibit economies of scope (Panzar and Willig 1981). The decision to specialize will depend in part on the extent to which firms' existing scope of products and services exhibit diseconomies of scope (i.e., where joint production is more costly than separate production). Conversely, the decision to diversify will in part be based on the extent to which joint production costs are less than separate production costs.

Evidence on economies of scope in the U.S. hospital industry is inconclusive. Menke (1997) found limited evidence of inpatient-outpatient scope economies in chain and non-chain hospitals. Similarly, Fournier and Mitchell (1992) found significant scope economies among select outpatient services and surgery services, but their study is based on 20-year old data from one state. Sinay and Campbell (1995) examined 262 merging acute care hospitals in the U.S. during the period 1987 to 1990. Of the service pairings

studied, evidence of economies of scope was found between acute care and sub-acute care (in merging hospitals) and between intensive care and outpatient visits (in control hospitals); all other pairings showed either diseconomies of scope (e.g., acute care and outpatient care; intensive care and sub-acute care) or were statistically insignificant. Rozek (1988) failed to observe scope economies in general hospital diversification into psychiatric services, and Li and Rosenman's (2001) study of hospitals in the state of Washington reached inconclusive findings on scope economies. The lack of consistent findings on economies of scope suggests that it is probably not a significant source of production economies for general hospitals. Thus, it would be difficult to argue that specialty hospitals are less efficient than general hospitals due to the absence of scope economies.

3.3 Learning and Competencies

Skinner (1974) stressed that “simplicity, repetition, experience, and homogeneity of tasks breed competence.” Learning occurs as the experience of production in one time period influences the production in a later time period; that is, the production process is assumed to have some degree of flexibility and can change over the relevant range of output (March 1996; Nooteboom 2000; Greve 2003). The implication is that the costs of producing the first batch of output are greater than the costs of producing a subsequent batch due to the learning that occurred during the production of the first batch. Assuming that experiences of producing the first batch can be applied to the second batch (and other subsequent batches), the average costs of production are expected to decline as output cumulates over time. The learning effect will depend on the ability of the firm to process information during the production process and then apply that information appropriately.

The learning process is critical to the formation and adaptation of organizational routines, which include rules of thumb, guidelines, templates, and protocols (Nelson and Winter 1982). Specialized routines are the subcomponents of organizational “know how” and “core competencies,” and are often sources of comparative advantage and production economies (Chandler 1992; Wruck and Jensen 1994; Greve 2003). Core competencies refer to firms' existing stock of knowledge assets (including tacit knowledge and know-how), skills, and resources. By diversifying and expanding into activities that are related to core competencies, firms are typically able to take better advantage of the learning process and improve managerial efficiency (Teece et al. 1994; Teece and Pisano 1994; Hill 1994; Danneels 2002).⁴ In addition, limiting expansion into related business lines is likely to minimize some of the negative tradeoffs associated with growth in firm size, such as influence costs and other forms of incentive attenuation (Milgrom and Roberts 1990). Consistent with Skinner's emphasis on the value of repetition, concentrating on core competencies is believed to enhance the learning process by assuring that decision-making situations are repeated in sufficiently large numbers. According to Teece et al. (1994, p.17), “If too many parameters are changed simultaneously, the ability of firms to

⁴ For example, focusing on core competencies has been associated with improved supply chain management (primarily through standardization), simplified human resource management, and streamlined production scheduling.

conduct meaningful quasi experiments is attenuated.” Given the complexities of the learning process, the costs of learning in some cases may be lower for smaller specialized firms. Smaller firms may have the advantage of being able to allocate the majority of the resources available for learning and adaptation to a relatively small set of related production process (Almeida, Dokko, and Rosenkopf 2003).

Learning and core competencies have been shown to be important determinants of the performance of health care organizations. In health care setting the learning process is to some extent evident in the positive association between procedure volume and outcomes (discussed in greater detail in the next section). During our site visits, we consistently observed a culture supportive of coordination and cooperation aimed at achieving ongoing improvements in efficiency and quality. Specialty hospital managers generally attributed their success in process adaptation to three factors: (1) relatively small size, which enables more rapid and efficient decision making; (2) flat hierarchical structures, which allow decision making and process improvement to migrate to the most appropriate level; and (3) focused and consistent management goals, which make it easier for team members to learn and their roles. Managers also emphasized the importance of performance feedback, mainly through surveys of customer satisfaction. Again, managers indicated that their relatively small size allowed them to spend more time collecting, analyzing and acting on customer feedback. While it is possible that diversified general hospitals are able to achieve similar learning effects, the smaller scale of specialty hospitals may lower the costs associated with learning.

In health care settings, there also appear to be distinct advantages to focusing production within core competencies.⁵ Shortell, Morrison, and Hughes (1989), in their three-year case study of eight large hospital systems, found that the best performing systems and hospitals were the ones that avoided diversification into unrelated activities, thereby minimizing diseconomies of scope and maximizing efficiencies associated with learning. Eastaugh (2001) examined a panel of 219 U.S. acute care hospitals from 1991 to 2000, finding that a 31 percent increase in specialization over the time period was associated with an eight percent decline in costs per admission. Douglas and Nyman (2003) review the theory of core competencies in hospitals and test the theory using data from the 32 largest hospital markets in the U.S. They found that the degree to which hospitals focused on core competencies was positively related to hospital financial performance.

In terms of core competencies, our site visits reached similar conclusions. When asked why their facility performed one set of procedures or services and not another, managers consistently indicated that they had a strong desire to not venture too far from the core of their collective knowledge. Managers and owners emphasized that the key decision makers are typically physician owners, most of whom are likely to feel most comfortable

⁵ The relationship between core competencies and hospital efficiency is relatively understudied. General discussions are provided by Eastaugh (2001; 1992); Snail and Robinson (1998); Douglas and Ryman (2003); Coddington, Palmquist, and Trollinger (1985), Porter and Teisberg (2004), Herzlinger (2004c), Moore (1990), and Walker and Rosko (1988).

focusing on the delivery of services in their specialty field. One chief executive officer and physician owner stressed that specialty hospitals often attract the most highly trained and skilled physicians in the community by allowing them to essentially redesign the care process based on the state of the art in their field. We found corroborating anecdotal evidence in the trade press (Walker 1998; Baum 1999; Daus 2000; Casey 2004; Wolski 2004; Zuckerman 2004).⁶

