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Objective Functions and Compensation Structures in Nonprofit and For-Profit Organizations

Evidence from the "Mixed" Hospital Industry

Burcay Erus and Burton A. Weisbrod

4.1 Introduction

We examine the behavior of two forms of nonprofit organizations, religious nonprofit (RNP) and secular nonprofit (SNP), as well as that of private for-profit (FP) firms, when they coexist in a mixed industry—hospitals.[1] In an attempt to determine whether each type of nonprofit organization can be characterized by the same objective function as a for-profit

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1. There are many mixed industries, including higher education, day care, the arts, and museums, as well as hospitals and nursing homes. Behavior of organizations in such industries has been studied in a wide variety of dimensions. In nursing homes, for example, consumer complaints and regulatory violations have been found to differ not only at FP and governmental facilities, but also at RNPs and SNPs (Weisbrod and Schlesinger 1986); in the mentally handicapped facilities and nursing home industries, the use of waiting lists, rather than price to ration access, and the use of volunteer labor have been found to vary among institutional forms (Weisbrod 1988, 1998a; Kapur and Weisbrod 2000); and in day care centers, levels of staffing and consumer information have been found to vary across institutional forms (Mauser 1998). In general hospitals, charity care has been a particular focus of attention (Sloan 1998).

firm, but recognizing the difficulty of observing objective functions, we study the reflections of objective functions in employee compensation structures.

Specifically, we determine whether each form of nonprofit (NP) hospital provides incentives that differ from each other and from those of FP hospitals (a) in terms of "total" monetary compensation and its composition between base salary and performance-based bonus; (b) for each of fifteen types of jobs ranging from chief executive officer (CEO) to middle managers and technical workers; and (c) both cross-sectionally and over time in response to exogenous revenue constraints.

Our focus on relationships between employee reward structures and organization form has two justifications. One involves the difficulty of identifying the arguments in an organization's objective function. Measuring a private firm's "performance"—profit—relative to its presumed objective of profit maximization is not devoid of problems, as the recent Enron Corporation accounting practices made clear (Eichenwald 2002). Nevertheless, the problems of measurement and valuation of performance by FP firms pose considerably fewer challenges than is the case with the types of public-good outputs that are often identified with NP organizations—e.g., charity care (in hospitals), basic research (at universities), cultural preservation (at museums and zoos), and environmental protection. Thus, insofar as NPs pursue these hard-to-monitor, public-good goals rather than behaving as "for-profits-in-disguise" (Weisbrod 1988), they would utilize weaker reward structures (Holmstrom and Milgrom 1991), relying less on "performance"-based bonus compensation and more on base-salary compensation.

The second reason for focusing on employee compensation structures across institutional forms relates to understanding labor markets in which NPs operate. The question is whether NP and FP organizations compete in unified labor markets for particular types of labor, or whether they operate in distinct markets. On the labor supply side, employees could have preferences for working in one or another institutional form of organization for any given type of job.[2] On the demand side of the market, employers from various institutional forms could have preferences for distinct kinds of workers—i.e., in terms of worker-utility functions, which could influence the cost to employers of monitoring particular forms of performance.

The hypotheses we test relate particularly to the use of relatively strong, high-powered incentives in the form of performance-based bonuses, compared with weaker incentives in the form of base salary. The easier it is for

2. There is some evidence that such preference differentials do exist. In a survey of hospital volunteers (Wolf, Weisbrod, and Bird 1993), it was found that, while half of the respondents reported no preference as to volunteering to a FP or a NP hospital, the other half reported a preference for volunteering to a nonprofit.

the organization to monitor its agents' contribution to the organization mission, the stronger would be the incentives employed by any organization, regardless of ownership form or objectives. Thus, we test hypotheses that (a) NP organizations use weaker incentives than FPs when compensating their CEOs; (b) there are no differences—or, at most, smaller differences—in the incentive structures at FP and NP organizations for workers down the job ladder (middle managers and technical workers); and (c) exogenous tightening of fiscal constraints cause nonprofits to alter incentive structures to become more like for-profit firms. The hypotheses also distinguish between religious and secular nonprofits, for prior research has found systematic differences between them (see references cited in note 1, above).

The next section describes the theoretical setting and hypotheses. Empirical methodology is in section 4.3, followed by results in section 4.4. Section 4.5 interprets the full set of our findings and concludes.

4.2 Theoretic Setting and Hypotheses

Measurement and valuation of outputs are the fundamental challenges to all attempts to specify a NP organization objective function and then derive testable predictions. If an objective function includes outputs that are hard to measure and to value—as is the case with basic research (at universities), health care to the poor (at hospitals), or cultural preservation (at museums)—it will necessarily be difficult for the organization's trustees and directors to reward "performance" and for outside researchers to test for differential performance among FP, RNP, and SNP organizations.[3]

Thus, rather than attempting to observe differential outputs directly, we take an alternative tack. Making use of the theoretical relationship between any organization's objective function and the reward structures it utilizes to provide incentives for its employee-agents, we study the reflection of unobserved objectives in observable employee reward structures.[4]

3. For an interesting attempt to measure such output by FP and NP providers, though not to value it, see Schlesinger and Dorwart (1984), who examined psychiatric hospitals' provision of unpaid emergency psychiatric services by telephone. For a recent study of the "value" of hospital "charity care" at FP and NP hospitals see Nicholson et al. (2000). At the theoretic level, Hirth (1999), focusing on informational asymmetries, has shown that competition between FP and NP suppliers will lead FPs to emulate NPs if the latter are believed by consumers to be less opportunistic. However, that model does not deal with provision of public goods, such as charity care and medical research.

4. In recent years there has been increasing attention to managerial incentives in NP and FP hospitals. Roomkin and Weisbrod (1999), for example, examined data on CEO compensation and its decomposition into base salary and bonus and found significantly stronger incentives for CEOs at FP hospitals. Brickley and Van Horn (2002) found significant relationships between "financial performance" at nonprofit hospitals and both CEO turnover and compensation, but they did not have compensation information for FP hospitals and so could not compare the strength of incentives at the two institutional forms. Arnould, Bertrand, and Hallock (2000) focused on the effect on CEO incentives of market competition, finding that

If NPs were essentially disguised FP firms (Weisbrod 1988), they would want to offer the same strong rewards as private firms. Even if NPs pursued goals other than profit, they would use strong rewards if the desired outputs were easily monitored. The managerial rewards, while strong and in that sense like rewards by FP firms, would reward different variables.

We turn now to the theoretic structure underlying our empirical work. Consider an NP organization as a producer of two goods: a mission good (M) that is socially desirable but privately unprofitable and a revenue good (R) that finances the provision of M (James 1983; Schiff and Weisbrod 1991; Weisbrod 1998b, chap. 3).[5] If provision of M is difficult to measure and value, the firm would provide low-powered incentives, so as to discourage managers from focusing on profitable activities at the expense of mission outputs (Holmstrom and Milgrom 1991; Weisbrod 1988).

