



ORIGINAL ARTICLE

Correlates of Perceived Competitive Advantage among Hospital Management: A Multilevel Analysis

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Purpose: As the hospital industry continues to undergo significant change and becomes an increasingly competitive environment, the concept of competitive advantage has received a considerable degree of attention in the healthcare literature. Using a multilevel modeling approach, this study evaluated the contributions of hospital characteristics and market competition on perceived competitive advantage of hospital managers in Taiwan.

Methods: Data for this study were mainly collected using a questionnaire that was mailed to the top executives of 432 accredited hospitals in Taiwan in 2009. Valid responses were obtained from 182 hospitals for an effective response rate of 42.1%.

Results: Respondents indicated relatively moderate assessment of perceived competitive advantage (mean = 3.5, standard deviation = 0.72, on a five-point Likert scale). There were no significant correlations between the group-level predictor (competition of local healthcare market) and the individual-level ones. Results of multilevel analysis to simultaneously examine the effects of individual-level (hospital characteristics; level 1) and group-level (competition of local healthcare market; level 2) predictors on perceived competitive advantage indicated that the predictors at hospital level had a statistically significant effect on respondents' perception of competitive advantage of their hospitals. Nonetheless, there was insignificant market competition variation in perceived competitive advantage among respondents.

Conclusion: We conducted a multilevel analysis that reflected the hierarchical structure of our data, where hospitals were nested within healthcare markets of different intensities of competition. Our results join a body of healthcare literature suggesting that hospital level is a significant predictor of hospital performance. However, we found no evidence of a strong relationship between the degree of local market competition and perceived competitive advantage of respondents. Taken together, the results of our empirical study shed light on some interesting issues regarding competitive advantage.

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1. Introduction

As the hospital industry continues to undergo significant change and becomes an increasingly competitive environment, the concept of competitive advantage has received a considerable degree of attention in the healthcare literature.¹ Briefly, competitive advantage occurs when an organization acquires or develops attributes and resources that allow it to outperform its competitors by offering customers greater value.² The ability of a hospital in a local market to develop strategic competencies which are relatively superior to its competing hospitals, and thus result in competitive advantage, is increasingly critical for its survival and growth in today's extremely turbulent healthcare environment.

The theme of sustainable competitive advantage of organizations has been the primary focus of the strategic management literature over the past few decades. For example, Barney³ and Wernerfelt⁴ propose the resource-based view; Hunt⁵ offers the resource advantage theory; while there is the market orientation discourse as well.^{6,7} In addition, Porter² proposes three generic strategies with which a firm can defend against external competing forces and gain a competitive advantage: (1) low cost; (2) differentiation; and (3) focus. Indeed, the increase in external environmental challenges has forced not only for-profit companies, but not-for-profit organizations (e.g., hospitals) to adopt a variety of strategies aimed at achieving competitive advantage to build viable and sustainable organizations.^{8–13}

Although numerous scholars have empirically scrutinized the topic of competitive advantage of hospitals, the impact of a nested data structure is relatively seldom tackled. It is quite reasonable that the perceived competitive advantage of hospital executives in

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the same healthcare market (i.e., encountering the same degree of rival intensity) is likely to be more closely correlated than that of their counterparts in different healthcare markets. Multiple observations of perceived competitive advantage are nested within a single healthcare market. The problem with such a nested data structure is that it violates the assumption of independent responses required by traditional statistical techniques such as ordinary least-squares multiple analysis, and it will lead to an inflation of the probability of a Type I error.¹⁴ Multilevel analysis (also termed multilevel modeling or hierarchical linear modeling) provides a technically robust framework to resolve the challenge when data have a hierarchical structure.

