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Earnings Management Using Real Activities: Evidence from Nonprofit Hospitals

Leslie G. Eldenburg
The University of Arizona

Katherine A. Gunny
University of Colorado at Boulder

Kevin W. Hee
San Diego State University

Naomi Soderstrom
University of Colorado at Boulder

ABSTRACT: We extend the literature on earnings management through real operating decisions by providing insight into the types of expenditures (core versus noncore and operating versus non-operating activities) affected by earnings management. We partition a sample of California nonprofit hospitals based on their earnings management incentives. We find that expenditures on non-operating and non-revenue-generating activities appear to decrease in hospitals with incentives to engage in such behavior, while core patient care activities remain unchanged. We also find evidence of earnings management in non-core operational expenses. Second, we analyze real earnings management related to pay-for-performance incentives and find that hospitals with stronger performance incentives exhibit a significant incremental decrease in expenditures. Finally, we examine two different kinds of behavior to discriminate between earnings management and good operational decisions and provide weak evidence to support opportunism rather than good management. Together, these results provide evidence of the use of real operating decisions to manage earnings.

Keywords: *real operating decisions; earnings management; nonprofit organizations.*

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I. INTRODUCTION

Earnings management through manipulation of firms' accounting accruals has been extensively investigated by accounting researchers (e.g., Schipper 1989; Healy and Wahlen 1999). Earnings management that results from altering operating decisions (real activity management),[1] has also been analyzed, but due to data limitations, documentation has been limited to a few categories of expenditures (Baber et al. 1991; Dechow and Sloan 1991; Bushee 1998; Roychowdhury 2006; Cohen et al. 2008; Cohen et al. 2010). Our study employs a rich dataset from nonprofit hospitals to provide additional insight into this issue.

Analysis of nonprofit firms is valuable because, while for-profit firms focus on meeting or beating external benchmarks (e.g., analysts' forecasts) to increase stock price, nonprofit hospitals have incentives to increase income when it is below zero (for reasons similar to for-profit firms), but also to decrease income when it is high to avoid scrutiny from regulators and from third-party payors, that pressure hospitals for discounts when profits are large.[2] Leone and Van Horne (2005) examine accruals management in nonprofit hospitals. They use a benchmark of zero operating income to provide evidence that nonprofit hospital managers manipulate accruals to manage to this benchmark.

We analyze activities across 432 nonprofit hospital years in California from 1998–2003. These data include detailed expenditures[3] at the department level that allow us to identify whether managers are engaging in real activity management and also to determine specific areas where this occurs. We are thus able to gain insight into the extent to which managers alter firm operations to achieve specific income benchmarks. Given the absence of detailed data about operations in publicly traded companies, prior research has generally been limited to a small set of operational activities measured from the income statement (e.g., research and development expense, advertising expense). An exception is Cohen et al. (2010), who use a unique database of monthly advertising expenditures by media outlets and find that managers reduce advertising expenditures to avoid losses and earnings decreases. The authors point out that using expense to measure real activities manipulation is problematic because expenses can include the confounding influences of accruals management. Our detailed cost report data are free from the confounding influence of accruals manipulation.

We also extend this literature by considering real activities management stemming from compensation incentives. While there is a large literature showing widespread earnings management driven by corporate management's equity-based incentives (e.g., Bartov and Mohanram 2004; Bergstresser and Philippon 2006; Cheng and Warfield 2005; Burns and Kedia 2006; Efendi et al. 2007), in our nonprofit setting, there is no equity-based compensation, although incentive compensation can be based on firm financial performance.

It is important to separate compensation incentives from incentives to meet an earnings benchmark because these incentives can conflict with each other. For example, hospital managers who have incentives to manage earnings downward to avoid scrutiny can also face compensation incentives to manage earnings upward. To our knowledge, ours is the first study to incorporate compensation incentives into real activities management tests.

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[1] We use the term "real activity management" rather than "real earnings management" to emphasize managers changing the underlying economic activities of the firm, whereas accruals management reflects managers' choices of accounting methods used to represent those underlying activities.

[2] While managers of for-profit firms can have bonus-based incentives to manage earnings downward (Healy 1985), market incentives to increase earnings are likely to counter such incentives.

[3] Throughout the paper, we use the term "expenditure" rather than "expense" to emphasize that we are focusing on direct expenditures, absent any accruals.

We analyze both core and non-core activities, expecting that managers make decisions about non-core activities to manage income, but refrain from such activities in areas of core competence. We also attempt to understand whether this behavior is due to earnings management versus effective operational management. We examine whether the changes in expenditure reverse in future periods and how these decisions affect future performance.

Our results indicate that managers engage in real activity management to meet earnings benchmarks via both expenditure manipulation and asset management. We find evidence that nonprofit hospitals with pre-managed earnings slightly below zero appear to manage expenditures downward in non-operating activities (for example, curtailing spending to maintain or refurbish office space rented to physicians). Managers also decrease expenditures in non-revenue-generating areas such as general services, research and administration, and public relations, among others. However, we find little evidence of similar earnings management in core operating areas (such as inpatient care and ancillary medical services). When earnings are above the benchmark, managers appear to increase non-operating expenses, resulting in relatively lower net income. We also find that nonprofit hospitals with pre-managed earnings well above zero have relatively lower asset sales, resulting in comparatively lower levels of revenue and correspondingly lower levels of profit. Real activity management in response to compensation incentives occurs primarily through reduction of expenditures rather than asset management.

Results from our tests to discriminate earnings management from appropriate operational decisions provide evidence that many of the expenditure changes reverse in the next period, indicating that they were likely temporary decisions rather than long-term strategies. In addition, we find weak evidence that when nonprofit hospitals with incentives to decrease expenditures have met their benchmarks through changes in their non-operating and non-revenue-generating activities, their future net income is lower relative to remaining sample hospitals. However, we find no future decreases in net income when we base the analysis on management of operating expenditures. This is not surprising, given our lack of evidence of earnings management around operating expenditures.