3.4 Volume-Outcome Effects

Several studies have found a positive association between the volume of services a hospital performs and the quality of the outcomes (Hillner, Smith, and Desch 2000; Halm, Lee, and Chassin 2002; Shahian and Normand 2003). One potential criticism of specialty hospitals is that the volume of cases may be too low to capture the positive effects of volume on patient outcomes. There are, however, five important limitations to these findings. First, the magnitude of the relationship is highly sensitive to case mix adjustment (Halm, Lee, and Chassin 2002). Second, there is considerable debate over how much volume is necessary to improve outcomes. For example, a common belief is that outcomes for percutaneous coronary interventions are better in hospitals that perform more than 400 such procedures per year. However, Epstein et al. (2004) found that there were no significant mortality differences between hospitals with medium volume (200-399 cases per year) and high volume (400-999 cases per year). Third, many studies do not differentiate between individual physician effects and hospital effects. It is possible that the volume-outcome relationship reflects differences in experience levels of individual physicians, most of whom maintain admitting privileges at multiple institutions (Robinson et al. 2001). Fourth, volume-outcome relationships are likely to be procedure specific. Again, on average specialty hospitals have higher procedure-specific volumes than their general hospital counterparts (Cram, Rosenthal, and Sarrazin 2004).

The fifth limitation is that the causal relationship between volume and outcome is unclear: do patients treated at high-volume hospitals achieve better outcomes because of learning and practice (the "practice makes perfect" hypothesis), or do hospitals with better quality reputations attract higher volumes of patients (the "selective referral" hypothesis) (Hughes et al. 1988)? Some recent studies have used instrumental variable techniques to disentangle these effects; one such paper found strong evidence of the

⁶ MedCath's description of their facilities is apposite: "Externally, MedCath's heart hospitals appear typical; however, a step inside reveals important differences: Physicians empowered to make decisions about hospital operations; state-of-the-art operating rooms; cutting-edge equipment and technology; centrally located services such as radiology, pharmacy and laboratories; nursing stations strategically positioned to allow better patient monitoring; and large, single-patient, fully equipped rooms that avoid unnecessary patient moves and permit family members to remain overnight. Above all, physicians and nurses freed from bureaucratic and administrative chores so they can devote a majority of their time and energy directly to caring for their patients." (MedCath Corporation 2001)

“practice makes perfect” hypothesis for coronary artery bypass graft surgery.⁷ There is some evidence that both hypotheses explain differences in outcomes but, nonetheless, taken together these two hypotheses explain a relatively small proportion of the overall variation in patient outcomes (Luft 1980; Luft, Hunt, and Maerki 1987).

3.5 Summary

The preceding discussion suggests that there are several areas in which specialty hospitals achieve production economies. First, specialty hospitals are able to take advantage of economies of scale and scope by producing relatively high volumes of a limited scope of services, and by lowering fixed costs by reengineering the care delivery process. Second, the site visits consistently found evidence of learning and core competencies. Managerial and clinical staff indicated a strong desire to focus on a relatively narrow array of tasks, and indicated a commitment to perfecting those tasks. The evidence on scale and scope economies and core competencies suggests that there are efficiency reasons for some degree of diversification, but that expansion into unrelated activities can result in diminished financial performance. Specialty hospitals also may in some cases possess a technological advantage or resource that is unique in the market. This is likely to be the case for many entering specialty hospitals, as most have had the opportunity to redesign care delivery processes from the ground up.

Perhaps as a result of these efficiencies, specialty hospitals appear to be capable of offering more intensive services for the same price. Specialty hospitals tend to have substantially higher nurse-patient ratios⁸ and tend to place greater emphasis on ancillary services identified by patients as important, such as comfortable family-friendly rooms, more attention from administrative and clinical staff, and the mitigation of common inconveniences (e.g., appropriately located elevators and convenient parking). Specialty hospitals also appeal to physicians by offering newer equipment, more staff assistance, and more flexible operating room scheduling. These are costly services, yet specialty hospitals must compete for contracts with the same managed care organizations that general hospitals do; similar to general hospitals, they must also accept the Medicare fee schedule as payment in full.

⁷ Unpublished working paper: Seider H, M Gaynor, and WB Vogt (2004) “Volume-Outcome and Antitrust in U.S. Health Care Markets” Carnegie-Mellon University.

⁸ Kovner et al. (2002) found that the median number of RN hours per adjusted patient day was 6.43 for the study’s 534 general hospitals. For the five specialty hospitals we visited, RN hours per adjusted patient day ranged from 10 to 15 hours per patient day. Ideally, however, the appropriate comparison would be between cardiac and orthopedic units of specialty hospitals and cardiac and orthopedic units of general hospitals. We know of no such studies, and we were not able to identify a source of data on nurse staffing ratios within specific units of general hospitals.

4. CASE MIX AND QUALITY

4.1 Case Mix

There is some evidence that, on average, specialty hospitals treat patients with lower acuity compared to general hospitals (General Accounting Office 2003a, 2003b; Cram, Rosenthal, and Sarrazin 2004).⁹ These findings are consistent with the observed case mix differences between ambulatory surgery centers and general hospitals (Winter 2003). The focused nature of specialty facilities may be better suited to patients whose care involves relatively little uncertainty, or whose condition is reasonably well defined. General hospitals may be more efficient in treating complex cases, particularly cases that allow them to exploit scope economies across service lines. In sum, it is possible that the apparent cost advantage of specialty hospitals is in part attributable to a healthier average case mix.

It should also be noted that prospective administered pricing mechanisms create incentives for general and specialty hospitals alike to focus on diagnosis categories and procedures where the administered price exceeds facilities' average costs. Medicare's administered pricing system (PPS) has been shown to affect the scope of services offered by acute care hospitals. The PPS system employs a fee schedule based on approximately 500 diagnosis related groups (DRGs); each DRG is mapped to a price, with some hospital-specific adjustments. Payment by DRG provides strong incentives to hospitals to specialize in those DRGs for which they have relatively low production costs (Dranove 1987). In the context of specialty hospitals, Robinson (2005) posits that "The success enjoyed by the specialized firms reflect astute selection of services and markets as much as efficiency in delivering care."