Multilevel analysis sophisticatedly integrates analyses at both the individual and the collective level by taking the nested structure of data (e.g., hospitals being grouped together in healthcare markets) into account. By using multilevel modeling, variances within healthcare markets and variances between markets are systematically disentangled; as a result, individual and aggregate predictors can be simultaneously accounted for. Moreover, standard errors are also more correctly calculated than traditional ordinary least-squares regression analysis with multilevel data and varying market sizes are taken into account.^{14–18}

Because of the importance of competitive advantage for hospital management, this research endeavored to uncover the factors that affect hospital executives' perception of competitive advantage of their hospitals. Specifically, the research question of the study is: "To what extent is perceived competitive advantage of hospital managers determined by hospital characteristics and to what extent by market competition?" The current study extends previous literature using multilevel modeling to account for the nested data structure that may mask a relationship between predicting factors and competitive advantage, as noted above. Addressing these issues has the potential to enrich understanding of the vital theme of competitive advantage of hospitals.

2. Methods

2.1. Study population

The main goals of the study were to probe perceived competitive advantage among hospital executives, and then look into the impacts of predicting variables on such perception. The study population was all 432 accredited hospitals (excluding psychiatric hospitals) in Taiwan (year 2007 data). Upper-level administrators of those hospitals (i.e., superintendent, vice-superintendent, or other upper-level executives) who were knowledgeable about their hospital policies and performances were explicitly asked to complete our survey questionnaire.

2.2. Survey procedure

In late February 2009, we mailed out self-administered questionnaires to the identified hospitals, accompanied by a covering letter to pinpoint the preferred respondents. A reminder letter, along with the original questionnaire, was sent out to nonresponders 3 weeks later. In the end, 182 valid questionnaires were used in the data analysis, representing a 42.1% effective response rate.

To examine the representativeness of the responding hospitals, we performed a Chi-square test on all predictive variables between participating hospitals and total sample hospitals, including competition of local healthcare market, hospital ownership and level, and teaching status. We detected significant differences in competition of local healthcare market ($\chi^2 = 12.60, p = 0.002$) and hospital ownership ($\chi^2 = 9.40, p = 0.009$) between participating hospitals and the study population.

2.3. Variable measurement

We developed the survey questionnaire based on a thorough review of the literature and consultations with experts. The questionnaire collected three sets of information: (1) Respondents' perception of competitive advantage of their hospitals – Regarding the outcome variable of the study, respondents were asked to evaluate on a five-point Likert-type scale with respect to five questionnaire items. A composite score was then calculated by averaging a respondent's responses to those five questionnaire items. The higher the score, the better the competitive advantage of the sample hospital is perceived by that respondent. A sample questionnaire item is: "The overall reputation of your hospital is relatively superior to your close competitors in the eyes of customers". (2) Hospital characteristics – There are two kinds of variables, which are hospital ownership (public, private and not-for-profit) and hospital level (medical center, regional hospital and district hospital). (3) Sociodemographic characteristics of respondents.

An important variable of interest for the present study is competition of the local healthcare market. While advocates of hospital market competition assert the important role played by competition when assessing costs, quality, efficiency or profits, the evidence in the literature is inconsistent.^{19–22} In this study, competition of the local healthcare market was measured by the Herfindahl–Hirschman Index (HHI), which is a commonly accepted measure of market concentration in the health services and health economics literature. The HHI is based on the market shares of all competitors in a market, and is calculated by squaring the market share of each firm competing in a market and then summing up the resulting numbers. A lower index indicates a less concentrated market, meaning it is more competitive. The HHI can range from a minimum of close to 0 (a perfectly competitive market) to a maximum of 10,000 points (a monopoly market). A market in which the HHI is below 1000 is regarded as unconcentrated, between 1000 and 1800 as moderately concentrated, and above 1800 as highly concentrated.²³ As indicated previously, for this study competition of the local healthcare market was measured by the HHI (calculated on the basis of total discharges), and grouped as a three-category classification: high degree of competition (HHI < 1000), moderate competition (1000 ≤ HHI ≤ 1800), and low competition (HHI > 1800). Information used to calculate the HHI was obtained from the Department of Health, Taiwan.

2.4. Validity and reliability of the survey instrument

The validity of the structured questionnaire was established by calculating a content validity index (CVI) with the assistance of five reputed academic experts and industry managers. They were asked to evaluate each item in the questionnaire for the extent to which it reflected the identified concept. The CVI was established at 0.80 for all questionnaire items used in the study.