This study contributes to the accounting research stream that investigates real activities manipulation. We extend the inquiry to the nonprofit setting and provide evidence of specific areas in which real activity management appears to be taking place. We also find evidence that managers not only manage income upward to achieve a positive net income, but also manage income downward to avoid regulatory scrutiny. We find that managers respond differentially to incentive-based compensation in their real earnings management activities. In addition, we find that real earnings management behavior has a negative effect on future operations. Our sensitivity analyses provide further support for our conjecture that the real activity management we identify is related to earnings management rather than operations management. To the extent that tax exemption is a tool that can be used to accomplish governmental purposes, regulators could be interested in the indirect costs associated with pressure on nonprofit hospitals to decrease reported profits.

Section II reviews the extant literature and develops hypotheses. Section III details our empirical tests, presents our results, and provides sensitivity analysis. In Section IV, we discuss the results and conclude.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Earnings management research has a long and rich history. Schipper (1989) provides an overview of the early earnings management literature with a focus on discretionary accruals. Schipper (1989) also describes settings in which managers make operating decisions that affect

earnings positively. A more recent stream examines real activity management in for-profit firms with a focus on manipulation of research and development expenditures (Baber et al. 1991; Dechow and Sloan 1991; Bushee 1998). Roychowdhury (2006) finds that firms reporting small positive earnings use techniques such as price discounts (to increase sales), overproduction (to spread fixed costs over more units, thus reducing COGS), and reduction of discretionary expenses to avoid reporting annual losses and negative changes in earnings. Gunny (2010) finds that firms use real activities manipulation to report small positive earnings (or small changes in earnings); however, these firms have relatively higher subsequent performance consistent with managers attaining benefits that allow better future performance or signaling. The results in Bartov (1993) suggest that managers sell fixed assets to avoid reporting negative earnings and incurring debt covenant violations. Herrmann et al. (2003) investigate Japanese managers' use of income from asset sales to manage earnings. They find that firms increase (decrease) earnings through sales of fixed assets and marketable securities when current operating income falls below (above) management's forecast of operating income.

With a focus on reported earnings, Graham et al. (2005) survey 401 financial executives regarding factors that affect their decisions about measurement of financial performance. Results of the survey suggest that accounting earnings benchmarks are more important than cash flows and managers want to meet or beat these benchmarks because they are concerned about subsequent effects on stock price, their careers, and any benefits to external reputation. A majority of respondents preferred smooth earnings patterns, were willing to sacrifice economic value for smooth earnings, and preferred to manage earnings through real actions as opposed to accounting actions. Most managers in the survey reported they would also avoid initiating a positive net present value project if the current quarter's consensus earnings forecast would be missed.

The survey evidence in Graham et al. (2005) suggests that executives are willing to manage several types of expenditures such as research and development, advertising, travel, and maintenance. However, prior investigation of real activity management has focused primarily on opportunistic reductions in research and development expenditures—most likely because research and development expense is usually disclosed separately in the financial statements of publicly traded companies, whereas expenditures on advertising and travel are aggregated in selling, general, and administrative expense.

Few researchers have examined earnings management in nonprofit organizations. Leone and Van Horn (2005) test for the existence of earnings management by examining both discretionary accounting adjustments (accruals) and discretionary expenditures on charity care in a sample of U.S. nonprofit hospitals. With regard to accruals, they find similar patterns of earnings management in both nonprofit and for-profit institutions. They also find that charity care expenditures are positively correlated with current income (excluding current year changes in charity care expenditures), which suggests real earnings management behavior.

Management toward an Earnings Benchmark

Nonprofit hospitals include those governed by universities, communities, and religious organizations. Examples include Scripps Healthcare and Catholic Healthcare West. Mission statements for nonprofit hospitals often articulate social objectives. Thus, unlike for-profit hospitals, profit is not the only (or perhaps even the primary) objective for hospital managers. However, nonprofit hospitals and their sponsoring charities are self-sustaining and cannot rely on government subsidies for operations. In addition, for the most part, donor support is too limited to fund ongoing operations. Revenues from operations fund these costs, so profit is an important part of their overall objective function. If nonprofit hospitals incur losses, then their managers have similar pressures as for-profit managers, i.e., a need to return to profitability.

In response to these incentives to focus on financial performance, we expect nonprofit hospital managers to manage accounting performance to achieve earnings benchmarks. We examine real activity management rather than accruals management, which was the primary focus of Leone and Van Horn (2005). Managers could prefer real activity management because accruals management takes place at the end of the fiscal year and managers face uncertainty about the accounting treatments that auditors will allow. In contrast, managers have a great deal of control over expenditure decisions and the timing of asset sales.

For earnings management toward a benchmark to occur, at some point during the period, a manager must realize that accounting performance will miss the benchmark. The manager could then manage discretionary accruals or change some real activity, resulting in a boost to (or decrease in) accounting performance for that period.[4]

For real activity management to affect accounting performance in a manner similar to accruals management, the real activity must have two characteristics. First, such accounting-performance-enhancing changes must be implementable in the short term. This means that activities such as reengineering operations to reduce cost would not constitute real activity management—these types of activities take time to design and implement and would simply be a part of good management. Second, the impact on accounting performance must be immediate. For example, changing collection policies is relatively simple and quickly implemented, but the impact on accounting performance would not occur in the short term. Thus, management of this activity might be part of an overall management strategy, but is unlikely to be used to manage period-end accounting performance.

We examine activities in which decisions can be quickly implemented and will rapidly affect accounting performance. We expect the greatest amount of real earnings management to be associated with non-revenue-generating and non-operating activities, because most revenue-generating activities within hospitals (such as patient room and board functions and diagnostic tests) include a large portion of fixed costs that might be difficult to manage. Another consideration is that revenue-generating activities are part of the hospital's core services; any reduction could have quality (and therefore reputation) implications. For example, one way to reduce nursing cost would be to substitute cheaper, lesser-skilled licensed vocational nurses for more expensive, highly skilled registered nurses. While this provides cost savings in the short term, there is a potential for reducing the quality of care, with concomitant long-term increases in cost or losses in revenues.