Profit from a revenue good, while necessary to maximize output of the mission good, is not sufficient. The organization must also be efficient in using the resources to maximize output of M subject to the available revenue. That efficiency, however, is more difficult to reward than is the generation of revenue. The optimal strength of managerial incentives thus requires a balancing of the incentive to generate revenue from R, which is relatively easily measured and rewarded, and the incentive to expend managerial effort on maximization of M, for given revenue, which can be difficult to measure. Under these conditions an NP would not fully exploit profit opportunities.

This two-good model of NP organization behavior, together with the assumptions that NPs are efficient in the pursuit of their mission good[6] but confront measurement problems with respect to the mission good, leads to some testable predictions. Assume that (a) for any organization, its CEO is the key agent through whom its mission is pursued; (b) the mission may differ among institutional forms; and (c) the mission may involve outputs that are difficult to monitor and reward ("type 2" attributes, contrasted with "type 1," easily-observed attributes; Weisbrod 1988). Assume further that (d) employees down the job ladder are expected to perform specific

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increased competition leads to closer ties between executive compensation and performance at nonprofit hospitals. Again, however, comparisons with FP hospitals were not made.

5. Under existing U.S. tax law, a NP organization's mission is not limited to unprofitable activities. The charging of patient fees by hospitals, tuition by universities, and admission fees by museums is generally treated as "substantially related" to the organization's tax-exempt mission. From a theoretic perspective, however, it is useful to think of such "user fees" as income from revenue goods, because the social rationale for granting tax-exempt status to NPs is, presumably, their provision of socially desirable outputs that private enterprise markets would not engage in.

6. The assumption that NP organizations are efficient in optimizing their objective functions subject to the constraints they face can be questioned. It has been argued that NP as well as governmental organizations are less efficient than private firms because their executives are not legally permitted to share in the profits that greater efficiency would bring (Alchian and Demsetz 1972).

duties that involve easily observable, type 1 dimensions of performance that differ little, if at all, across institutional forms. A janitor, for example, might well be expected to perform the same duties by a profit-maximizing firm or the most public-goods-oriented NP. Under these assumptions a model in which objective functions differ across institutional forms would imply that CEO reward structures would vary substantially across institutional forms. Going down the job ladder we expect to find that the differences across institutional forms disappear. Whether that occurs at the middle-management or technical-worker levels, or at lower levels, is not clear, but we expect relatively smaller differences among institutional forms than is found for CEOs. Accordingly, our first two hypotheses are:

HYPOTHESIS 1. *Nonprofit organizations offer their CEOs weaker incentives that are less tied to observable performance. Weak incentives are made operational in the form of payment of a base salary, while strong incentives are measured in two ways: by the CEO's contractual eligibility for a performance-based bonus and by the actual amount of bonus received, conditional on eligibility.*

HYPOTHESIS 2. *Lower-level workers—middle managers and technical workers—confront incentive structures that are more similar across institutional forms. That is, there are smaller differences, compared with CEOs, in base salaries, eligibility for a bonus, amount of bonus, conditional on eligibility for it, and total compensation (base salary plus bonus).*

In this model, managerial effort in an NP organization would be directed toward the mission in two ways: directly, in the production of M, the mission good, and indirectly, through the budget obtained from R, the revenue good. Thus, in response to a tightening of the revenue constraint, whether an NP would alter its CEO incentives would depend on the relative productivity of managerial effort in each activity. It would also depend on any aversion to commercial activity that would reduce the marginal attractiveness of the R good to the NP (on the effects of such aversion, see Schiff and Weisbrod 1991 and Segal and Weisbrod 1998). For example, charging impecunious clients for medical care and generating some revenue may be feasible, but may be regarded by the organization as inconsistent with its mission of both providing medical care and not impoverishing patients in the process (Steinberg and Weisbrod 2002).

For NP organizations the tightening of an exogenous revenue constraint thus poses a choice[7]: The NP can retain its weaker CEO incentives com-

7. This assumes that, in the case in which there are multiple R goods, a decrease in the profitability of one does not alter the profitability of the others. That is, for example, an exogenous reduction in revenue from patient fees, for example, may or may not alter an organization's optimal behavior in other revenue markets, such as donations or ancillary commercial activity.

pared with FP firms and, confronted by reduced revenue, contract its output of M. Alternatively, it can strengthen the CEO incentives in order to generate additional profit, assuming that there was some revenue source that had not been fully exploited.

No strong prediction can be made regarding how that choice will be made at an NP (relative to an FP) organization in response to an exogenous cut in revenue, even if, as we predicted above, the NP was operating at a less-than-profit-maximizing level in the R market. However, we suspect that the net effect of the forces luring the NP to seek increased revenue from the R good, and any aversion to such commercial activity, is to seek more revenue and, hence, to strengthen managerial rewards.[8] In the empirical section we test the proposition that both types of NP hospitals alter their pay structures so as to more closely approximate FPs. Thus:

Hypothesis 3. *When all forms of hospitals are confronted by a tightened revenue constraint—as might result from increased competition or HMO penetration—NP and FP organizations alter their CEO compensation structures differently, so that differences across institutional forms narrow.*[9]

Turning to lower-level employees, we predicted smaller systematic differences in reward structures across institutional forms (hypothesis 2), and now we hypothesize the following:

Hypothesis 4. *When all forms of hospitals are confronted by a tightened revenue constraint, compensation structures for middle management and technical workers at NP and FP organizations will become even more alike.*

With respect to all four hypotheses, we explore the differences not only between FPs and NPs, but also between FPs and each of the two types of NPs—religious and secular. There has been little research about the modeling or empirical behavior of RNP and SNP organizations (see, however, references cited in note 1, above, and also Ballou and Weisbrod 2003). Both forms are subject to the same legal constraints—e.g., the nondistribution constraint, eligibility for tax subsidies for charitable donations, and exemption from property and sales taxation. However, they may face other constraints that differ—e.g., donor preferences—or have different goals. By examining the labor reward structures in these two forms of NPs and their responses to a change in budget constraint, we can learn whether they should be modeled differently.

Before turning to empirical work, we should note that our expectation

8. The logic is symmetric. Thus, in respect to a loosening of fiscal constraints, we expect managerial reward structures at NPs to increasingly deviate from FPs. Our data do not cover such conditions. However, during the 1960s, for example, expansive governmental and private health care insurance programs were making it easier for NPs to pursue their missions.

9. Relatedly, Sloan (2000, 1142) argued that "As competition among hospitals increases, differences in behavior among hospitals with different ownership forms should narrow. . . . Private not-for-profit hospitals will have less latitude than previously to produce outputs they deem to be socially worthy."

that NPs use weaker rewards than FPs is consistent with a number of models. The one on which we have focused is that NPs' objective functions, by contrast with those of FP firms, encompass hard-to-monitor outputs, such as public goods. A second, also focusing on objective functions, is that NPs are pursuing profit maximization, despite the nondistribution constraint, but are inefficient at doing so, failing to provide optimal managerial incentives. A third model emphasizes the importance of the nondistribution constraint (NDC; Hansmann 1980) as a restriction on the use of strong incentives to reward profitability.[10] Thus, if an NP seeks to act like a profit maximizer, it would use weaker incentives than an FP, assuming the NDC is at least partially enforced.[11]

Some evidence to help in model identification can come from other findings. If our empirical evidence showed that compensation down the job ladder differs little across institutional forms, even though CEO compensation differs markedly, this would weaken the appeal of the inefficiency model, because inefficiency might be expected to appear at all levels, not just at the CEO level.