The reliability of the questionnaire was evaluated using the test–retest reliability method. Ten respondents from the participating hospitals were purposively selected and given the same questionnaires 2 weeks apart. The test–retest reliabilities of all selected items were assessed by using the measure of intraclass correlation coefficient (ICC).²⁴ The values of ICC of the selected items ranged from 0.78 to 0.85 (all $p < 0.05$), indicating a satisfactory test–retest reliability of the questionnaire.

2.5. Statistical analysis

The data were first analyzed at the bivariate level. Next, a multilevel analysis was done to simultaneously examine the effects of group-level and individual-level predictors. As aforementioned, the main

Table 1 Characteristics of participating hospitals and total sample hospitals

Variables	Participating hospitals (n = 182)	Nonparticipating hospitals (n = 250)	Total sample hospitals (n = 432)	Mean (SD)	χ^2*	
	n (%)	n (%)	n (%)			
Competition of local healthcare market						
High	129 (70.9)	124 (49.5)	253 (58.6)		12.60 (p = 0.002)	
Medium	23 (12.6)	86 (34.5)	109 (25.2)			
Low	30 (16.5)	40 (16.0)	70 (16.2)			
Hospital ownership						
Public	45 (24.7)	18 (7.2)	63 (14.6)		9.40 (p = 0.009)	
Private	108 (59.3)	174 (69.6)	282 (65.3)			
Not-for-profit	29 (15.9)	58 (23.2)	87 (20.1)			
Hospital level						
Medical center	8 (4.4)	15 (6.0)	23 (5.3)		4.84 (p = 0.089)	
Regional hospital	48 (26.4)	32 (12.8)	80 (18.5)			
District hospital	126 (69.2)	203 (81.2)	329 (76.2)			
Teaching status						
Yes	104 (57.1)	137 (54.8)	241 (55.8)		0.23 (p = 0.628)	
No	78 (42.9)	113 (45.2)	191 (44.2)			
Perceived competitive advantage [†]				3.5 (0.72)		

SD = standard deviation.

* The Chi-square test was performed between participating hospitals and total sample hospitals with the aim of evaluating the representativeness of participating hospitals;

[†] The variable of *perceived competitive advantage*, was measured by a five-point Likert-type scale with respect to five questionnaire items. A composite score was then calculated by averaging a respondent's responses to those five questionnaire items. The higher the score, the better the competitive advantage of the sample hospital is perceived by that respondent.

research question of the study was to evaluate to what extent perceived competitive advantage was determined by hospital characteristics (level 1; the individual-level predictors including hospital level, hospital ownership and teaching status), and to what extent by competition of the local healthcare market (level 2; the group-level predictor). Hence, to reduce the nested effects of hospitals within markets, we performed multilevel analysis using SAS Proc Mixed (SAS System for Windows, Version 9.2, Cary, NC).

3. Results

Table 1 describes the characteristics of participating hospitals in the study. Of the 182 hospitals, most (70.9%) were located in a highly competitive healthcare market (HHI < 1000), with 16.5% in a low degree of competition category (HHI > 1800). More than half (59.3%) of the hospitals were private, while not-for-profit hospitals accounted for the fewest (15.9%). Many sample hospitals (69.2%) were district hospitals, and only eight medical centers (4.4%) responded to our survey. Meanwhile, more than half (57.1%) of the hospitals were teaching hospitals. As to the measure of perceived competitive advantage, respondents from the participating hospitals indicated relatively moderate assessment [mean = 3.5, standard deviation (SD) = 0.72, on a five-point Likert scale].