Non-revenue-generating activities are part of the hospital's overall operations, but are not directly related to patient care efforts. Changes in these activities are less likely to negatively impact the quality of patient care and are better candidates for reductions. In addition, many of them are somewhat lumpy and can be reduced in the short term. For example, advertising expenditures could be cut back or postponed until the following period. Governing board expenditures such as meeting costs and hospital-related activities such as travel and fees paid for special seminars could be reduced fairly easily. Non-operating activities include retail operations such as renting office space to physicians and other clinical personnel, operating a nearby hotel for patient families, and other activities that are not directly related to the nonprofit mission of providing patient care. Expenditures to maintain the office and hotel buildings, such as painting and refurbishing, can easily be deferred when hospital operating income is likely to fall below the benchmark.

While we expect less real earnings management in operating expenditures overall, departments associated with ambulatory (outpatient) and ancillary (e.g., radiology, therapy clinics, blood bank) services are less central to the hospital's core mission and have fewer fixed costs. Thus, if we find

[4] Unlike real activity management, accrual management can occur after year-end, but prior to release of accounting reports.

evidence of real earnings management in operating expenditures, it is more likely to occur in ambulatory and ancillary, rather than daily hospital services departments.

In addition to expenditure reduction, accounting performance can be boosted by increasing revenues through the sale of assets. As long as the asset is not directly related to core activities, such sales can increase accounting performance without compromising quality. To summarize this discussion, we hypothesize:

H1a: When nonprofit organizations' accounting performance is likely to be below benchmark, managers will decrease spending on non-operating and non-revenue-generating activities.

H1b: When nonprofit organizations' accounting performance is likely to be below benchmark, decreases in spending for operating activities tend to occur more frequently in ambulatory and ancillary expenditures than in daily hospital services expenditures.

H1c: When nonprofit organizations' accounting performance is likely to be below benchmark, managers will increase asset sales that result in net gains.

Relative to for-profit organizations, nonprofits have strong incentives to moderate their profits. Highly profitable nonprofit hospitals come under a great deal of scrutiny. The media targets specific hospitals when their profits are excessive. For example, the *Wall Street Journal* featured a front-page article about Baptist Hospital in Nashville, Tennessee entitled, "Really Operating: Nonprofit Hospitals Sometimes are that in Little but Name." The article took the hospital to task for the size of its profits ($20 million) in addition to a number of other excesses (Langley 1997). Political scrutiny also focuses on nonprofit hospitals and healthcare organizations with large profits. During the time period of our study, pressure about tax-exempt status was applied at all levels: federal, state, and county. For example, several Utah assessors took a healthcare system with 22 hospitals to court in 1994 over their tax-exempt status because the hospitals were not providing enough charity care. Two counties in Utah revisited the issue with the same hospital system in 2001, again citing problems with the level of community benefits (Galloro 2003). The IRS also revoked the tax-exempt status of the six-hospital St. David's Health Care System in Austin, Texas in 2000 (Anonymous 2003). In Galloro (2003, 49), James Bently, the American Hospital Association's senior vice president of strategic policy planning, is quoted as stating that tax exemption is "always being looked at someplace ... Attention waxes and wanes, but it isn't out of the ordinary."

While inviting regulatory scrutiny (at all levels of government), high profits can also alienate donors and conflict with aspects of the hospital's mission (i.e., to provide community benefit such as charity care or high-quality care at low prices). High profits also invite third-party payors to negotiate for increased discounts.

Hospital managers can reduce scrutiny by lowering income. This could be accomplished by increasing some types of expenditures, but only when income is potentially high. Increasing one-time expenditures would be relatively straightforward for non-revenue-generating activities, such as those for public relations and the governing board. For example, advertising could be increased and board retreats could be scheduled at resort areas. For non-operating activities, office space rented to physicians could be remodeled or refurbished to increase expenditures. Finally, increasing expenditures for operating activities would likely increase the quality of hospital core services.

Hospital managers could also lower current income by deferring asset sales that result in gains. While such situations would not explicitly reduce current income in the same fashion as increasing expenditures, the net effect would be to lower income relative to what it would be with the asset sales. In summary, we expect that nonprofit hospital managers with high levels of accounting performance will manage real activities to reduce performance, thereby reducing the risk of additional scrutiny.

H2a: When nonprofit organizations' accounting performance is likely to be above benchmark, managers will increase spending on operating, non-operating, and non-revenue-generating activities.

H2b: When nonprofit organizations' accounting performance is likely to be above benchmark, managers will decrease asset sales that would result in gains.[5]

Management Related to Pay-for-Performance (P4P) Incentives

A number of studies suggest that financial performance incentives in for-profit and nonprofit hospitals are similar. For example, Brickley and Van Horn (2002) examine data from nonprofit and for-profit hospitals from 1991 to 1995, finding that CEO turnover and compensation are significantly related to financial performance (measured as return on assets). They provide evidence that the turnover/performance relation in nonprofit hospitals is stronger than in for-profit hospitals and other for-profit corporations. In a similar study, Eldenburg et al. (2004) use California hospital data from 1980 through 1996 to show that both board and CEO turnover are related to poor financial performance in for-profit and nonprofit hospitals.

Nonprofit hospitals increasingly use performance-based compensation contracts that encourage managers to improve profitability (i.e., enhance revenues and reduce costs) and better align hospital and managerial incentives (Lambert and Larcker 1995; Eldenburg and Krishnan 2008; Eldenburg et al. 2009). Leone and Van Horn (2005) suggest that, with increases in incentive contracting, nonprofit managers begin to act more like managers of for-profit hospitals. Glaeser (2004) suggests that the behavior of nonprofit and for-profit hospitals converges when commercialism increases in nonprofits. Such an increase in commercialism can occur in response to declining rents and a rise in returns to commercialism.