4.2 Quality

Empirical evidence on the quality of care provided by specialty hospitals is limited to two studies, one by the Lewin Group (2004) and another by Cram et al. (2004) from the University of Iowa. The Lewin study used Medicare Part A (MedPAR) data to compare eight MedCath heart hospitals to 1,056 peer general hospitals that perform open-heart surgery in the U.S. After adjusting for risk of mortality, MedCath heart hospitals on

⁹ Dobson (2004), in a study conducted by Lewin Group for the MedCath Corporation, found case-mix results counter to the GAO study and Cram et al. (2004). The Lewin Group found that MedCath cardiac hospitals have a 21 percent higher case mix severity for cardiac patients compared to their community general hospital peers. The differences in findings are likely attributable to differences in the sample and the measurement of severity or complexity. For example, the Lewin Group study used DRG weights to measure severity, whereas Cram et al. used a predicted mortality model based on age and presence of seven comorbid conditions. However, the Lewin Group findings are consistent with anecdotal and empirical evidence that admitting physicians may perceive specialized facilities as being more appropriate for complicated cases, due in part to the positive volume-outcome relationship (Baum 1999; Magid et al. 2000).

average exhibited a 16 percent lower in-hospital mortality rate for Medicare cardiac cases compared to peer general hospitals.

Cram, Rosenthal, and Vaughan-Sarrazin (2004) found no significant differences in mortality for cardiac patients treated at specialty hospitals and general hospitals, after adjusting for lower severity and higher procedure volume at specialty hospitals.¹⁰ Similar results have been found when comparing ambulatory surgery centers and general hospitals (e.g., Warner, Shields, and Chute 1993; Mezei and Chung 1999). Data gathered from our site visits mirror these findings. Managers of specialty hospitals consistently reported two factors they believed to have been critical to achieving high quality patient outcomes: high volume and high nursing intensity. Consistent with the Cram et al. findings of higher procedure volume, managers of specialty strongly believed that they were improving care through ongoing learning and improvement. Specialty hospitals also reported nurse-patient ratios higher than the national average,¹¹ which suggests that they may be able to capture some of the positive quality and outcome effects associated with richer nurse staffing (Kovner et al. 2002; Lang et al. 2004; Stanton and Rutherford 2004; Mark et al. 2004).

Limited scope is also likely to increase accountability associated with the smaller set of procedures. For example, a specialty hospital leader at one of the visited hospitals remarked that “four procedures account for seventy percent of our business; if we develop any kind of quality problem in one or more of those procedures it’s a huge problem for our organization.” In addition, specialty hospitals typically engage in extensive collection of data on quality and patient satisfaction, and use these data to modify care processes (Walker 1998; Fine 2004; Iqbal and Taylor 2001). Among the ASHA member hospitals surveyed, 92 percent reported that they engage in regular assessments of customer satisfaction. Finally, there is consistent anecdotal evidence that the kind of care delivered by the typical specialty hospital is consistent with the general trend toward “consumer-driven” health care (e.g., O’Donnell 1993; Baum 1999; Leung 2000; Urquhart and O’Dell 2004; Hoffer Gittel 2004; Herzlinger 2004b).

¹⁰ In this respect the Cram et al. study and the Lewin Group study found similar results, although the Lewin study found that risk-adjusted in-hospital mortality rates in cardiac hospitals were 16 percent *lower* on average than the mortality rates of community hospital peers.

¹¹ Kovner et al. (2002) found that the median number of RN hours per adjusted patient day was 6.43 for the 534 hospitals studied. For the five specialty hospitals we visited, RN hours per adjusted patient day ranged from 10 to 15 hours per patient day. However, these data comparisons are limited; ideally, nurse staffing ratios should be compared only within particular product and service lines (e.g., orthopedic).

4.2.1 HealthGrades Analysis

HealthGrades is a national organization that produces hospital quality reports for over 5,000 U.S. acute care hospitals.¹² We merged membership data from ASHA and MedCath to publicly available quality data published on the HealthGrades website. There were 22 matched hospitals, representing approximately 31 percent of the ASHA hospital sample. For those hospitals, we examined the mean quality score (based on a 1-5 Likert scale) for the most common sets of procedures performed by the 22 hospitals. Consistent with the Lewin Group study and Cram et al., the results show that specialty hospitals typically performed at least as well as general hospitals in the same geographic region. Based on measures of in-hospital mortality (including 1 and 6 month post-discharge mortality rates), the mean score for the 22 specialty hospitals was a 3.86 out of 5, which was not statistically different from the mean scores for general hospitals in the same market areas.

5. POLICY ISSUES

The debate over specialty hospitals has raised several policy questions, two of which have received a high level of attention. First, do specialty hospitals harm the ability of general hospitals to provide indigent care? Some argue that specialty hospitals take profitable business away from general hospitals, and as general hospitals lose market share, particularly in high-margin product lines, they are hampered in their ability to provide low-margin services and meet their implied obligations to serve the community. Second, does having an ownership stake in the facility create financial incentives for physicians to provide inappropriate and unnecessary treatment? What are the optimal policy options to address these questions? Rather than make explicit policy recommendations, we discuss some of the salient economic issues concerning these two policy problems.

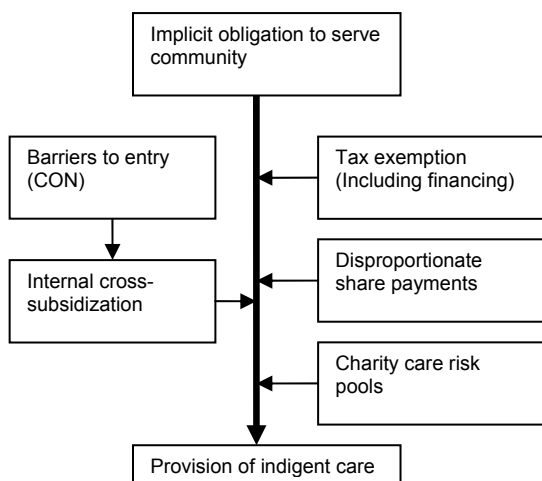
In this section policies are discussed in terms of their effectiveness in accomplishing intended objectives. In order to assess the net effect of a policy, ideally it is necessary to take into account all direct and indirect effects attributable to the policy. The sum of these effects is analogous to what economists refer to as change in net social welfare; that is, the extent to which the policy effects aggregate well-being. For example, the Federal Trade Commission recently emphasized that health care policies intended to mitigate some of the less desirable side effects of competition must be weighed against the losses normally resulting from restrictions on market entry and competition (Federal Trade Commission and U.S. Department of Justice 2003, 2004).