Table 2 provides the Spearman's rank correlation matrix for the group-level and individual-level predictors. It reveals a noteworthy relationship between the predicting variables of hospital level and teaching status ($r_s = 0.672$, $p < 0.01$). Although the statistical power of correlation analysis is not quite robust and correlation coefficients are only rough indicators, the presence of such a relationship underscores the importance of simultaneously taking into account

Table 2 Spearman's rank correlation coefficients among variables (n = 182)

	1	2	3	4
1. Competition of local healthcare market	–			
2. Hospital ownership	–0.048	–		
3. Hospital level	–0.106	0.043	–	
4. Teaching status	0.121	0.027	0.672 [†]	–

[†]p < 0.01 (two-sided).

predicting variables when conducting multivariate analyses. However, there were no significant correlations between the group-level predictor (competition of local healthcare market) and the individual-level ones.

As noted previously, the statistical modeling framework of the study anticipates that individual respondent perception of competitive advantage is partly dependent on the healthcare market to which they belong. Hence, this dependency in the response is modeled by partitioning the individual- and group-level sources of variation by utilizing multilevel modeling. Results of multilevel analysis to simultaneously examine the effects of individual-level (hospital characteristics; level 1) and group-level (competition of local healthcare market; level 2) predictors on perceived competitive advantage are summarized in Table 3. The predictor of hospital level had a statistically significant effect on respondents' perception of competitive advantage of their hospitals. Upper-level administrators of regional hospitals perceived better competitive advantage of their hospitals in comparison with their counterparts at district hospitals. Finally, there was insignificant market competition variation in perceived competitive advantage among respondents ($p = 0.857$).

4. Discussion

4.1. Main research findings

Taiwan's hospitals have been under steadily environmental pressure, mainly because of an evolutionary payment scheme undertaken by the Bureau of National Health Insurance. Therefore, it may be reasonable to assume that hospital executives should have a keen interest in what factors would have impact on a hospital's competitive advantage. This article reports the results of an exploratory analysis designed to identify correlates of perceived competitive advantage among hospital executives. Taken together, the results of our empirical study shed light on some interesting issues regarding perceived competitive advantage. We observed that, on the whole, the respondents held a modest assessment of their hospitals' competitive advantage (mean = 3.5 on a five-point Likert scale).

Table 3 Results of multilevel analysis of perceived competitive advantage

Parameters	Coefficient (SE)	95% CI
Fixed effects		
Intercept	3.38 (0.168)*	(3.04, 3.71)
Hospital ownership		
Public	-0.07 (0.167)	(-0.40, 0.26)
Private	0.19 (0.171)	(-0.14, 0.53)
Not-for-profit (reference)		
Hospital level		
Medical center	0.40 (0.281)	(-0.15, 0.95)
Regional hospital	0.31 (0.155) [†]	(0.01, 0.61)
District hospital (reference)		
Teaching status		
Yes (reference)		
No	-0.22 (0.151)	(-0.52, 0.07)
Competition of local healthcare market		
High	1.06 (0.485)	(-0.82, 1.37)
Medium	-0.81 (0.284)	(-1.21, 0.54)
Low (reference)		
Random effects [‡]		
Between-market variance (level 2)	0.01 (0.009)	(-0.02, 10.55)

Wald test of level 2 variance: $Z = 0.18$, $p = 0.857$.

Deviance(-2 log likelihood): 379.52.

CI = confidence interval; SE = standard error.;

* $p < 0.01$;

[†] $p < 0.05$;

[‡] Random effects are estimated through a restricted maximum likelihood procedure.

We conducted multilevel analysis reflecting the hierarchical structure of our data, where hospitals (level 1) were nested within healthcare markets of different intensities of competition (level 2). Hence, utilizing multilevel analysis allowed us to simultaneously estimate the effects of group-level and individual-level factors, accounting for nonindependence of observations within groups. One of the main findings is the significant role played by hospital level, a proxy of hospital size and capacities in the present investigation. Our results join a body of healthcare literature suggesting that hospital size is a significant predictor of hospital performance.^{1,25–28} Specifically, our data show that hospital executives of regional hospitals perceived better competitive advantage of their hospitals than their counterparts at district hospitals. A possible explanation for this finding is that regional hospitals have more available resources and superior competency to provide a variety of health services to attract patients than do district hospitals, and therefore hospital executives of regional hospitals would reasonably perceive a better competitive advantage of their hospitals.