Hospital managers whose compensation contracts include P4P have incentives to increase income by increasing revenues and operating efficiently (i.e., optimize cost). These incentives differ from the incentives to meet an earnings benchmark discussed earlier because they are ongoing and do not represent a response to a given level of earnings. P4P incentives will most notably interact with benchmark-related incentives to decrease income by increasing expenditures. For these firms, P4P incentives act in opposition to the benchmark-related earnings management incentives. Indeed, we expect the direct compensation incentives to manage income upward to be more salient to managers than incentives to manage income downward toward the benchmark. Managers will receive an immediate benefit from such earnings management, whereas the consequences of additional scrutiny are much more uncertain. We hypothesize:

H3a: Pay-for-performance incentives moderate real earnings management incentives to increase spending on operating, non-operating, and non-revenue-generating activities.

The impact of P4P for managers with benchmark-related incentives to increase income is less clear. Because managers with P4P incentives have a continual incentive to increase income and their firms may be operating at efficient levels, it is questionable whether these managers will have the ability to further reduce expenditure levels based upon short-term, benchmark-related incentives. On the other hand, the combined incentive stemming from both types of incentives may make it more likely that managers will respond to the incentive to increase income. We do not include a separate P4P hypothesis for managers with incentives to increase income, but we include an interaction term in our empirical models to explore the combined incentive.

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[5] Note that the benchmark referred to in H1a and H1b differs from the benchmark referred to in H2a and H2b. For example, hospital managers have incentives for non-negative return on assets for H1a and H1b, but have incentives to have a return on assets less than, say, 5 percent to avoid scrutiny.

Hospitals are continually replacing assets due to new diagnostic methods and improvements in technology. Unlike expenditure levels discussed in H3a, managers thus have a continuing source of assets that can be sold to facilitate earnings management. Managers with P4P contracts have a greater incentive to sell rather than retain excess assets that would result in a net gain. This incentive exists for all managers with P4P contracts, including those managers with benchmark-related incentives to increase or decrease income. P4P incentives are consistent with benchmark-related incentives to increase income, but work in opposition to benchmark-related incentives to decrease income. Our hypothesis is:

H3b: Pay-for-performance incentives moderate real earnings management incentives to decrease asset sales that would result in gains.

III. EMPIRICAL ANALYSIS

Descriptive Statistics

The initial sample consists of all California nonprofit hospitals over the years 1998–2003. Nonprofit hospitals include church-owned and community hospitals registered under IRS Section 501(c)(3). We analyze California hospitals because the Office of Statewide Health Planning and Development collects department-level financial and nonfinancial data for all California hospitals, which include a variety of hospital ownership types. The data include cost report information and subcategories of aggregations used on financial statements. California requires that all of the reported data reconcile with hospital financial statements, which must conform to U.S. Generally Accepted Accounting Principles. We exclude substance abuse and psychiatric hospitals and those that provide extensive long-term nursing care. Production functions and patient mix for these hospitals differ from those of acute care general hospitals. In addition, government reimbursement programs for specialty hospitals differ from reimbursement programs for general hospitals. Finally, we exclude 124 observations due to lack of data for specific variables. Of the remaining 179 hospitals, we exclude an additional 84 hospitals because the relation between pay and performance is negative in the compensation equation. Overall, our sample consists of 95 hospitals and 432 hospital years.

Table 1, Panel A provides descriptive statistics for the sample hospitals. The mean (median) net revenue for the sample is $116 million ($79 million). The mean (median) net income for the sample is $6.2 million ($1.6 million). Mean (median) total assets are $129 million ($79 million). The skewness of these distributions suggests that the sample includes proportionately more small, rural hospitals than large, urban hospitals, which is typical of hospital demographics in Western states. Total expenditures for non-operating (non-revenue-generating) activities are on average 20 percent (36 percent) of the absolute value of net income, so it is likely that management of these expenditures could have a material effect on net income. The largest component of non-revenue-generating activities is general services, with untabled mean (median) expenditures of $6 million ($4.2 million). General services includes activities such as printing and duplicating, grounds, communications, plant maintenance, and support departments for basic operations such as laundry, pharmacy, and dietary. Total expenditures for operating activities are $64 million, on average. Operating expenditures include daily hospital services, ambulatory services, and ancillary services, which average $19.9, $7.6, and $36.4 million, respectively. The mean (median) gain on sale of property is $94,000 ($0). The range is large, however, with a maximum of $4.3 million (2.24 percent of assets). Thus, while relatively uncommon, asset dispositions can have a material effect on net income. Table 1, Panel B, provides the Pearson correlations. Changes in non-operating, non-

TABLE 1

Descriptive Statistics

Panel A: Descriptive Statistics for 432 California Nonprofit Hospital Years (1998–2003) with Available Data

Variables (000s, except percents)	Mean	Median	Std. Dev.	1st Quartile	3rd Quartile	Min.	Max.
Net revenues	115,720	79,252	116,957	40,777	150,429	5,138	651,350
Net income	6,195	1,620	17,586	−1,044	6,779	−18,565	112,951
Total assets	128,840	78,751	141,678	36,830	167,171	2,123	791,989
Pay-for-performance sensitivity	3.76	1.69	5.36	0.76	3.97	0.07	27.17
Total Compensation	1,467	837	1,667	441	1,868	26	8,168
Non-operating activity expenditures	901	216	1,614	0	804	0	8,355
ΔNon-operating activity expenditures	80	0	1,385	−48	134	−6,513	6,441
Absolute value [ΔNon-operating activity expenditures/net income]	20.21%	2.22%	63.38%	0.09%	13.46%	0.00%	470.64%
ΔNon-operating activity expenditures/total assets	0.01%	0.00%	1.17%	−0.09%	0.17%	−8.02%	4.59%
Non-revenue-generating expenditures	7,683	5,108	8,552	2,289	9,532	278	42,593
ΔNon-revenue-generating expenditures	472	174	1,534	−95	747	−4,357	7,409
Absolute value [ΔNon-revenue-generating expenditures/net income]	36.36%	11.42%	82.60%	3.88%	31.43%	0.14%	626.64%
ΔNon-revenue-generating expenditures/total assets	0.23%	0.14%	1.65%	−0.43%	0.86%	−6.14%	5.34%
Total operating expenditures	64,216	45,743	61,168	23,261	84,122	2,939	326,905
ΔTotal operating expenditures	4,813	2,554	8,979	4,848	67,177	−17,593	77,558
Daily hospital service expenditures	19,871	14,190	18,178	6,915	25,897	385	90,981
Ambulatory service expenditures	7,643	4,492	9,627	2,422	8,820	0	61,687
Ancillary service expenditures	36,474	24,289	35,341	12,182	48,701	1,445	194,592
Gain on sale of property	94	0	482	0	10	0	4,250
Absolute value [gain on sale of property/net income]	1.89%	0.00%	8.82%	0.00%	0.35%	0.00%	66.10%
Gain on sale of property/total assets	0.06%	0.00%	0.27%	0.00%	0.01%	0.00%	2.24%