4.3 Data and Econometric Model

We utilize data from annual surveys administered by a proprietary compensation-consulting firm, the Hay Group, for the years 1992 and 1997.[12] The survey asks questions about compensation policies of hospitals for dozens of job titles. We utilize data on general nongovernmental hospitals, excluding specialty hospitals.

Although Hay Group contacted each hospital listed by the American Hospital Association (AHA), 3,732 and 3,593 general nongovernmental hospitals in 1992 and 1997, respectively, the number of respondents (908 and 857 in 1992 and 1997) constituted a rate of less than 25 percent. With respect to possible selection bias, it is clear that respondent hospitals are disproportionately for-profit, large, and in urban areas (that is, in metropolitan statistical areas [MSAs]). Not all respondent hospitals report compensation data for all jobs: We cannot distinguish, however, between cases in which a hospital does not have an employee with a specific job title and in which the hospital chooses not to provide the information.

10. It should be noted that NDC does not constrain the use of performance-based bonuses per se—only the rewarding of profit. NPs may legally utilize strong managerial reward structures to reward behavior other than profit.

11. Adjustment to NDC might be in form of offering job perquisites (see Glaeser and Shleifer 2001; Migue and Belanger 1974) or hiding incentives in the salary (see Brickley and Van Horn 2001; Arnould, Bertrand, and Hallock 2000).

12. The earliest year we could obtain is 1992. We also have data for years 1998 through 2000. We choose not to use these later years because of an extraneous exogenous shock to bonus policies of FP hospitals. After a fraud lawsuit against a major FP hospital chain, Columbia/HCA Health Corporation (now the Health Care Company), the chain ceased using bonuses to reward managers, in order to reduce the incentives to expand profit by using questionable business practices.

It is also the case that hospitals that responded in one of the years 1992 and 1997 did not necessarily respond in the other. With respect to data on CEOs, 731 hospitals reported in 1992 and 696 in 1997, but only 249 reported CEO information in both years (table 4.1 lists summary statistics for those hospitals). For CEOs we used a balanced sample, but for middle-management- and technician-level jobs the balanced samples were too small at for-profit hospitals to be useful, and so we use the full, unbalanced samples for each year. We analyze all middle-management and technician-level jobs (table 4.2) for which we had at least fifteen observations for each ownership type.

Hay data provide the following details about compensation structures for each job title: (a) base salary paid in the prior year; (b) whether the job is bonus eligible; and (c) the amount of bonus paid in the prior year. Regarding bonus eligibility, we treat a hospital as offering a bonus as part of its compensation package if the survey respondent either checked the bonus-eligible box or reported a positive amount of bonus paid.

For controls we utilize a number of variables characterizing each hospital and job title: (a) the complexity of each job with a given title—"Hay Points." Developed by Hay Consultants, job complexity at each hospital reflects specialized know how, problem solving, and accountability requirements of the job. This measure helps us account for possible differences in job definition and scope of responsibilities across hospitals. For jobs other than CEO, missing values led us to drop the Hay Points variable in order to obtain a useful sample size.

Control variables for other, arguably exogenous, characteristics of each hospital were obtained by matching the Hay Group survey data with data from the American Hospital Association (AHA) hospital surveys for the years 1992 and 1997. These include (b) the ownership type, (c) number of licensed beds, and (d) location, a dummy for whether the hospital is in an urban area (MSA), and other dummies for geographic region:[13] Northeast, South, and Midwest, with West being the omitted class. Summary statistics are in table 4.3 for CEOs; data for other job titles are available from the authors.

The effects of revenue constraints are analyzed using two measures: (a) Competition and (b) the HMO penetration rate. Greater competition and greater HMO penetration are hypothesized to bring intensified budgetary pressure on all hospitals in the county. Competition is measured by 1 – Herfindahl index (HHI). To construct the HHI from the AHA Hospi-

13. It could be argued that state dummies would be preferable to regional dummies insofar as states differ in their Medicaid policies and other hospital regulatory policies. Use of state dummies, however, is impractical because, in our sample of 248 hospitals, most states have only a few hospitals. Moreover, even with a larger sample, the usefulness of state dummies is somewhat questionable insofar as hospitals are near state borders (e.g., in New York, Chicago, and St. Louis), and have significant numbers of patients crossing the borders.

Table 4.1 **Summary Statistics (CEO)**

	1992				1997			
	For-Profit	Secular	Religious	All	For-Profit	Secular	Religious	All
Base salary	97.6	152.3	137.3	124.5	122.5	179.5	152.2	148.7
	(33.8)	(46.0)	(45.5)	(47.8)	(35.0)	(51.3)	(48.9)	(51.0)
Bonus (conditional on offering)	46.9	18.5	15.3	34.9	56.6	37.1	24.9	47.4
	(51.8)	(18.7)	(22.9)	(44.3)	(41.6)	(31.0)	(19.6)	(38.4)
Total compensation	143.7	162.4	146.9	151.0	176.0	203.6	161.7	183.7
	(72.0)	(51.5)	(57.3)	(630)	(66.3)	(68.4)	(57.0)	(67.3)
HMO penetration	0.09	0.14	0.15	0.12	0.21	0.26	0.21	0.23
	(0.11)	(0.12)	(0.12)	(0.12)	(0.16)	(0.17)	(0.13)	(0.16)
Competition	0.57	0.52	0.60	0.56	0.57	0.50	0.60	0.55
	(0.32)	(0.33)	(0.27)	(0.32)	(0.32)	(0.34)	(0.25)	(0.32)
Number of beds	164.4	295.2	250.1	226.9	164.7	290.4	223.6	221.4
	(100.6)	(181.3)	(154.1)	(155.5)	(96.1)	(169.8)	(127.7)	(144.2)
Job points	1253.5	1781.6	1508.7	1489.9	1310.4	1916.4	1590.5	1583.0
	(226.0)	(491.0)	(397.8)	(440.9)	(239.2)	(594.0)	(385.7)	(506.0)
MSA	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	(0.5)	(0.4)	(0.5)	(0.5)	(0.5)	(0.4)	(0.5)	(0.5)
South	0.8	0.3	0.2	0.5	0.8	0.3	0.2	0.5
	(0.4)	(0.4)	(0.4)	(0.5)	(0.4)	(0.5)	(0.4)	(0.5)
West	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Northeast	0.0	0.2	0.1	0.1	0.0	0.2	0.1	0.1
	0.0	(0.4)	(0.3)	(0.3)	0.0	(0.4)	(0.3)	(0.3)
N	110	88	43	242	110	88	43	242
N (offering bonus)	109	48	27	184	104	58	15	177

Notes: Standard errors are in parentheses. Total compensation, base salary, and bonus are in thousands of dollars. Competition = 1 – Herfindahl index (HHI). HMO penetration = HMO enrollment/population. Both competition and HMO enrollment are county based.