Although the coefficient of medical center (0.40) was larger than that of regional hospital (0.31) in regard to the relationship of hospital level and perceived competitive advantage, the result was not significant. In fact, such a statistically insignificant result echoes some studies' findings that although larger hospitals perform better than smaller ones, so supporting the existence of economies of scale, such economies of scale arise for hospitals with around 100 beds and would become exhausted for larger hospitals.^{29–31}

With respect to the contribution of hospital ownership on perceived competitive advantage of hospital executives, the analytical result is not significant. A significant amount of literature has supported a link between organizational attributes (such as ownership status) and conduct and performance of hospitals.^{28–34} For example, for-profit hospitals tend to pursue more aggressive strategies, such as market development, than their counterparts. However, some scholars point out that economic forces have made the environment for the healthcare industry more competitive and turbulent; as a result, the distinctions of strategic behaviors and competencies between for-profit hospitals and not-for-profit

hospitals have blurred.^{35–38} Accordingly, our finding is not very startling.

Moreover, we detected the absence of a relationship between teaching status and perceived competitive advantage of hospital executives. Although Blumenthal and colleagues³⁹ declared teaching status to play a significant role with regard to competitive advantage of hospitals, our finding concurs with the conclusion of Douglas and Ryman.¹

Lastly, an intriguing finding of the study is that we found no evidence of a strong relationship between the degree of local market competition and perceived competitive advantage of respondents. Contradictory evidence exists regarding the impact of market competition in the hospital industry.^{1,40–44} For instance, the findings by Rivers and Asubonteng⁴³ as well as Douglas and Ryman¹ revealed that market competition was negatively associated with hospitals' cash flow margins. However, our result is in line with the finding by Dooley and colleagues⁴⁵ who detected no relationship between market competition and financial performance of hospitals. Further efforts are necessary to shed additional light on the mixed findings reported in the literature on market competition and competitive advantage of hospitals.

4.2. Limitations

This study has several limitations which provide direction for future research. First, our data on competitive advantage are perceptual in nature. Although perceptual measures are regularly utilized in the strategy research field,^{46–49} and prior research has revealed that they often demonstrate a certain degree of validity,^{50–52} we cannot rule out the possibility that our results are somehow confounded by perceptual filters. Therefore, the addition of objective or independently assessed indicators of competitive advantage would extend the analyses reported in the study, an important consideration for future research.

Second, to evaluate the representativeness of participating hospitals, we conducted Chi-square tests on all predictive variables between participating hospitals and total sample hospitals. We detected significant differences in competition of the local healthcare market and hospital ownership between participating hospitals and the study population, as aforementioned. In other words, the results indicated the representativeness of those responding hospitals was not established with respect to market competition and hospital ownership, and there is a likelihood that related statistics would be underestimated. Hence, it limits the generalizability of research findings in this study concerning the two predicting variables.

Third, because of various features among different healthcare systems, the generalizability of the present results to other settings awaits further examination. Finally, it ought to be borne in mind that this work focused primarily on answering research questions quantitatively and cross-sectionally. In our study, only a limited set of predicting variables (i.e., hospital ownership and level, teaching status, and degree of local healthcare market competition), not any implicit factors (e.g., organizational culture and core competencies) concerning competitive advantage were examined, and the data were obtained at a single point in time. Research should be extended to evaluate both implicit and explicit factors by using a longitudinal database to better understand the underlying mechanisms of the findings of the study.

Notwithstanding these limitations, the present study yields several insights on the subject of competitive advantage. Collectively, the findings of this empirical research improve our understanding of a set of factors that influence the perceived competitive advantage of hospital executives. Still, investigating other predicting variables in more detail will lead to better understanding of the important issue of competitive advantage.