(continued on next page)

TABLE 1 (continued)

Panel B: Pearson Correlation for 432 California Nonprofit Hospital Years (1998–2003) with Available Data

	ΔNon-Operating Activity Expenditures	ΔNon-Revenue-Generating Expenditures	ΔNon-Operating Activity Plus Non-Revenue-Generating Expenditures	ΔTotal Operating Expenditures
ΔNon-revenue-generating expenditures	0.387			
p-value	(< 0.001)			
ΔNon-operating activity plus Non-revenue-generating expenditures	0.983	0.210		
p-value	(< 0.001)	(< 0.001)		
ΔTotal operating expenditures	0.898	0.243	0.903	
p-value	(< 0.001)	(< 0.001)	(< 0.001)	
Gain on sale of property	0.172	−0.017	0.186	0.189
p-value	(< 0.001)	(0.726)	(< 0.001)	(< 0.001)

Panel C: Frequency of Hospital Years by Income Level and Type of Expenditure

Hospital Type	Binary Variable	Non-Revenue-Generating Expenditures	Non-Operating Expenditures
Income above benchmark—predicted to decrease income by increasing expenditures	*Increase*	184	145
Income below benchmark—predicted to increase income by decreasing expenditures	*Decrease*	74	31
Income within benchmark—predicted to maintain expenditures	*Baseline*	112	117
Income far below benchmark—no prediction	*Nopred*	62	98
Total		432	391

All variables winsorized at the 1 percent and 99 percent levels.

revenue-generating, and operating expenditures are significantly correlated, suggesting that real earnings management is likely to occur in more than one area.

Net Income as a Benchmark

Our hypotheses concern managerial decisions about expenditure levels that impact performance relative to a benchmark, making it crucial to identify that benchmark. Because nonprofit hospitals are not publicly traded, typical benchmarks such as analyst forecasts are

unavailable. However, prior research documents a discontinuity around 0 earnings (Hayn 1995; Burgstahler and Dichev 1997; Degeorge et al. 1999; Jacob and Jorgensen 2007), which is interpreted as evidence of earnings management by firms to meet earnings benchmarks, although others claim the discontinuity is an artifact of the data (see Durtschi and Easton 2005).[6] We use zero net income as the benchmark that nonprofit hospitals want to meet. By contrast, Leone and Van Horn (2005) use zero operating income as the benchmark.[7] They focus on accruals management, which would primarily impact accounts associated with revenue-generating activities and would be reflected in operating income. We explore the effects of non-operating and non-revenue-generating activity expenditures, so our benchmark is net income. To identify firms that just meet zero earnings, we group firm-years into intervals based on net income divided by total assets at the beginning of the year. Then, following Degeorge et al. (1999), we construct categories of scaled earnings for widths of 0.04.[8] We identify firms that just meet zero earnings by concentrating on hospital-years in the interval to the immediate right of zero.

Tests of H1a, H1b, and H2a

H1a, H1b, and H2a focus on the use of activity expenditures to manage earnings, either upward (H1a and H1b) or downward (H2a) to reach a benchmark. First we calculate net income before spending for the category of interest (i.e., non-operating, operating, or non-revenue-generating activity). We then calculate the "projected income" by adding back the level of spending on the category of interest in year $t-1$. Therefore, projected income is net income if the firm had spent the same amount on the category of interest as in year $t-1$. We then examine whether projected income is above, below, far below, or within the benchmark range.[9] We classify a firm as being within the benchmark range if net income deflated by lagged assets is in the interval [0.0, 0.04), which represents bins 0 and 1. We classify firms as "far below" if their projected income is below zero by more than the expenditure level in $t-1$. These firms cannot reach the benchmark by managing expenditures in that specific category of interest.

Hospitals with projected income below the benchmark range have incentives to increase income to achieve the benchmark range. Thus, for H1a and H1b, we expect managers to decrease expenditures relative to the prior period so that actual net income is more positive than projected income.[10] Hospitals with projected income above the benchmark range, however, have incentives to reduce actual income to avoid additional scrutiny. We expect these managers to increase expenditures relative to the prior period (H2a). For hospitals with projected income within the

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[6] Durtschi and Easton (2005) provide evidence that the discontinuity around zero earnings can be caused by the deflator because it is significantly smaller for firms just below zero than at zero. For our sample of nonprofit hospitals, total assets are not significantly different between firms just below zero (81.46M) and firms at or just above zero (74.22M).

[7] They note, however, that net income would be a defensible alternative benchmark and tests using income-after-non-operating adjustments provide similar results as do their tests using operating income.

[8] Degeorge et al. (1999) determine bin widths based upon $2(\text{IQR})n^{-1/3}$, where IQR is the sample interquartile range and n is the number of available observations. In addition, as a robustness check, we also use smaller bin widths (both 0.02 and 0.03) and find qualitatively similar results (untabulated).

[9] To examine whether managers have changed expenditures from expected levels, we need an expectations model. While the level of non-operating and non-revenue-generating expenditures are discretionary, for many of these activities operations require a minimum expenditure level. Operating departments have a substantial amount of fixed costs, so they also require a minimum expenditure level.