¹² HealthGrades quality measures are based on data from Medicare Part A (hospital) discharge abstracts for the time period 2001-2003. For more information on methodology and analysis, refer to www.HealthGrades.com and the HealthGrades report entitled “The Seventh Annual HealthGrades Hospital Quality in America Study” (HealthGrades Inc. 2004)

5.1 Indigent Care and Cross-Subsidization

The indigent care issue has several components. The first issue has to do with the practice on the part of general hospitals to meet their implicit obligation to serve the community¹³ by cross-subsidizing low-margin services with high-margin services combined with other government subsidies. Many of the former state rate regulation programs were explicitly designed to help acute care hospitals meet these obligations (Fournier and Campbell 1997; Schneider 2003); however, all but one of the state rate regulation programs were dismantled during the 1990s. In the absence of state rate regulation, hospitals have relied on six other mechanisms to pay for unprofitable services: (1) tax-deductible donations, (2) tax-exempt bond financing, (3) exemption from income and property taxes, (4) internal cross-subsidization, (5) Medicaid disproportionate share payments (additional payment for treating a disproportionate share of Medicaid patients), and (6) state-administered charity care risk pools¹⁴ (Figure 1).

Figure 1
Non-Profit General Hospital Methods for Funding Indigent Care



Tax exemption is perhaps the most widespread subsidy provided to non-profit general hospitals. Non-profit tax status allows hospitals to avoid property and income tax in exchange for an obligation to serve the community. However, Kane and Wubbenhorst (2000) found that the amount of charity care provided by hospitals is significantly less

¹³ Acute care hospitals' implicit obligation to serve the community is based on two policies: the Hospital Survey and Construction Act of 1946 and non-profit tax exemption. The nominal intent of the Hospital Survey and Construction Act of 1946 (commonly known as the Hill-Burton Act) was to bolster the relatively under-developed postwar hospital industry by requiring states "to develop programs for the construction of such public and other non-profit hospitals as will, in conjunction with existing facilities, afford the necessary physical facilities for furnishing adequate hospital, clinic, and similar services to all their people" (*Hospital Survey and Construction Act 1946*).

¹⁴ See generally Lewin and Altman (2000).

than the amount of tax benefit accrued through non-profit status.¹⁵ Thus, even if tax exemption were the only means for hospitals to fund indigent care, the amount of the benefit on average appears to be more than sufficient to fund prevailing levels of indigent care. Although specialty hospitals generally provide less charity care (approximately 2.1 percent of gross patient care revenues; Table 2), per facility they contribute on average approximately \$2 million annually in state and federal taxes. This represents an additional 5.1 percent of gross patient care revenues. The combined 7.2 percent of gross patient care revenues exceeds the average charity care provision of tax-exempt general hospitals, which is approximately 5 to 6 percent of revenues (American Hospital Association 2005).

Hospital internal cross-subsidization is to be distinguished from the popular notion that hospitals shift costs between third-party payers; that is, “one group pays more because another pays less” (Morrisey 1994). In this case, hospitals cross-subsidize low-margin indigent services with the proceeds from high-margin services. Under normal circumstances, hospital internal cross-subsidization would not be sustainable, mainly because sustained high margins on some services would encourage market entry, and as firms entered the excess profits would be competed away.¹⁶ In order for cross-subsidization to work, government must restrict market entry, either through certificate of need (CON) or some other means. Indeed, that is how many states currently approach the problem, and an important reason why Congress has resorted to the specialty hospital moratorium.

There are at least two problems with policies encouraging cross-subsidization of this kind. First, the policy relies on CON to limit market entry, and there is a large volume of research critical of CON.¹⁷ Studies of the impact of CON programs have consistently found the programs to be ineffective at controlling costs and enhancing access. Sloan and Steinwald (1980) found that mature CON programs had an insignificant effect on hospital costs, and immature CON programs actually increased hospital costs. Lanning, Morrissey and Ohsfeldt (1991) and Antel, Ohsfeldt, and Becker (1995) also conclude that CON is associated with higher inpatient costs and expenditures per capita. A possible explanation is that the CON constraint prevents hospitals from employing the least-cost

¹⁵ A summary of these issues can also be found in Nancy Kane’s recent testimony to the Subcommittee on Oversight of the U.S. House Committee on Ways and Means (Kane 2004).

¹⁶ This is a common occurrence in most industries. In the language of the current debate, this would be considered cream skimming. An important question is whether it is optimal policy to discourage triaging of care across settings according to intensity, given the extensive literature on the cost and quality benefits associated with moving patients from inpatient to outpatient settings following the implementation of Medicare’s PPS.

¹⁷ Currently, 14 states have no CON program and another six states maintain CON programs only for long-term care (Conover and Sloan 2003).

combination of inputs to produce inpatient services, resulting in allocative inefficiency.¹⁸ Further, there is no evidence that the repeal of CON was associated with an increase in hospital expenditures (Conover and Sloan 1998).¹⁹ As a result of the apparent failure of CON to achieve its stated goals, many state CON programs have been either terminated or significantly reformed since the repeal of the Health Planning Act in 1986 (Conover and Sloan 1998). It would be more difficult in theory for hospitals located in competitive markets in non-CON states to engage in internal cross-subsidization; instead, such hospitals would have to rely on tax exemption, disproportionate share payments, and charity care risk pools to fund indigent care.

Second, it is not clear whether the losses in net social welfare associated with restricting market entry exceed the costs of alternative means of assuring the provision of indigent care, such as direct subsidies. The Federal Trade Commission's recent report on health care competition integrated this point into one of their policy recommendations, emphasizing that "[competition] does not work well when certain facilities are expected to cross-subsidize uncompensated care. In general, it is more efficient to provide subsidies directly to those who should receive them, rather than to obscure cross subsidies and indirect subsidies in transactions that are not transparent" (Federal Trade Commission and U.S. Department of Justice 2004 p.23).

The U.S. experience with airline regulation provides an excellent example. In order to develop air travel infrastructure, airline regulation required carriers to cross-subsidize unprofitable routes with profitable ones. Cross-subsidization appeared to contribute to infrastructure development in the early years of regulation, but eventually led to extraordinarily high costs (Morrison and Winston 1986). Consumer welfare and producer surplus improved markedly following deregulation (Winston 1998; Peltzman and Winston 2000). If subsidizing indigent care is a policy objective, the economically optimal public policy would be to directly subsidize any hospital for providing indigent care.²⁰ Protecting incumbent hospitals from competitive entry may be just as likely to

¹⁸ The poor performance of CON is attributed to four factors: the administrative burden associated with determining appropriateness of new investments, the potential for CON laws to create and maintain hospital cartels by erecting barriers to new hospital entrants, the susceptibility of the CON process to industry influence (e.g., Payton and Powsner 1980), and the potentially sub-optimal input allocation induced by the CON constraint on the use of capital inputs.