Table 4.2 Job Titles

	Title
CEO	
Middle-management level	Head of dietary and food services
	Head of housekeeping
	Head of imaging/radiology (nonmedical)
	Head of medical records
	Head of patient accounting/business office
	Head of purchasing/materials management
Technician level	Nurse supervisor
	EKG technician
	Nuclear medicine technologist
	Radiology technologist
	Respiratory therapist
	Staff dietitian
	Staff medical technologist
	Ultrasound technologist

tal Surveys we used the county as the market area and calculated market shares using number of beds.[14] The use of 1 – HHI, rather than HHI, is intended to simplify the interpretation. HMO penetration is calculated for each hospital as the percentage of the total population in the county that is enrolled in an HMO (see Wholey, Christianson, Engberg, and Bryce 1997 on how the data was constructed).

HMO penetration as an influence on hospital behavior is relevant under the realistic assumption that the price negotiated by a HMO with a hospital, which we do not observe, is lower than the price for non–HMO patients. It is likely, however, that non–HMO patients are not a homogeneous class. Preferred provider organization (PPO) members, Medicare patients, Medicaid patients, and private-pay patients (insured or uninsured) may all present a hospital with distinct prices. Thus, it would be ideal to have data not only on market penetration by HMOs, but also by each of these other market groups. By omitting them, we implicitly assume that their relative importance across hospital types is a constant.[15]

14. In the literature, a number of measures of market area have been used, including county (Lynk 1995), MSA (Dranove, Simon, and White 1998), and measures based on geographic flow of patients (Keeler, Melnick, and Zwanziger 1999). While we use county, we have also considered MSA for those hospitals located in MSAs (and county for others), and results did not change markedly. Significance levels and signs were unchanged, but magnitude of some coefficients was different. For example, the coefficient for religious hospitals in total compensation decreased from –58 to –34, and the coefficient for secular hospitals decreased from –34 to –24.

15. It should be noted that the importance of each of these market groups depends on their size in each "market area," not their importance in the actual patient structure of each specific hospital. Even if, for example, a hospital were found to have no HMO patients, the HMO penetration rate in the market might well affect the hospital's behavior.

Table 4.3 **CEO: Coefficients of Ownership Dummies and of Their Interactions with MSA, Competition, and HMO Penetration Measures, 1992 and 1997**

	Total Compensation		Base Salary		Bonus Amount[a]		Bonus Eligibility[b]	
	1992	1997	1992	1997	1992	1997	1992[c]	1997[c]
Religious (vs. for-profit)	*–58.3***	*–57.2***	*5.4*	–2.8	–85.7***	–57.8*	–11.0*	*–4.48****
	(17.8)	*(16.1)*	*(10.4)*	(11.5)	(27.6)	(31.2)	(6.2)	*(1.56)*
Secular (vs. for-profit)	*–34.7***	*–21.8*	*21.1***	14.8	–68.3***	–45.9***	–10.7*	*–1.2*
	(17.4)	*(16.7)*	*(10.1)*	(10.2)	(19.6)	(16.4)	(6.2)	*(1.2)*
MSA	10.3	4.4	–2.2	6.0	13.4	1.9	–1.4**	–0.099
	(20.6)	(14.1)	(7.6)	(6.3)	(13.0)	(10.5)	(0.6)	(0.53)
MSA · Religious	0.7	–9.1	13.2	–5.5	–3.1	–21.7		
	(22.1)	(21.2)	(11.3)	(11.4)	(25.1)	(17.4)		
MSA · Secular	–5.1	–9.2	8.7	–4.0	0.9	–7.9		
	(22.1)	(18.6)	(10.9)	(11.5)	(27.0)	(27.1)		
HMO penetration	–1.26	–0.59	–0.32	0.03	–1.12*	–0.83**	0.02	0.074*
	(0.79)	(0.51)	(0.35)	(0.23)	(0.61)	(0.33)	(0.08)	(0.05)
HMO · Religious	2.22**	1.87***	0.72	1.00*	2.06*	0.75	0.04	–0.058
	(1.11)	(0.69)	(0.61)	(0.54)	(1.09)	(0.95)	(0.09)	(0.06)
HMO · Secular	1.01	1.01	0.04	0.38	1.35	1.43**	0.01	–0.112**
	(0.77)	(0.64)	(0.43)	(0.34)	(0.90)	(0.55)	(0.09)	(0.05)
Competition	0.05	0.26	0.21*	0.09	–0.17	0.18	–0.08	–0.025
	(0.28)	(0.22)	(0.11)	(0.10)	(0.19)	(0.15)	(0.07)	(0.02)
Competition · Religious	0.32	–0.03	0.15	0.03	0.11	0.07	0.09	0.043
	(0.32)	(0.29)	(0.17)	(0.22)	(0.46)	(0.50)	(0.07)	(0.03)
Competition · Secular	0.15	–0.13	0.01	0.02	0.15	–0.22	0.08	0.029
	(0.32)	(0.27)	(0.16)	(0.16)	(0.31)	(0.24)	(0.07)	(0.02)
Beds	6.57	5.89	6.40*	4.36	–0.87	–0.61	0.24	0.251
	(5.45)	(4.93)	(3.66)	(3.89)	(5.64)	(4.06)	(0.25)	(0.27)

(*continued*)

Table 4.3 (continued)

	Total Compensation		Base Salary		Bonus Amount[a]		Bonus Eligibility[b]	
	1992	1997	1992	1997	1992	1997	1992[c]	1997[c]
Jobpoint	4.79**	7.15***	3.64***	5.55***	1.64	3.32**	–0.03	–0.04
	(1.87)	(1.69)	(1.19)	(1.13)	(2.12)	(1.36)	(0.09)	(0.08)
South	0.39	19.79*	12.02*	10.39	–12.83	–4.93	0.08	1.385***
	(12.62)	(11.53)	(6.83)	(6.67)	(11.37)	(10.01)	(0.50)	(0.52)
West	16.15	–1.29	9.85	0.28	10.64	–19.96*	0.38	2.286***
	(15.38)	(11.08)	(7.59)	(7.19)	(13.02)	(11.58)	(0.58)	0.67
Northeast	9.12	–3.26	16.17**	4.05	–13.41	–14.25	–0.27	–0.576
	(10.38)	(13.29)	(7.95)	(9.43)	(18.52)	(13.82)	(0.57)	0.58
Constant	72.19***	52.35***	23.13*	25.05**	45.48*	26.90	11.06*	1.861
	(17.9)	(19.3)	(12.8)	(11.7)	(23.3)	(16.3)	(6.3)	(1.31)
N	242	242	242	242	184	177	242	242
R^2	0.3	0.45	0.6	0.67	–839	–811	–90.8	–91
Expected salary for for-profit hospital[d]	153.0***	191.3***	110.6***	129***	41.134***	70.1***	6.697***	3.4***
	(16.5)	(13.0)	(6.9)	(6.2)	(11.0)	(8.6)	(2.1)	(1.2)

Notes: Standard errors in parentheses. Results are obtained by OLS for Total Compensation and Base Salary, tobit for Bonus Amount, and logit for Bonus Eligibility. Total Compensation, Base Salary, and Bonus Amount are in thousands. Italics indicate that religious and secular hospitals are significantly different from each other.

[a]For the amount of bonus there were twenty-eight and nineteen hospitals offering $0 bonus in 1992 and 1997, respectively.

[b]All results that are presented are logit coefficients rather than derivatives.