[10] For the non-operating expenditure sample, of the firms with incentives to increase/decrease, 23 percent actually meet the benchmark (15 percent of hospitals with incentives to decrease; 23 percent of hospitals with incentives to increase). For the non-revenue-generating expenditure sample, of the firms with incentives to increase/decrease, 22 percent actually meet the benchmark (6 percent of hospitals with incentives to decrease; 28 percent of hospitals with incentives to increase).

benchmark range, we expect no change in expenditure levels relative to the prior year. We have no directional prediction for hospitals with adjusted income that is far below the benchmark. In addition to maintaining expenditure levels similar to the prior year, managers of these hospitals might either (1) decrease expenditures to move closer to the benchmark range, even though they cannot achieve the benchmark, or (2) shift future expenditures, such as replacing or disposing of old equipment used in daily operations, to the current period so that they have a better chance of achieving the benchmark in the next period (i.e., take a "bath").

Table 1, Panel C, provides information about the frequency of hospital year observations by income level and type of expenditure. For total non-revenue-generating expenditures, of the 432 available observations, 184 have income above benchmark and based upon H2a, are predicted to increase expenditures relative to the prior year. Seventy-four have income below benchmark and based upon H1a, are predicted to decrease expenditures relative to the prior year. One hundred twelve observations have income within the benchmark and are expected to maintain expenditure levels. We make no predictions for the remaining 62 observations. For non-operating expenditures, of the 391 available observations, 145 are predicted to increase expenditures, 31 are predicted to decrease expenditures, 117 are expected to maintain expenditure levels, and we make no predictions for the remaining 98 observations. Our empirical models employ indicator variables for the categories of hospital years that we expect a relative increase or decrease in expenditures (*Increase* and *Decrease*, respectively), or where we have no prediction (*Nopred*). Hospital years for which we expect no change in expenditure levels from the prior year serve as the base.

We perform multivariate regressions with changes in expenditures for total non-operating, operating, and non-revenue-generating activity (expenditures in period t minus expenditures in period $t-1$) as dependent variables. As described above, our primary independent variables of interest are indicator variables reflecting our predictions. Our analysis is based upon the following model (1):[11]

$$\Delta Expend_{it} = a_0 + \beta_1 Decrease_{it} + \beta_2 Increase_{it} + \beta_3 Nopred_{it} + \beta_4 LogAsset_{it} + \beta_5 \Delta Sales_{it} + \Sigma_{j=1}^{5} \beta_{5+j} YEAR_j + \varepsilon_{it}, \quad (1)$$

where:

$\Delta Expend$ = change in non-operating or non-revenue-generating activity expenditure from $t-1$ to t, deflated by assets;
Decrease = 1 if projected income is below benchmark range by an amount less than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Increase = 1 if projected income is above benchmark range, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Nopred = 1 if projected income is below benchmark range by an amount greater than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
LogAsset = log of total assets;
$\Delta Sales$ = change in sales from $t-1$ to t, deflated by assets; and
YEAR = 1 if observation is in year j of the sample, 0 otherwise.

We use *LogAsset* to control for size and $\Delta Sales$ to control for changes related to ordinary operations. We employ gross charges as a measure of sales to best reflect hospitals' use of resources to provide patient care. Net reimbursement would ignore changes in charity care and changes in

[11] The model is estimated via OLS, using Roger's robust standard errors and year indicators to control for hospital and year clustering (Gow et al. 2010; Petersen 2009).

resources used under capitation contracts.[12] Given the model structure, the variables *Decrease*, *Increase*, and *Nopred* reflect incremental differences from the base firm hospitals that we expect to have the same expenditure levels as the prior year.

Tests of H3a

Our model development thus far has not considered managers' pay-for-performance incentives. H3a predicts that, regardless of proximity to the earnings benchmark, managers with positive P4P incentives will decrease expenditures (with the exception of daily hospital services). To incorporate performance-based compensation incentives into our model, we first estimate a hospital-level measure of P4P. To control for size effects, we follow the general model outlined in Sloan (1993), where change in the log of pay is a function of the change in return-on-assets. Because our compensation measure reflects the top administrative team, we scale by the number of full-time equivalents (FTEs) in the department to reflect the pay level of individuals in the team.[13] Accordingly, we estimate the equation as:

$$\Delta Log[Total\ Compensation_t/FTE_t] = \eta_0 + \eta_1 \Delta ROA_t + \eta_2 HHindex_t + \eta_3 StdROA_t + \varepsilon_t. \quad (2)$$

Total Compensation is the annual sum of direct salaries, bonuses, and benefits of the top hospital administrators, which include the CEO, Medical Director, Nursing Director, and their assistants.[14] We analyze top management pay because these individuals work together to guide hospital operations.[15] *FTE* is the number of full-time equivalent employees in hospital administration. ΔROA is the sum of operating and non-operating income, deflated by assets for year t minus the sum of operating and non-operating income deflated by assets for year $t-1$. In addition, we augment the Sloan (1993) model to include two variables that influence the relationship between pay and performance.[16] *HHindex* is the Herfindahl-Hirshman Index calculated based on the number of beds in the Metropolitan Statistical Area in which the hospital resides (Lambert and Larcker 1995; Balakrishnan et al. 2010). We control for competition because hospitals in more competitive metropolitan areas have greater incentives to motivate their managers to operate efficiently to sustain economic viability.[17] *StdROA* is the standard deviation of ROA over three years and is included because pay can be influenced by earnings volatility (Sloan 1993; Shaw and Zhang 2010).[18] We estimate Equation (2) at the hospital level, over the period 1995–2003. The coefficient η_1 provides our firm-specific measure of pay-performance sensitivity, *P4P*.

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[12] As an alternative measure to control for changes in operations, we use Adjusted Patient Days. This industry standard measure is inpatient days adjusted for outpatient volume. Results are similar using this alternative control variable.