¹⁹ Some studies have found that CON programs can be used to enhance patient outcomes by concentrating services in high-volume facilities (e.g., Vaughan-Sarrazin et al. 2002). However, these studies are limited by the causality problem described in Section 3.4, and the lack of analysis of whether improvement in outcomes compensates for the net social welfare losses associated with barriers to market entry (Federal Trade Commission and U.S. Department of Justice 2004).

²⁰ One of the criticisms of specialty hospitals is that many do not provide 24-hour emergency services. But it is not clear whether any current means of funding emergency room services are optimal. From a societal perspective, it may be more economically

allow incumbent firms to maintain higher prices and facilitate slack in organizational processes, rather than permit them to fund additional indigent care.

A related concern is that specialty hospitals engage in unfair competition with general hospitals by treating only less severe and more profitable patients (i.e., cream skimming). As noted, there is some evidence that specialty hospitals, like their ambulatory surgery center predecessors, treat healthier patients with fewer comorbid conditions. However, from a policy perspective, treating healthier patients in less intensive settings is likely to improve patient welfare, given the extensive literature on the cost and quality benefits associated with triaging patients from inpatient to outpatient settings following the implementation of Medicare's PPS. Thus, the cream skimming issue, as others have observed, is predominantly a function of (1) variation in operating margins within DRG and (2) crude case-mix adjustments in current reimbursement rates. Case-mix adjustment methodology has improved dramatically in recent years, and CMS maintains the administrative data necessary for such adjustments (FitzHenry and Shultz 2000; Iezzoni 2003). Again, according to economic theory, establishing administered prices that are more closely aligned with average costs together with improvements in case-mix adjustment would be superior policy mechanisms compared to restrictions on market entry.

In sum, there are significant drawbacks to the current four-part strategy to encourage the provision of indigent care. Tax exemption should in theory be sufficient compensation for indigent care, particularly when combined with disproportionate share payments and charity care risk pools. However, there are no explicit mechanisms in place to control how hospitals allocate the proceeds from tax exemption.²¹ Internal cross-subsidization would not be sustainable in competitive markets; therefore, costly entry-barrier regulations must accompany cross-subsidization. Both of these policies are sub-optimal insofar as they result in net losses in social welfare. Losses in net social welfare are likely to exceed the value of indigent care delivered. Policies such as direct subsidies for indigent care and more accurate case mix adjustment of payments would likely result in overall gains in net social welfare.

5.1.1 Effects on General Hospital Profit Margins

Were it the case that specialty hospitals erode profits of general hospitals in the same market, we should observe lower or at least declining profit margins among general hospitals in markets where there is at least one specialty hospital. In order to further

efficient to fund and operate emergency rooms no differently than police and fire departments.

²¹ Two recent law suits filed against large hospital chains have challenged the extent to which hospitals have been operating in accordance with the implicit contracts (Taylor 2004; Davies 2004). The suits allege that acute care hospitals, particularly those granted non-profit status, have been failing in their implicit obligation to serve mostly through aggressive bad-debt collection processes and turning away consumers with outstanding balances due.

examine this issue, we statistically analyzed the extent to which profit margins of general hospitals are affected by the presence of one or more specialty hospitals in the market. We obtained Medicare Hospital Cost Report Data for 1997 through 2003 for all U.S. acute care hospitals. For each hospital in the dataset, county and metropolitan statistical area (MSA) market areas were identified and additional market-level data from the Bureau of Health Profession's Area Resource File were merged. Mean general hospital profit rates²² were calculated for all county and MSA market areas in the U.S.

The analytic approach was to estimate what economists refer to as a profit function—a mathematical expression of the likely relationship between profit margin, the dependent variable, and the factors expected to affect profit margin, referred to as covariates. We estimate a standard “ad hoc” profit function of the following basic linear form: $MARGIN_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 S_{it} + \alpha_3 P_{it} + \alpha_4 Z_{it} + \varepsilon_{it}$. In this expression, $MARGIN_{it}$ refers to the mean of the operating margins (profit rates) of general hospitals within the i^{th} county (or MSA) in year t . It is hypothesized that the mean area-level general hospital profit rate is a function of demand factors (D_{it}), supply factors (S_{it}), input prices (P_{it}), a vector of market area characteristics (Z_{it}), and an error term (ε_{it}) representing unexplained or unmeasured factors. The demand factors included in this model are per capita income, population density, the percent of the population at or below the poverty level, and the area unemployment rate. The latter two measures are included to capture the likely indigent care burden faced by general hospitals. Supply factors include output measures (inpatient days per population and outpatient visits per population) and the number of physicians per capita. Price measures include the mean area wage for hospital workers (from the U.S. Bureau of Labor Statistics) and the Medicare Part A (hospital) average adjusted price per capita (AAPCC).

The main variables of interest are the specialty hospital indicator variables and the measure of market competition. We constructed two variables to measure the presence of specialty hospitals, each of which was based on our survey of ASHA membership. The first is a simple indicator variable (SCP) that equals 1 if the market area has one or more specialty hospital (most markets have only one). For example, if specialty hospital X opened in 1999, then SCP equals zero in 1997 and 1998 and equals one thereafter. The second specialty hospital indicator is the total number of physicians admitting patients to the specialty care provider in the market area.

The other main variable of interest is a measure of market concentration. Although not an ideal measure of market concentration, a standard method of measuring market concentration is the Herfindahl-Hirschman Index (HHI). The HHI is calculated by summing the squares of each firm's market share in the county; that is, $HHI = \sum_i 100 * s_i^2$,

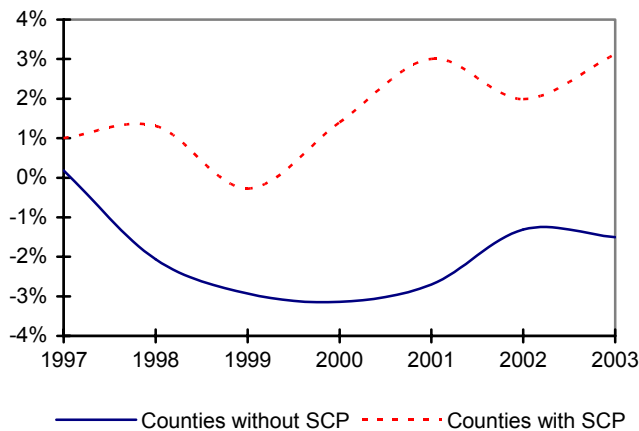
²² Profit rates were calculated as the difference between gross patient care revenue and total patient care costs (i.e., net income from patient care activities), divided by gross patient care revenue. Mean profit margins reported here are somewhat lower than those reported elsewhere, for two reasons: (1) for the purposes of this study profit margins are based on patient care revenue rather than total revenue; and (2) profit margins are aggregated to the county or MSA level.

where s denotes the market share of firm i . This method allows for firms with relatively large market share (e.g., 60 percent) to be more heavily weighted in the index. The HHI index equals 10,000 when an industry or market consists of a single seller. For the multivariate models of mean area profit rates, we assume the county or the MSA to be the relevant geographic market. In addition, since we are primarily interested in the effects of competition, we excluded from the analysis any county or MSA with only one acute care hospital (i.e., counties or MSAs with HHI = 10,000).