[c]We were unable to estimate a model with full interaction variables. Results are from one with no MSA interaction variables.

[d]At mean values of independent variables, except for MSA set equal to zero.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Cost containment pressures[16] also operate through other mechanisms, such as Medicare and Medicaid pricing, which we do not measure. To investigate whether hospitals of different ownership type reacted differently in terms of compensation structures to changes in financial constraints, we also compare the compensation structures over a time interval in which constraints were tightening, specifically from 1992 to 1997. We interpret changes in compensation structures as reflections of the effect of cost containment policies other than the HMO penetration and competition variables. Thus, we assume that there were no systematic changes across institutional forms that affect compensation structure other than those captured by the control variables.[17]

Specifically, we analyze determinants of four measures of compensation structure referred to above: (a) base salary, (b) bonus eligibility (whether a hospital offers a bonus or not), (c) amount of bonus (for those hospitals that offer a bonus), and (d) total compensation (base salary plus bonus). We have no data on other forms of compensation, such as stock options, expense accounts, and fringe benefits, which may also vary in systematic ways across institutional forms and over time. All monetary values are in 1992 dollars corrected with the Consumer Price Index–Health. We analyze institutional form differences in reward structures as a function of financial constraints at a given time, 1992, between 1992 and 1997, down the job ladder, and in response to changes in financial constraints, controlling for hospital size, job complexity, and location.

That is, for each of the years 1992 and 1997, we regress each of the four dependent variables—base salary, bonus eligibility, bonus payment, and total compensation—on ownership dummies (FP is the omitted class), competition, and HMO penetration measures, both independently and interactively with institutional form and other control variables. For the total compensation and base salary estimates we use ordinary least squares (OLS).[18] For the bonus eligibility equations, in which the dependent vari-

16. In the latter half of the 1980s and in the 1990s, "managed care," especially HMOs, expanded, as private and public insurers shifted emphasis from quality enhancement to cost containment. Lengths of hospital stays were cut by insurers. Patients were increasingly directed by insurers to hospitals with which discounted prices had been negotiated. Price competition intensified (Dranove, Shanley, and White 1993; Keeler, Melnick, and Zwanziger 1999). An important change affecting hospitals' revenues was the system of Medicare payments to hospitals. Beginning in late 1985 Medicare no longer reimbursed hospitals based on "actual costs" of treating a given patient. The Prospective Payment System, based on a set of 368 Diagnosis Related Groups of illnesses and therapies, each with a price attached, was increasingly adopted by other insurers in subsequent years. Hospitals were paid fixed prices for treating specific diseases, regardless of the actual cost incurred for a given patient, and downward pressure on those prices ensued.

17. William Vogt pointed out, however, that improvements in information technology might have helped NPs to better measure their mission-good performance, in which case they would use stronger incentives over time.

18. A Cook-Weisberg test (Stata command hettest) signals heteroscedasticity, which, while not causing OLS regression coefficients to be biased, does increase the estimated variances.

able is a dichotomous dummy indicating whether the hospital offers a bonus, we utilize a logit model. For the amount of bonus, conditional on the job being bonus-eligible at a specific hospital, we estimate a tobit model to account for the occurrence of bonuses of size zero (28 out of 184 and 19 out of 177 in 1992 and 1997, respectively).[19] That is, some CEOs whose jobs are bonus eligible do not receive a bonus. Since FP status is the omitted category, coefficients for SNP and RNP hospitals give the estimated differences between these types of hospitals and FP hospitals. Coefficients for the interaction of competition and HMO penetration with ownership dummies show how different types of ownership react to these financial constraints.

4.4 Results

In this section we first report findings for CEOs and then down the job ladder. For each job category we show the cross-sectional effects of institutional form on each of the four compensation structure variables. Estimates are then presented for the interactive effects of institutional forms with HMO penetration and competition. Finally, changes over time are estimated, by examining coefficients in both years and estimating the cross-institutional differences at low, high, and medium levels of HMO penetration and competition variables.

4.4.1 CEO

Institutional Differences—Base Case, 1992

Table 4.3 shows the estimated coefficients in 1992, our base year, for total compensation, base salary, amount of bonus, and bonus eligibility. The differential institutional effects of the HMO and competition variables are of particular interest. Table 4.3 also shows estimates for 1997, to capture the effects of changes over time. Table 4.4 shows predicted differences from FPs at each of several combinations of values of HMO penetration, competition, and MSA. With respect to bonus eligibility, we note that sample size limitations prevented estimation of equations with the interaction of MSA with each institutional form. Thus, we estimated equations without those interactions—that is, we did not estimate the differential effects of

Thus we use a Huber/White/Sandwich estimator for robust variances. In the tobit analyses, by contrast, coefficients are biased when heteroscedasticity exists. To deal with this we assume that the error term variance can be expressed as a function of hospital size, which we suspect to be the reason for heteroscedasticity, and then estimate the model accordingly.

19. Our estimation assumes that the data are reported accurately, i.e., those hospitals reporting no bonus payment did, indeed, pay no bonus to their CEOs. If that were not the case and a hospital reported zero dollars as bonus payment, even though it paid a positive amount of bonus, a two-part model that distinguishes between positive amounts and zeros would be more accurate.

Table 4.4 **Differences between Institutional Forms under Different Specifications of Competition, HMO Presence and MSA for CEOs**

							Bonus Eligibility[a]			
	Total Compensation		Base Salary		Bonus Amount		Logit Coefficient		Probability[b]	
HMO/Competition	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
	Religious versus for-profit, MSA = 0									
Low	–34.3**	–49.1***	14.9*	3.4	–71.1***	–51.3**	–7.3**	–3.0***	–0.5***	–0.6***
	(17.2)	(15.6)	(8.3)	(10.2)	(20.1)	(20.0)	(3.4)	(0.95)	(0.1)	(0.2)
Middle	–5.7	–31.0*	25.1***	14.0	–48.4**	–42.4**	–5.2**	–2.7***	–0.4***	–0.5***
	(18.9)	(16.0)	(8.8)	(10.0)	(20.9)	(18.3)	(2.2)	(0.70)	(0.1)	(0.1)
High	23.0	–12.9	35.3***	24.6	–25.6*	–33.5*	–3.0***	–2.5***	–0.2**	–0.4***
	(45.0)	(7.9)	(12.8)	(20.6)	(13.7)	(18.5)	(1.0)	(0.86)	(0.1)	(0.1)
	Religious versus for-profit, MSA = 1									
Low	–39.4**	–58.3***	23.7**	–0.6	–70.2***	–59.2**				
	(19.0)	(19.2)	(10.2)	(1.0)	(22.4)	(28.6)				
Middle	–10.7	–40.2**	33.8***	10.0	–47.4***	–50.3**				
	(14.6)	(16.5)	(8.3)	(9.7)	(15.9)	(19.5)				
High	18.0	–22.2**	44.0***	20.6	–24.7***	–41.3**				
	(63.5)	(10.7)	(11.5)	(24.1)	(9.0)	(16.9)				

(*continued*)

Table 4.4 (continued)