[13] To validate this compensation variable, we analyze CEO pay from IRS Form 990s for 39 hospitals with available data. We compare the Form 990 figures to our variable of total pay for the top administrative team. Over the period 2003 to 2009, the correlation is 0.7484 ($p < 0.01$). The Pearson correlation for 2003, the year that overlaps our sample period, is 0.7208 ($p < 0.01$). These correlations increase our confidence in this proxy.

[14] Our dataset does not include compensation details for each administrator. A similar dataset is used in Lambert and Larcker (1995), Eldenburg and Krishnan (2008), and Eldenburg et al. (2009).

[15] Lambert and Larcker (1995) use proprietary data and find compensation for the CEO is similar in structure to compensation for the top five hospital administrators.

[16] Our results are robust when we estimate Equation (2) without the additional control variables (i.e., change in compensation regressed on change in *ROA*).

[17] Lambert and Larcker (1995) suggest there is an optimal trade-off between incentive compensation and other disciplinary devices to induce appropriate action from the management. They discuss three motivational devices: market competition, regulation, and monitoring by the board. Because we use data from one state, regulation should not vary across our sample. As a robustness check for monitoring, we include an indicator variable for whether the hospital has governing board expense. The results are similar. We do not include this variable in the final model because governing board expense is zero for 80 percent of hospitals.

[18] We use the standard deviation of *ROA*. Our results are robust if we use the standard deviation of net income instead.

Of the total 179 hospitals with data, 84 (or 47 percent) have a negative η_1. Unlike for-profit hospitals, profit is not necessarily the primary objective for hospital managers, so hospitals must strike a balance between social objectives and profit objectives. The importance of profits is thus likely to vary widely by hospital and include a negative relation between pay and financial performance. For example, if a hospital values charity care, then each charity patient contributes positively to that objective, but negatively affects financial performance. Because nonfinancial objectives vary widely across hospitals and are difficult to measure, we use pay-for-performance incentives to help discriminate earnings management from appropriate operational decisions, limiting our sample to the 95 hospitals with a positive relation between pay and performance.

Table 1 presents descriptive statistics for *P4P*. The coefficient ranges from 0.070 to 27.17, with a mean of 3.76. Overall, untabulated analysis reveals that the coefficient on ΔROA is significantly different from zero using the Fama and MacBeth (1973) approach that calculates the standard error of the mean of coefficients across hospitals. The mean value of the coefficient across hospitals is 3.76 ($p < 0.01$). 27.4 percent of the coefficients on ΔROA are significantly different from zero and the mean R^2 across hospitals is 0.47.

We incorporate pay-for-performance into Equation (1) as follows:

$$\begin{aligned}\Delta Expend_{it} = {} & a_0 + \beta_1 Decrease_{it} + \beta_2 Increase_{it} + \beta_3 Nopred_{it} + \beta_4 P4P_i + \beta_5 Decrease_{it} * P4P_i \\ & + \beta_6 Increase_{it} * P4P_i + \beta_7 Nopred_{it} * P4P_i + \beta_8 LogAsset_{it} + \beta_9 \Delta Sales_{it} \\ & + \Sigma_{j=1}^{5} \beta_{9+j} YEAR_j + \varepsilon_{it}. \end{aligned} \tag{3}$$

We predict a positive sign for β_2 and negative signs for β_1, β_4, β_5, and β_6.

Table 2 presents results from estimating Equation (3) for non-operating and non-revenue-generating expenditures. The intercept represents the change in expenditure for hospitals within the target range (based on last year's spending) and without pay-for-performance incentives. The intercept is insignificant for all samples presented in Table 2. The first column contains estimates with aggregate change in total non-operating *and* non-revenue-generating activities as the dependent variable. The coefficient estimate on the decrease indicator variable is −0.010 and is marginally significant ($p = 0.08$). The coefficient estimate on the increase indicator variable is 0.005 and is also marginally significant ($p = 0.10$). Consistent with H1a, hospitals that could reach the benchmark range by decreasing (increasing) expenditures have changes in these expenditures that are more negative (positive) than the other sample hospitals. The coefficient on *P4P* is negative and significant ($p = 0.06$) suggesting that managers are more likely to decrease non-operating and non-revenue-generating expenditures when *P4P* incentives are high. The coefficient on *Decrease* * *P4P* is negative, although not significant ($p = 0.18$). Consistent with H3a, the coefficient on *Increase* * *P4P* is negative and marginally significant ($\beta_6 = -0.00122$, $p = 0.10$) suggesting that these incentives appear to moderate the tendency for managers to decrease income when it is high. The coefficient on *Nopred* is positive and marginally significant ($\beta_3 = 0.010$, $p = 0.10$) indicating that those nonprofit hospitals that cannot possibly reach the benchmark tend to increase expenditures, consistent with "taking a bath."

The second column documents estimates using change in total non-operating expenditures (net of losses on asset dispositions) as the dependent variable. The evidence is consistent with both H1a and H1b. Hospitals that could achieve the benchmark range by decreasing (increasing) expenditures have changes in these expenditures that are significantly more negative (positive) than the other hospitals. The coefficient estimate on the decrease indicator variable is negative (−0.027) and significant ($p = 0.08$) and the coefficient estimate on the increase indicator variable is positive (0.007) and significant ($p = 0.02$), providing support for H1a and H2a. The coefficient on *Decrease* * *P4P* is not significant, so pay-for-performance incentives alone do not appear to result in further decreases in non-operating expenditures ($\beta_5 = 0.00196$, $p = 0.17$). The coefficient on *Increase* *

TABLE 2

OLS Regression of Change in Expenditures on Earnings and Pay-for-Performance Incentives for Non-Operating and Non-Revenue-Generating Activities