The model is specified as a fixed effects panel data regression, which is designed to estimate the impact of the covariates on profit rates both cross-sectionally (county or MSA) and over time (year). This allows for the effects of specialty hospital entry to accrue over time, effects that may not be observable looking only at a cross-sectional snapshot. The regression models are based on 933 counties and 299 MSAs.

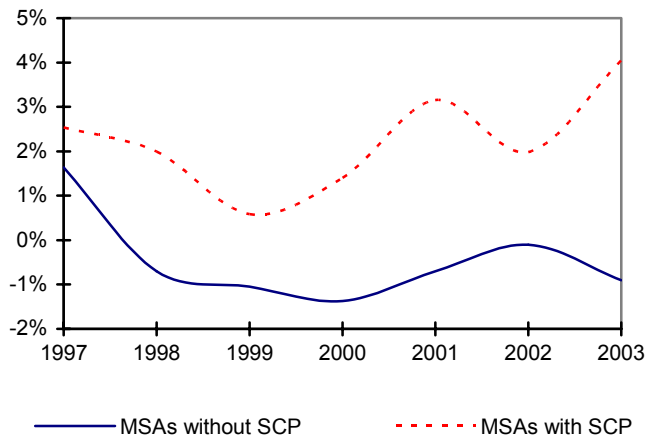
Descriptive trend comparisons of mean general hospital profit rates for counties and MSAs are shown in Figure 2 (counties) and Figure 3 (MSAs). The results for counties and MSAs are similar. Mean general hospital profit margins in counties with at least one specialty hospital were greater in all years of analysis. In the county-level analysis, the year 2001 and 2003 differences were statistically significant ($p \leq 0.05$). In the MSA-level analysis, the year 2001, 2002, and 2003 differences were statistically significant ($p \leq 0.05$).²³

Figure 2. Trends in General Hospital Profit Margins: U.S. Counties with Specialty Hospitals Compared to U.S. Counties Without Specialty Hospitals, 1997-2003



²³ In addition, MSA-level year 2000 differences were significant at $p \leq 0.10$.

Figure 3. Trends in General Hospital Profit Margins:
U.S. MSAs with Specialty Hospitals Compared to U.S.
MSAs Without Specialty Hospitals, 1997-2003



The regression results are consistent with the descriptive findings. The results of the regression model are shown on Table 3 (counties) and Table 4 (MSAs). For each geographic level of analysis, three models are reported: (1) specialty hospital variables are limited to the indicator variable SCP; (2) specialty hospital variables are limited to the total number of physicians admitting patients to the specialty care provider in the market area; and (3) including both specialty hospital indicator variables.

The estimated coefficients of the key variables have the anticipated sign.²⁴ The key variables of interest are (1) the HHI market concentration measure, (2) an indicator variable for the presence of a SCP, and (3) the number of MDs admitting patients to the specialty care provider. Consistent with economic theory, the models consistently showed that market concentration had a positive effect on profits; that is, as markets become more concentrated, profits increase. Interestingly, we also found that both of the specialty hospital variables were positive and significant in four of the six models, without regard to the geographic unit of analysis. This relationship was remarkably stable, evident in all model specifications tested.²⁵

The interpretation of this finding is that, contrary to the conjecture that entry by specialty hospitals erodes the overall operating profits of general hospitals, general hospitals residing in markets with at least one specialty hospital have higher profit margins than those that do not compete with specialty hospitals. These findings are also consistent

²⁴ Note that it is not uncommon in profit models for only a relatively small proportion of the variation in profit rates to be explained by the covariates; the best models often explain between 5 and 20 percent of the variance in profit rates. Our models explain less of the variation because the unit of analysis is the market area rather than the hospital.

²⁵ The analysis included several variants of the linear equation. For each model tested, the coefficients did not differ significantly from what is reported here.

with economic theory, which suggests that firms will enter markets in which extant profit margins are comparatively higher.

Table 3

Multivariable Profit Function Regression Models, Dependent Variable is Market Area (County) General Hospital Profit Margin, 1997-2003

Independent variable ¹	County		
	(1)	(2)	(3)
Per capita income	-0.00000143**	-0.00000137**	-0.00000143**
Population density	0.00000218	0.00000203	0.00000219
Inpatient beds per capita	3.47753300**	3.55058200**	3.46631100**
MDs per 1000 pop.	-0.00400460	-0.00421430	-0.00401000
Inpatient days per 1000 pop.	-0.00000524	-0.00000545	-0.00000522
Outpatient visit per capita	-0.00126660	-0.00136540	-0.00126630
Medicare Part A AAPCC	0.00024970**	0.00024770**	0.00024970**
Unemployment rate	-0.00065720	-0.00067840	-0.00065280
Poverty rate	0.00194070**	0.00193060**	0.00194040**
Annual wage (hospital staff)	0.00000017	0.00000023	0.00000017
HHI	0.00000336**	0.00000329**	0.00000338**
1= SCP present	0.03676190**	---	0.03464330**
MDs admitting to SCP	---	0.00032730**	0.00006750
Constant	-0.09486860	-0.09659210	-0.09488130
Number of observations	6424	6424	6424
F	5.34	4.64	4.94
Prob.>F	0.0000	0.0000	0.0000
Overall R-squared	0.0111	0.0125	0.0110

Sources: Survey of ASHA membership, Medicare HCRIS Cost reports, Area Resource File, and Bureau of Labor Statistics; see section 5.1.1 for description.