HMO/Competition	Total Compensation		Base Salary		Bonus Amount		Bonus Eligibility[a]			
							Logit Coefficient		Probability[b]	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
	Secular versus for-profit, MSA = 0									
Low	–23.7	–22.1	21.8**	17.6	–55.5***	–47.5***	–7.3**	–0.6	–0.5***	–0.1
	(18.2)	(18.0)	(9.7)	(10.8)	(17.7)	(16.3)	(3.4)	(0.83)	(0.1)	(0.1)
Middle	–10.6	–14.6	22.4**	21.8*	–39.1*	–37.6**	–5.5**	–1.1	–0.4***	–0.1
	(19.9)	(18.7)	(10.8)	(11.2)	(20.4)	(16.6)	(2.2)	(0.70)	(0.1)	(0.1)
High	2.5	–7.1	23.1*	26.1*	–22.6	–27.6**	–3.7***	–1.7**	–0.3***	–0.2**
	(8.0)	(9.1)	(12.9)	(15.7)	(14.8)	(12.9)	(1.0)	(0.84)	(0.1)	(0.1)
	Secular versus for-profit, MSA = 1									
Low	–23.0	–31.1	35.0***	12.1	–58.6***	–69.2***				
	(18.9)	(22.3)	(9.2)	(11.6)	(21.2)	(17.3)				
Middle	–9.9	–23.7	35.7***	16.3*	–42.1***	–59.3***				
	(14.6)	(18.8)	(7.4)	(9.8)	(15.2)	(13.7)				
High	3.2	–16.2	36.3***	20.5	–25.6**	–49.4***				
	(7.4)	(13.0)	(8.3)	(13.5)	(10.0)	(11.7)				

Notes: Low: HMO penetration = .05, competition = .4; Middle: HMO penetration = .15, competition = .6; High: HMO penetration = .25, competition = .8. Standard errors are in parentheses. Results are obtained from coefficients presented in table 4.3. Total Compensation, Base Salary, and Bonus Amount are in $ thousands.

[a]As we are unable to estimate the interaction of MSA and ownership forms, we present the estimates from equations without those interaction terms; thus, the bonus eligibility coefficients do not distinguish between MSA = 0 and MSA = 1.

[b]Differences in probabilities are calculated at the mean values of independent variables other than ownership dummies, HMO Penetration, and Competition.

***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

MSA location for RNPs and SNPs. In table 4.4, "middle" refers to the mean values (over both years) of competition (0.6) and HMO penetration (0.15), while "low" and "high" refer, respectively, to first and third quartile values of competition and HMO penetration (0.4 and 0.8 for competition and 0.05 and 0.25 for HMO penetration). For example, –34.3 on the top left cell of table 4.4 means that total compensation at a RNP in 1992 is estimated to be $34,300 less than at a FP when competition is 0.4, HMO penetration is 0.05, and the hospital is not in a MSA (This number is derived from table 4.3 as $-58.3 + 0 \cdot 0.7 + 5 \cdot 2.22 + 40 \cdot 0.32 = -34.3$). Also, note that for bonus eligibility we report differences both in logit coefficients and average probabilities.

In terms of institutional differences our overall results support hypothesis 1 that FP hospitals use higher-powered incentive mechanisms to reward CEOs compared with NP hospitals. As seen in table 4.4, regardless of which assumptions are used for HMO penetration and competition, the findings are robust: Bonus eligibility and bonus amount are significantly smaller and base salary is significantly higher at NPs than at FPs. For example, under the middle-level assumptions, RNP and SNP hospitals located in a non–MSA pay $22,000–$25,000 greater base salaries than FP hospitals, far smaller bonuses—$39,000–$48,000—conditional on offering a bonus, and total compensation that is lower, though not significantly, by $6,000–$10,000, while being significantly less likely to offer a bonus.

Do the two types of NPs behave alike? Table 4.3 shows coefficients for the RNP and SNP variables—independently and interactively—in *italics* when they differ significantly at the 10 percent level or better. In 1992, CEO total compensation is significantly lower at SNPs than at RNPs, by $23,000, and base salaries are also significantly lower, by about $16,000. However, with respect to interactive effects of each institutional form with the HMO penetration and competition variables, there are no significant differences between RNPs and SNPs.

Institutional Differences—Effects of Tightened Revenue Constraints

We move now to the effects of varied financial constraints cross-sectionally and over time. While we report findings on base salary and total compensation, we focus on strength of incentives as captured by bonus eligibility and amount of bonus. We find some evidence in 1992 that tighter fiscal constraints, proxied by competition and HMO penetration, led NPs to use stronger reward structures, more closely emulating FPs in terms of use of bonus compensation, and consistent with hypothesis 3 (hypotheses 2 and 4 will be considered below). Results are weaker for 1997 and mixed for changes across years, as cost containment pressures mounted.

From table 4.4 we see that in 1992 a shift from low levels of HMO penetration and competition to high levels is estimated to reduce the differences in bonus eligibility probabilities compared with FPs, by about half

(from –.5 to –.2 for RNPs and to –.3 for SNPs). Similarly, the differences in bonus amount, compared with FPs, fall by almost two thirds (from –$71,000 to –$26,000 for RNPs and from –$56,000 to –$23,000 for SNPs not in MSAs). In 1997, while table 4.4 again shows that the differences in the amount of bonus narrow as conditions change from the low to high assumptions, this narrowing is smaller absolutely and proportionately, than in 1992 (from –$51,000 to –$34,000 for RNPs and from –$48,000 to –$28,000 for SNPs not in MSAs). In terms of bonus eligibility, both types of NPs remain less likely than FPs to offer a bonus, but a SNP hospital differs more from a FP under the assumption of high (–.2) than low (–.1).

We turn now to comparison of compensation structures across years, in order to estimate the effects of cost containment policies that operate other than through HMO penetration and competition. Table 4.4 shows that between 1992 and 1997 differences between SNP and FP hospitals (lower two panels) in bonus amount increased in absolute value in some HMO/Competition cases (e.g., hospitals in MSAs), and decreased in others (e.g., low HMO/Competition in non–MSA hospitals). In terms of bonus eligibility, SNP hospitals consistently became more like their FP counterparts over the period. Differences in bonus eligibility became insignificant in 1997 under both low and middle conditions. RNPs, however, displayed a contrasting pattern (upper panel), becoming less like FPs in terms of bonus eligibility.

Finally, in order to capture the combined effects of changing coefficients over time and changing levels of HMO penetration, we consider the change from middle in 1992 to high in 1997. Between those years, HMO penetration nearly doubled, from 12 percent to 23 percent (table 4.1), which is close to the values of 15 percent and 25 percent that we use to define middle and high groups.[20] Table 4.4 shows that, under those assumptions, differences in the amount of bonus paid, conditional on bonus eligibility, between FPs and both types of NPs narrowed substantially for hospitals not in MSAs, from about $48,000 to $34,000 for RNPs and from about $39,000 to $28,000 for SNPs. For hospitals in MSAs, the narrowing also occurred for RNPs, from –$47,000 to –$41,000, but for SNPs the differential increased, from –$42,000 to –$49,000. For bonus eligibility, we find that as conditions change from middle to high—reflecting greater HMO penetration and competition—SNPs became more like FPs (the difference in bonus eligibility probability decreasing from –.4 to –.2), while for RNPs the differential probability remained the same.