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References

- Douglas TJ, Ryman JA. Understanding competitive advantage in the general hospital industry: evaluating strategic competencies. *Strategic Manage J* 2003;**24**:333–47.
- Porter ME. *Competitive advantage: creating and sustaining superior performance*. New York: The Free Press; 1985.
- Barney JB. Firm resources and sustained competitive advantage. *J Manage* 1991;**17**:99–120.
- Wernerfelt BA. resource-based view of the firm. *Strategic Manage J* 1984;**5**:171–80.
- Hunt SD. *A general theory of competition*. Thousand Oaks, CA: Sage Publications; 2000.
- Kohli AK, Jaworski BJ. Market orientation: the construct, research propositions and managerial implications. *J Marketing* 1990;**54**:1–18.
- Slater SF, Narver JC. Market orientation and the learning organization. *J Marketing* 1995;**59**:63–74.
- Dart R. Being “business-like” in a nonprofit organization: a grounded and inductive typology. *Nonprof Volunt Sec Q* 2004;**33**:290–310.
- Ferris JA, Graddy EA. Structural changes in the hospital industry, charity care, and the nonprofit role in health care. *Nonprof Volunt Sec Q* 1999;**28**:18–31.
- Forehand A. Mission and organizational performance in the healthcare industry. *J Healthcare Manage* 2000;**45**:267–77.
- Krug K, Weinberg CB. Mission, money, and merit: strategic decision making by nonprofit managers. *Nonprof Manage Leadersh* 2004;**14**:325–42.
- McDonald RE. An investigation of innovation in nonprofit organizations: the role of organizational mission. *Nonprof Volunt Sec Q* 2007;**36**:256–81.
- Weerawardena J, McDonald RE, Mort SG. Sustainability of nonprofit organizations: an empirical investigation. *J World Bus* 2010;**45**:346–56.
- Bryk AS, Raudenbush SW. *Hierarchical linear models: applications and data analysis methods*. Newbury Park, CA: Sage Publications; 1992.
- Draper D. Inference and hierarchical modeling in the social sciences. *J Educ Behav Stat* 1995;**20**:115–47.
- Duncan C, Jones K, Moon G. Context, composition and heterogeneity: using multilevel models in health research. *Soc Sci Med* 1998;**46**:97–117.
- Peugh JL. A practical guide to multilevel modeling. *J School Psychol* 2010;**48**:85–112.
- Snijders TAB, Bosker RJ. *Multilevel analysis: an introduction to basic and advanced multilevel modeling*. London: Sage Publications; 1999.
- Gapenski L, Vogel B, Langland-Orban B. The determinants of hospital profitability. *Hosp Health Service Admin* 1993;**38**:63–80.
- Kessler DP, Geppert JJ. The effects of competition on variation in the quality and cost of medical care. *J Econ Manage Strategy* 2005;**14**:575–89.
- Kessler DP, McClellan M. Is hospital competition socially wasteful? *Q J Econ* 2000;**115**:577–615.
- Scanlon DP, Swaminathan S, Lee W, Cherner M. Does competition improve health care quality? *Health Service Res* 2008;**43**:1931–50.
- Gaynor M, Vogt WB. Antitrust and competition in health care markets. In: Culyer AJ, Newhouse JP, editors. *Handbook of health economics*. Amsterdam: Elsevier Science; 2000. p. 1405–87.
- Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull* 1979;**86**:420–8.
- Ferrier GD, Valdmanis VG. Do mergers improve hospital productivity? *J Oper Res Soc* 2004;**55**:1071–80.
- Garcia-Lacalle J, Martin E. Rural vs urban hospital performance in a ‘competitive’ public health service. *Soc Sci Med* 2010;**71**:1131–40.
- Prior D. Efficiency and total quality management in health care organizations: a dynamic frontier approach. *Ann Oper Res* 2006;**145**:281–99.
- Renn SC, Schramm CJ, Watt JM, Derzon RA. The effects of ownership and system affiliation on the economic performance of hospitals. *Inquiry* 1985;**22**:219–36.