Notes: *Significant at $p \leq 0.10$ (t-test); **Significant at $p \leq 0.05$ (t-test)

Table 4

Multivariable Profit Function Regression Models, Dependent Variable is Market Area (MSA) General Hospital Profit Margin, 1997-2003

Independent variable ¹	MSA		
	(4)	(5)	(6)
Per capita income	-0.00000073	-0.00000057	-0.00000072
Population density	-0.00002250	-0.00002380	-0.00002260
Inpatient beds per capita	7.56830900*	7.51012900*	7.52111000*
MDs per 1000 pop.	-0.01176980	-0.01183570	-0.01174600
Inpatient days per 1000 pop.	0.00000699	0.00000783	0.00000686
Outpatient visit per capita	-0.00283480	-0.00287550	-0.00286490
Medicare Part A AAPCC	0.0003083**	0.00031420**	0.00030700**
Unemployment rate	-0.00269240	-0.00274240	-0.00261580
Poverty rate	-0.00127800	-0.00156110	-0.00131490
Annual wage (hospital staff)	-0.00000064	-0.00000061	-0.00000064
HHI	0.00000395*	0.00000360	0.00000399*
1= SCP present	0.0323107**	---	0.02809040**
MDs admitting to SCP	---	0.00032330**	0.00013120
Constant	-0.01532120	-0.01553810	-0.01475440
Number of observations	1465	1465	1465
F	4.00	3.39	3.75
Prob.>F	0.0000	0.0001	0.0000
Overall R-squared	0.0454	0.0415	0.0462

Sources: Survey of ASHA membership, Medicare HCRIS Cost reports, Area Resource File, and Bureau of Labor Statistics; see section 5.1.1 for description.

Notes: *Significant at $p \leq 0.10$ (t-test); **Significant at $p \leq 0.05$ (t-test)

5.2 Physician Self-Referral

The remaining policy issue is the potential effects of physician self-referral. The costs and benefits of physician self-referral has been debated for many years, mainly because the dominant physician payment mechanism in the U.S. has been and continues to be fee-for-service, which creates financial incentives for self-referral. In the case of specialty hospitals, the general argument against physician self-referral is that physician ownership may result in financial incentives to admit patients to the facilities in which they have an ownership stake. These arguments are to some extent based on research that has found that utilization of ancillary services is higher when an ownership relationship exists between referring physicians and ancillary services (Mitchell and Sass 1995; Lynk and Longley 2002; Kouri, Parsons, and Alpert 2002; Zientek 2003; O'Sullivan 2004). However, there are at least four important limitations to applying these arguments to acute care hospitals.

First, the vast majority of studies of higher utilization resulting from self-referral are based on physician ownership of *ancillary* services, rather than acute care hospitals. Mitchell and Sass (1995), in their frequently cited study of physician referral, failed to find higher utilization rates associated with self-referral to acute care hospitals. This lack of association has been one of the main reasons that the two phases of Stark anti-kickback legislation have exempted physician ownership of acute care hospitals (Stout and Warner 2003; Rohack 2004; O'Sullivan 2004). In addition, there is no direct evidence that the observed higher utilization rates resulting from self-referral to ancillary services represent inappropriate or unnecessary care (Kouri, Parsons, and Alpert 2002; Zientek 2003).

Second, there is no direct evidence that physician self-referral is motivated disproportionately by financial incentives. Physician self-referral is motivated by four factors: appropriateness, quality, efficiency, and financial returns. The relative magnitude of each of these incentives has been the subject of debate, but there is no direct evidence to suggest how, on average, physicians assign weights to each factor. Consistent with the empirical findings, anecdotal evidence suggests that physicians may disproportionately weight financial incentives when the referral is for standardized products or services (e.g., lab or pharmacy), and disproportionately weight appropriateness and quality when the referral is for more intensive procedures, such as surgery (Moore 2003).

Third, there is no evidence that self-referrals result in worse outcomes than other types of referral (Kouri, Parsons, and Alpert 2002; Zientek 2003). A likely reason for these findings is the endogeneity of three factors: physician quality, the likelihood of self-referral, and the quality of patient outcomes. In the case of specialty hospitals, site visits and trade press literature indicate that physician investors in specialty hospitals tend to be those who highly value efficiency in quality and cost dimensions. Thus, for many physician investors, self-referral is likely to represent the most optimal referral in terms of quality and cost.

Fourth, in the case of physician ownership of acute care facilities, it is likely that the magnitude of financial incentives is limited. The General Accounting Office (2003a) found that 30 percent of specialty hospitals surveyed had no physician investors. For half of the facilities with physician investors, the average individual physician ownership share was less than two percent. In the ASHA survey, virtually all physician investors owned only five percent or less (Table 2). Moreover, the entrepreneurial returns (i.e., the fraction of the facility fee considered operating margin) for any single case are likely to be substantially less than the professional fee charged by physicians. Given the order of magnitude difference between these two revenue streams, physician incentives are likely to be driven more by professional fees, which do not vary significantly by practice setting.²⁶ Indeed, in this context the potential for a surgeon to enhance his or her own productivity is a more likely source of financial incentive for self-referral to a specialty hospital. In other words, the primary financial motivation may be to enhance the return on investment for the surgeon's investment in "human capital" (associated with the number of procedures performed)²⁷ rather than any effort to assure a return on investment in the form of financial assets (associated with the overall financial performance of the hospital).

In terms of policy options, even if we were to assume that these limitations were not important, a more central question is whether creating barriers to market entry are the most appropriate means of addressing the issue. The net social welfare losses associated with barriers to market entry are likely to be greater than those attributable to physician referral incentives, particularly in light of the weakness of these incentives.

6. CONCLUDING REMARKS

In this study we have reviewed the theory and evidence on some of the key characteristics of specialty hospitals, including efficiency, demand, case mix, and quality. These findings were supported by observations from five specialty hospital site visits. We also conducted statistical analyses of the effects of specialty hospitals on the profit margins of general hospitals. The main findings of the study can be briefly summarized in the following three points.

First, there are economic advantages associated with specialization, due mainly to process redesign, learning, avoidance of diseconomies of scope, and focus on core competencies. Specialty hospitals appear to have equal or better patient outcomes compared to their general hospital counterparts. Hence, there is no evidence to suggest

²⁶ It should also be noted that high variation in utilization and referral patterns exist without respect to physician ownership. For example, Weinstein et al. (2004) recently observed significant variation in utilization patterns for major surgery for degenerative diseases of the hip, knee, and spine in several South Florida hospital referral regions where there are no physician-owned specialty hospitals.

²⁷ Refer to section 3.4

that specialty hospitals should be barred from entering acute inpatient care markets on the basis of efficiency or quality of care.