4.4.2 Middle Management

Predicted differences between institutional forms at middle-level jobs are presented in table 4.5, analogous to table 4.4 (coefficients behind this

20. The growth was particularly great in the markets where FP hospitals were concentrated, where it increased from 9 percent to 21 percent (table 4.1). In 1992, FPs tended to be located in markets in which HMO penetration was substantially lower than was the case for NPs. By 1997, the gap narrowed, disappearing for the RNPs.

Table 4.5 **Differences between Institutional forms under Different Specifications of Competition, HMO Presence and MSA in Middle-Level Jobs**

	Total Compensation				Base Salary				Bonus Eligibility			
	1992		1997		1992		1997		1992		1997	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
					Secular versus for-profit							
Head of dietary services	9.1	–1.4	1.8	1.1	9.2	–0.9	2.5	1.6			–1.1	–0.6
	(6.6)	(2.2)	(2.0)	(2.4)	(8.6)	(2.2)	(2.3)	(2.3)			(3.4)	(0.6)
Head of housekeeping	1.5***	2.0	6.5	3.7	1.3***	1.7	7.1	3.5			–2.3	0.5
	(0.3)	(2.0)	(9.4)	(4.0)	(0.2)	(2.0)	(11.7)	(4.0)			(2.5)	(0.9)
Head of imaging	3.0**	–1.3	1.0**	2.2	3.2**	–0.9	2.6**	2.4			–1.8	–0.5
	(1.4)	(3.0)	(0.4)	(2.3)	(1.2)	(2.5)	(1.0)	(2.2)			(2.3)	(0.5)
Head of medical records	–0.6**	2.3	2.6***	5.0**	–0.4*	2.9	3.5***	5.0**			–1.5	–0.3
	(0.3)	(3.5)	(0.9)	(2.3)	(0.2)	(3.0)	(1.1)	(2.3)			(6.8)	(0.5)
Head of patient accounting	–1.5	–0.5	3.3	0.4	–1.8	–1.0	4.0	0.1			–0.8	–0.4
	(4.9)	(2.5)	(33.1)	(3.0)	(8.8)	(2.5)	(39.9)	(0.5)			(2.1)	(0.6)
Head of purchasing	5.9**	3.5	7.5***	6.4***	5.9*	3.9*	8.0***	6.2***			–1.0	–0.6
	(2.9)	(2.2)	(2.9)	(2.4)	(3.6)	(2.1)	(2.9)	(2.4)			(0.9)	(0.5)

(*continued*)

Table 4.5 (continued)

	Total Compensation				Base Salary				Bonus Eligibility			
	1992		1997		1992		1997		1992		1997	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
					Religious versus for-profit							
Head of dietary services	13.4	–2.0	3.8	0.6	13.9	–1.3	4.6	1.0			–2.1*	–1.1
	(10.0)	(2.6)	(5.6)	(2.7)	(16.1)	(2.6)	(4.6)	(2.5)			(1.2)	(0.7)
Head of housekeeping	1.5***	0.8	6.5	2.9	1.6***	0.4	7.3	2.6			–1.8	0.3
	(0.4)	(2.2)	(5.3)	(4.1)	(0.4)	(2.1)	(6.0)	(4.0)			(5.0)	(0.9)
Head of imaging	4.2**	–3.1	3.0*	3.0	4.6***	–2.3	4.5**	3.3			–2.3*	–1.0*
	(1.9)	(3.0)	(1.7)	(2.6)	(1.7)	(2.6)	(2.3)	(2.5)			(1.2)	(0.6)
Head of medical records	1.8*	1.3	4.0*	3.9	2.2	1.9	5.0*	3.7			–1.7	–0.4
	(1.0)	(3.7)	(2.4)	(2.6)	(1.5)	(3.1)	(2.8)	(2.5)			(1.4)	(0.6)
Head of patient accounting	0.4	–3.8	–0.6	–3.7	0.5	–3.8	–0.1	–3.2			–0.9*	–0.7
	(1.0)	(2.7)	(0.6)	(3.5)	(1.1)	(2.7)	(0.1)	(3.5)			(0.5)	(0.6)
Head of purchasing	5.6	2.2	4.8	6.7**	5.9	2.9	6.1	6.4**			–3.0**	–0.7
	(4.0)	(2.2)	(4.7)	(2.8)	(6.1)	(2.0)	(5.0)	(2.6)			(1.3)	(0.6)

Notes: Low: Competition = .4, HMO Penetration = .05, MSA = 0; High: Competition = .8, HMO Penetration = .25, MSA = 1. Results are obtained by OLS for Total Compensation and Base Salary, and by logit for Bonus Eligibility. Values are in $ thousands for Total Compensation and Base Salary; for Bonus Eligibility, logit coefficients are presented.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

table—analogous to table 4.3—are available from the authors). We present the differences under two sets of assumptions. The first evaluates the differences across institutional forms at the 25th percentiles of the distributions of competition and HMO penetration over the two years for the full samples (0.4 and 0.05 for competition and HMO penetration, respectively—corresponding to low in table 4.4) and considers a non–MSA hospital. The second specification evaluates the differences across institutional forms at the 75th percentile (0.8 for competition and 0.25 for HMO penetration—corresponding to high in table 4.4) and considers a MSA hospital.

With respect to hypothesis 2—that there are relatively smaller differences in compensation between NP and FP hospitals for lower-level jobs compared with CEOs—we find a mixed pattern. We are unable to estimate a full interaction model for bonus eligibility in 1992 and for amount of bonus in both years. Estimation without interactions indicated no significant difference between FPs and either type of NP (available from the authors). The estimates for bonus eligibility in 1997 (table 4.5) show a regular pattern, in that FPs are estimated to be more likely than NPs to offer a bonus in almost all job titles, even though most of the differences are insignificant. For total compensation and base salary, whether in 1992 or 1997 and whether the focus is SNPs or RNPs relative to FPs, there is evidence that significant differentials exist for some jobs but not for others.

4.4.3 Technician-Level Jobs

With respect to hypothesis 2, we expect to find results that are less mixed as we go further down the job ladder. Results for technician-level jobs are presented in table 4.6, which is similar to table 4.5. As very few hospitals offer bonuses for such jobs, we were unable to estimate either the bonus eligibility or bonus amount equations with interactions. A regression of bonus eligibility without interaction variables, however, showed no significant differences between FP and either type of NP hospital for any of the eight jobs regarding their tendency to offer bonuses. The fact that few hospitals of any form offer bonuses for technician jobs is consistent with hypothesis 2—that the use of strong rewards, as measured by the use of bonus compensation, does not differ across institutional forms as one moves down the job ladder.

Hypothesis 2, if correct, holds that the levels of total compensation will also not differ among institutional forms at technical-level jobs, nor will it differ for base salaries. Here the evidence is not clear. In 1992, with the low assumptions, table 4.6 shows that NPs and FPs do not differ in total compensation, as hypothesized, for four of eight at RNPs and for two of the eight jobs at SNPs. In terms of base salary, there are no significant differences for five of the eight jobs between either type of NP and the FPs.