- Ahgren B. Is it better to be big? The reconfiguration of 21st century hospitals: responses to a hospital merger in Sweden. *Health Policy* 2008;**87**:92–9.
- Dranove D. Economies of scale in non-revenue producing cost centers: implications for hospital mergers. *J Health Econ* 1998;**17**:69–83.
- Lindrooth RC, Sassi A, Bazzoli GJ. The effect of urban hospitals closure on markets. *J Health Econ* 2003;**22**:691–712.
- Ginn GO, Young GL. Organizational and environmental determinants of hospital strategy. *Hosp Health Service Admin* 1992;**37**:291–302.
- McCue MJ, Clement JP, Luke RD. Strategic hospital alliances: do the type and market structure of strategic hospital alliances matter? *Med Care* 1999;**37**:1013–22.
- Trinh HQ, O’Connor SJ. The strategic behavior of U.S. rural hospitals: a longitudinal and path model examination. *Health Care Manage Rev* 2000;**25**:48–64.
- Clement JP, White KR, Valdmanis V. Charity care: do not-for-profits influence for-profits? *Med Care Res Rev* 2002;**59**:59–78.
- Ginn GO, Shen JJ, Moseley CB. Community benefit laws, hospital ownership, community orientation activities, and health promotion services. *Health Care Manage Rev* 2009;**34**:109–18.
- Potter S. A longitudinal analysis of the distinction between for-profit and not-for-profit hospitals in America. *J Health Soc Behav* 2001;**42**:17–44.
- Zhao M, Caretta HJ, Hurley RE. Sole hospital commitment to health promotion and disease prevention (HPDP) services: does ownership matter? *J Health Human Serv Admin* 2003;**26**:93–118.
- Blumenthal D, Campbell E, Weissman J. *Understanding the social missions of academic health centers*. New York: Report of the Commonwealth Fund Task Force on Academic Health Centers; 1997.
- Dranove D, Shanley M, Simon C. Is hospital competition wasteful? *RAND J Econ* 1992;**23**:247–62.
- Dranove D, White W. Recent theory and evidence on competition in hospital markets. *J Econ Manage Strategy* 1994;**3**:170–209.
- Manheim L, Bazzoli G, Sohn M. Local hospital competition in large metropolitan areas. *J Econ Manage Strategy* 1994;**3**:143–67.
- Rivers B, Asubonteng P. Hospital competition in major U.S. metropolitan areas: an empirical evidence. *J Socio-Econ* 1999;**28**:597–607.
- Robinson J, Luft H. Competition, regulation and hospital costs, 1982 to 1986. *J Am Med Assoc* 1988;**260**:2676–81.
- Dooley RS, Fowler DM, Miller A. The benefits of strategic homogeneity and strategic heterogeneity: theoretical and empirical evidence resolving past differences. *Strategic Manage J* 1996;**17**:293–305.
- Jaworski BJ, Kohli AK. Market orientation: antecedents and consequences. *J Marketing* 1993;**57**:53–70.
- Kumar K, Subramanian R, Yauger C. Examining the market orientation-performance relationship: a context-specific study. *J Manage* 1998;**24**:201–20.
- Lonial SC, Raju PS. The impact of environmental uncertainty on the market orientation-performance relationship: a study of the hospital industry. *J Econ Soc Res* 2001;**3**:5–27.
- Narver JC, Slater SF. The effect of market orientation on business profitability. *J Marketing* 1990;**54**:20–35.
- McCracken M, McIlwain TF, Fottler MD. Measuring organizational performance in the hospital industry: an exploratory comparison of objective and subjective methods. *Health Service Manage Res* 2001;**14**:211–9.
- Shortell SM, O’Brien JL, Carman JM, Foster RW, Hughes EF, Boerstler H, O’Connor EJ. Assessing the impact of continuous quality improvement/total quality management: concept versus implementation. *Health Service Res* 1995;**30**:377–401.
- Wall TD, Mitchie J, Patterson M, Wood SJ, Sheeran M, Clegg CW, West M. On the validity of subjective measures of company performance. *Personnel Psychol* 2004;**57**:95–118.