Second, there is no evidence, other than anecdotal, to suggest that general hospitals have been financially harmed by competition from specialty hospitals, or that such competition is undesirable from a societal perspective. Specialty hospitals compete with general hospitals in the same manner in which general hospitals compete with each other. Based on a longitudinal study of general hospital profit margins in markets with and without specialty hospitals, we find that profit margins of general hospitals have not been affected by the entry of specialty hospitals. Consistent with economic theory, the models consistently showed that the most important predictor of general hospital profitability was the extent of competition from other *general* hospitals in the same market area. General hospitals in less competitive markets (i.e., those with fewer competitors) had higher profits than general hospitals in less competitive markets. Contrary to the conjecture that entry by specialty hospitals erodes the overall operating profits of general hospitals, general hospitals residing in markets with at least one specialty hospital have higher profit margins than those that do not compete with specialty hospitals. These findings are also consistent with economic theory, which suggests that firms will enter markets in which extant profit margins are comparatively higher.

Third, though often cited as a significant policy concern, there is no evidence that physician self-referral is a problem in specialty hospitals. Physician self-referral is likely to play a relatively minor role in specialty hospitals, for four reasons: (1) the vast majority of studies of higher utilization resulting from self-referral are based on physician ownership of *ancillary* services, rather than acute care hospitals; (2) there is no direct evidence that physician self-referral is motivated disproportionately by financial incentives; (3) there is no evidence that self-referrals result in worse outcomes than other types of referral; and (4) in the case of physician ownership of acute care facilities, it is likely that the magnitude of financial incentives is limited.

APPENDIX A

2004 Survey of Specialty Hospitals

Instructions:

1. These results will be kept strictly confidential. Under no circumstances will the data leave the control of ASHA and its principal contracted researcher, John Schneider. Only aggregate data will be presented publicly (e.g., means and standard errors).
2. All responses, unless otherwise noted, should refer to your previous full fiscal year. If your facility has not been open for an entire fiscal year, indicate so at the beginning of the questionnaire. Also, unless otherwise specified, responses should refer to the main patient care facility.
3. Please answer each question as accurately as possible. In the event that it is not possible to answer a question, use the following codes: Unknown = **DK**, Refused = **RF**, Not applicable = **NA**. Before resorting to these codes try to at least provide a reasonable estimate.
4. For technical questions contact John Schneider at john-schneider@uiowa.edu or 319-331-2122.

Question	Response
1. Name of facility:	
2. Zip code (main patient care facility)	
3. Has your facility been open for at least one whole fiscal year? (1=Yes; 0=No)	
4. Beginning date of most recent full fiscal year (MM/DD/YYYY)	
Licensing & Accreditation	
5. Is your facility licensed in your state as an inpatient hospital? (1=Yes; 0=No)	
6. Accredited by Accreditation Association for Ambulatory Health Care? (1=Yes; 0=No)	
7. Accredited by Joint Commission on Accreditation of Health Care Organizations (JCAHO)? (1=Yes; 0=No)	
8. Other accrediting organizations (1=Yes; 0=No) Specify:	
History	
9. First calendar year in which facility was licensed as inpatient hospital	
10. First calendar year in which beds were added, if different from Q9	
Beds and Capacity	
11. Total bed capacity	
12. Number of staffed inpatient beds	
13. Number of operating rooms	
14. Number of intensive care beds	
15. Number of recovery beds (all stages)	
16. Do you maintain & staff an urgent/emergent care center? (1=Yes; 0=No)	
17. If Q16 = yes, how many hours per day is the care center staffed?	
Ownership Structure (Q21-Q24 sum to Q20)	
18. Total number of owners	
19. Total number of physician owners	

20. Total number of physician owners who admit ²⁸ at least 5 patients per year	
21. Number of physicians in Q20 with 0-1% ownership stake	
22. Number of physicians in Q20 with 2-5% ownership stake	
23. Number of physicians in Q20 with 6-9% ownership stake	
24. Number of physicians in Q20 with 10% or more ownership stake	
Volume and Case Load	
25. Number of inpatient discharges	
26. Number of inpatient days (overnight stay)	
27. Number of inpatient days (observation days)	
28. Number of surgeries (overnight stay)	
29. Number of outpatient surgeries (<u>no</u> overnight stay)	
Patient Care Revenue	
30. Total gross patient care revenue (inpatient + outpatient)	\$
31. Outpatient revenue as percent of total gross patient revenue (Q30)	%
Sources of Patient Revenue (Q32-Q35 sum to 100%)	
32. <u>Medicare</u> revenue as percent of gross patient revenue	%
33. <u>Medicaid</u> revenue as percent of gross patient revenue	%
34. <u>Commercial (private health plan) insurance</u> revenue as percent of gross patient revenue	%
35. <u>Other</u> revenue as percent of gross patient revenue	%
Charity Care	
36. If your state has a charity care risk pool, do you pay into it? (1=Yes; 0=No)	
37. If the answer to Q29 was yes, indicate annual amount paid into risk pool	\$
38. <u>Charity care</u> as a percentage of gross patient care revenue	%
Taxes Paid²⁹	
39. State income tax paid previous tax year	\$
40. Federal income tax paid previous tax year	\$
41. Property tax paid previous tax year	\$
Expenses and Income	
42. Total operating expenses	\$
43. Net income after all expenses but before taxes	\$
Nurse Staffing	

²⁸ Admitted for inpatient care

²⁹ All tax information should refer to the most recent full tax year. Facilities organized as partnerships typically allocate taxes to owners. In these cases please provide and estimate of the total tax liability for the entity for all owners combined.

44. Total number of full-time equivalent (FTE) RNs	
45. Average <u>patient to RN ratio</u> (e.g., for 3:1 write "3;" for 5:1 write "5") ³⁰	
Quality	
46. Do you employ a computerized physician order entry (CPOE) system? (1=Yes; 0=No)	
47. Do you employ an electronic medical record (EMR) system? (1=Yes; 0=No)	
48. Do you attempt to collect patient satisfaction data on all patients post-discharge? (1=Yes; 0=No)	
49. Percent of admitting physicians with admitting privileges at community / general hospitals in market area	%
50. Number of admitted inpatients transferred to community / general hospitals in market area	
51. Do you have a transfer arrangement with one or more community / general hospitals in market area? (1=Yes; 0=No)	
Competitors	
52. Number of <u>inpatient hospitals</u> in market area which you consider to be competitors	
53. Number of <u>outpatient surgery centers and clinics</u> in market area which you consider to be competitors	

³⁰ Patient to nurse ratios are expected to vary by stage of care (i.e., first and second stage recovery) and by shift. For this question, estimate an overall facility average; i.e., report the average number of patients per RN across all stages of care.

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