Over time, from 1992 to 1997, table 4.6 shows that under the low assumptions many of the cross-form differences that were significant in 1992

Table 4.6 **Differences between Institutional Forms under Different Specifications of Competition, HMO Presence and MSA in Technician Level Jobs**

	Total Compensation				Base Salary			
	1992		1997		1992		1997	
	Low	High	Low	High	Low	High	Low	High
			Secular versus for-profit					
Nurse supervisor	–3.3***	2.1	3.2**	0.6	–3.3***	2.2	3.0**	0.7
	(0.8)	(1.7)	(1.3)	(1.4)	(0.8)	(1.6)	(1.2)	(1.3)
EKG technician	9.6	–1.4	5.1	0.3	9.7	–1.3	4.9	0.3
	(14.4)	(1.9)	(20.6)	(1.2)	(14.1)	(1.9)	(18.5)	(1.2)
Nuclear medical technician	–2.4*	–4.0***	0.3	–1.1	–2.1	–3.7	0.2	–1.1
	(1.4)	(1.0)	(0.2)	(0.9)	(1.3)	(0.9)	(0.1)	(0.9)
Radiology technologist	–9.0**	–0.9	–0.1***	–0.2	–8.8*	–0.8	–0.2***	–0.2
	(4.6)	(1.1)	(0.0)	(0.7)	(4.5)	(1.0)	(0.1)	(0.7)
Respiratory therapist	7.17*	–0.66	1.5*	–0.8	7.4	–0.5	1.4	–0.9
	(4.0)	(1.6)	(0.8)	(0.8)	(4.4)	(1.6)	(0.7)	(0.8)
Staff dietician	–0.1	–1.4	1.0	–0.7	0.2	–1.3	1.0	–0.7
	(0.3)	(1.1)	(2.5)	(0.9)	(0.5)	(1.1)	(2.6)	(0.9)
Staff medical technician	–2.7***	–1.7	1.4**	–0.8	–2.3	–1.5	1.4	–0.9
	(0.9)	(1.5)	(0.7)	(0.7)	(0.8)	(1.3)	(0.6)	(0.7)
Ultrasound technician	–11.9***	0.1	0.7	–0.1	–11.6**	0.3	0.6	–0.2
	(4.5)	(1.5)	(2.8)	(0.9)	(4.7)	(1.4)	(2.2)	(0.9)

				Religious versus for-profit				
Nurse supervisor	–4.1***	1.8	0.6*	0.4	–3.9***	1.8	0.6*	0.4
	(1.4)	(1.8)	(0.3)	(1.4)	(1.4)	(1.8)	(0.3)	(1.4)
EKG technician	5.7	–1.6	1.6	0.5	5.8	–1.4	1.6	0.5
	(7.7)	(2.0)	(2.0)	(1.3)	(7.7)	(2.0)	(2.2)	(1.3)
Nuclear medical technician	0.0	–3.9***	–1.5	–1.3	0.4	–3.6	–1.6	–1.3
	(0.0)	(1.2)	(3.5)	(1.0)	(0.3)	(1.1)	(4.2)	(1.0)
Radiology technologist	–9.7*	–1.8	–0.7	0.2	–9.5*	–1.6	–0.8	0.2
	(5.1)	(1.1)	(0.5)	(0.8)	(5.1)	(1.1)	(0.6)	(0.8)
Respiratory therapist	6.08	–0.76	–0.4	–1.5*	6.2	–0.6	–0.4	–1.5
	(4.7)	(1.6)	(2.7)	(0.8)	(5.1)	(1.6)	(2.5)	(0.8)
Staff dietician	0.5	–1.3	–2.1	–0.4	0.9	–1.2	–2.2	–0.4
	(3.8)	(1.2)	(4.5)	(1.0)	(2.5)	(1.2)	(4.1)	(1.0)
Staff medical technician	–2.7**	–2.2	0.1	–0.8	–2.3	–2.0	0.1	–0.9
	(1.1)	(1.5)	(0.1)	(0.8)	(0.9)	(1.4)	(0.1)	(0.8)
Ultrasound technician	–12.7**	–0.4	0.1	–0.4	–12.5**	–0.2	0.0	–0.4
	(5.5)	(1.5)	(0.2)	(1.0)	(5.8)	(1.4)	(0.1)	(1.1)

Notes: Low: Competition = .4, HMO Penetration = .05, MSA = 0; High: Competition = .8, HMO Penetration = .25, MSA = 1. Standard errors are in parentheses. Results are obtained by OLS for Total Compensation and Base Salary. Values are in $ thousands for Total Compensation and Base Salary.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

become insignificant—three of four at RNPs and two of six at SNPs. When we consider the high assumptions, with hospitals facing more competition and HMO penetration, there are almost no significant differences between different types of hospitals in either year, consistent with hypothesis 4.

4.5 Conclusion

We analyzed compensation structures for CEOs, as well as middle managers and technical workers, and changes in those structures in response to financial constraints at nonprofit—both religious and secular—and for-profit hospitals. While there are many reasons for wanting to understand patterns of compensation and their reaction to financial constraints, our principal motivation was to increase understanding of the objective functions of NP organizations that may or may not pursue goals other than profit maximization.

We hypothesized that compensation schemes and responses to exogenous fiscal stringency would differ across institutional forms, reflecting differential objective functions but only for top management, not for middle management or technical workers.

Overall, our findings are broadly consistent with the four hypotheses, but it is clear that there are forces other than we have considered that influence compensation structures and incentives. We find that NP and FP organizations act very differently in the labor markets for top management, CEOs. This is consistent with a model in which organizations of different institutional forms have different objective functions, with particular reference to outputs that are difficult to monitor and, hence, to reward. It is also consistent, however, with other models, including models in which NPs are less efficient or are legally constrained from adopting profit-sharing reward structures. Importantly, however, we noted that NPs are not constrained from linking compensation to performance in dimensions other than profit, such as the organization's provision of certain public goods or delivery of selected services to "deserving" consumers. The reason for using weaker rewards may well be the difficulty of measuring such outputs.

In lower-level jobs, differences in bonus and other compensation measures between NPs and FPs are far more limited. During the period, 1992 to 1997, a period of increasingly intense downward pressure on revenues at both FP and NP hospitals, we find that both types of NPs came to look somewhat more like FPs in terms of the use of performance-based bonus compensation.

Considering jointly our findings for top managers, middle managers, and technical workers, we judge that institutional form does convey information about organization objective functions. There is considerable evidence that is not consistent with the hypothesis that NP and FP hospitals are essentially "carbon copies."

Public policy does not distinguish between NP organizations that are re-

ligiously affiliated and those that are secular. Tax subsidies are offered to both without distinction. Antitrust law makes no distinction between the forms of NPs, applying equally to both. We find some but rather limited evidence that RNPs and SNPs behave differently.

Behavior of any organization reflects both its objective function and the constraints faced. More effective modeling of behavior of various forms of organizations in mixed industries requires better understanding of how to characterize both objective functions and constraints. This paper, utilizing employee compensation structures as indicators of organization goals, permits some limited inferences about the interplay of objective functions and constraints. Attention to other institutionally mixed industries, such as higher education, day care, the arts, and museums, as well as hospitals and nursing homes, is needed to facilitate generalizations about differential institutional behavior.

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