Variable	Pred.	Dep. Variable: Non-Operating and Non-Revenue-Generating $\Delta NOCC_t + \Delta EXP_t$	Dep. Variable: Non-Operating Expenditures $\Delta NOCC_t$	Dep. Variable: Non-Revenue-Generating Expenditures ΔEXP_t
Intercept		0.009	−0.013	−0.002
		(0.660)	(0.438)	(0.896)
$Decrease_t$	−	−0.010	−0.027	−0.052
		(0.081)*	(0.077)*	(0.011)**
$Increase_t$	+	0.005	0.007	0.003
		(0.095)*	(0.023)**	(0.142)
$Nopred_t$		0.010	0.002	0.009
		(0.096)*	(0.507)	(0.021)**
P4P	−	−0.00037	0.00014	−0.00028
		(0.058)*	(0.196)	(0.020)**
$Decrease_t * P4P$	−	−0.00151	0.00196	−0.00235
		(0.182)	(0.170)	(0.056)*
$Increase_t * P4P$	−	−0.00122	−0.00183	−0.00132
		(0.100)*	(0.019)**	(0.057)*
$Nopred_t * P4P$		−0.00051	−0.00180	−0.00051
		(0.364)	(0.099)*	(0.263)
$LogAsset_t$		−0.005	0.008	−0.006
		(0.805)	(0.371)	(0.761)
$\Delta Sales_t$		0.000	0.001	0.001
		(0.955)	(0.389)	(0.494)
Year indicators		Yes	Yes	Yes
No. of Obs.		432	391	432
R^2		0.12	0.14	0.14

*, **, *** Represent statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively, one-tailed (two-tailed on *Nopred* and the control variables).
p-values in parentheses. The p-values are computed using Roger's robust standard errors correcting for hospital clustering. Hospitals for which the independent variable is zero in every year between 1998 and 2003 are deleted from the sample. All variables are winsorized at the 1 percent and 99 percent levels.

Variable Definitions:
$\Delta NOCC$ = change in non-operating cost center expenditures deflated by assets;
ΔEXP = change in non-revenue-producing expenditures (includes total research expenditures, total administrative services, total general services, and total education expenditures) deflated by assets;
Decrease = 1 if projected income is below benchmark range by an amount less than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Increase = 1 if projected income is above benchmark range, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Nopred = 1 if projected income is below benchmark range by an amount greater than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
P4P = pay-for-performance sensitivity calculated from Equation (2);
LogAsset = natural log of total assets; and
$\Delta Sales$ = change in sales deflated by total assets.

P4P is negative and significant ($\beta_5 = -0.00183$, p = 0.02), however. Pay-for-performance incentives thus appear to result in further decreases in expenditures for hospitals with incentives to reduce income toward the benchmark.

The third column of Table 2 presents results for Equation (3) with non-revenue-generating expenditures as the dependent variable. Our measure of non-revenue-generating expenditures excludes fiscal services because this category includes components that are unlikely to be discretionary (such as patient accounting and admitting in fiscal services). Regression results provide further evidence to support H1a; the coefficient *Decrease* is negative and significant ($\beta_1 = -0.052$, p = 0.01). The coefficient on *Increase* is insignificant (p = 0.14). The coefficient on *P4P* is negative and significant, suggesting that managers are more likely to decrease non-revenue-generating expenditures when *P4P* incentives are high. The coefficient on the interaction of *P4P* with *Decrease* is significantly negative (p = 0.06), suggesting that these incentives exacerbate the tendency for managers to decrease expenditures when income is low. The coefficient on the interaction of *P4P* with *Increase* is also significantly negative (p = 0.06), suggesting that these incentives appear to mitigate the tendency for managers to increase expenditures when income is high, consistent with H3a. In addition, the coefficient on *Nopred* is positive and significant ($\beta_3 = 0.009$, p = 0.02). These findings provide further evidence that firms with projected incomes far below benchmark range shift future "other operating" expenditures to the current period so that they have a better chance of achieving the benchmark in the next period (i.e., take a "bath").[19]

Table 3 presents results of estimating Equation (3) for operating expenditures. The first column contains results for total operating expenditures, and the following three columns present results for expenditures on daily hospital services, ambulatory services, and ancillary services. H1b predicts that real earnings management for hospitals that have incentives to manage earnings upward will be less prevalent for daily hospital services (the core of the hospital's business). H2a does not differentiate among the types of operating expenditures because expenditure increases are unlikely to threaten the hospital's core operations. Results reported in the first column of Table 3 provide evidence that operating expenditures are not used to manage toward the benchmark. The coefficient on *Decrease* is 0.009 (p = 0.37) and the coefficient on *Increase* is 0.006 (p = 0.41). The coefficient on *Nopred* is positive and significant (p < 0.01).[20]

When we separate operating expenditures into daily hospital services, ambulatory services, and ancillary services, it appears that neither management of expenditures toward the benchmark nor response to pay-for-performance incentives occurs for daily hospital services. In the second column of Table 3, none of the coefficients are significantly different from zero in the predicted direction. In contrast, for ambulatory services (the third column of Table 3), we find a significantly negative coefficient on *Decrease* (p < 0.01). The incremental effect (relative to the base hospitals for which we expect no change in expenditure levels from the prior year) is negative, although the absolute effect is positive because the magnitude of the coefficient is less than the magnitude of the intercept.

The coefficient on *P4P* is significant and negative for ambulatory and ancillary services but not for daily hospital services. The coefficients on the interaction of *P4P* with *Decrease* and *Increase*

[19] We also examine univariate changes in expenditures by incentive category (Increase, Decrease, No Prediction, and Maintain). The results (untabulated) are consistent with hospitals managing expenditures in the predicted direction and by amounts that are large enough to have a material effect on net income. For example, mean change non-operating activities as a percentage of the absolute value of net income is 5.1 percent, −44.0 percent, −0.46 percent, and 19.4 percent for the Increase, Decrease, No Prediction, and Maintain category, respectively. Unconditional mean changes for the non-operating activities, non-revenue-generating, and non-operating plus non-revenue-generating expenditures samples are negative for the Decrease hospitals and positive for the Increase hospitals.

[20] The coefficient of the interaction *Nopred* * *P4P* is missing for operating expenditures and ancillary services because there is only one hospital in that category.

TABLE 3

OLS Regression of Change in Operating Expenditures on Earnings and Pay-for-Performance Incentives

Variable	Pred.	Dep. Variable: Operating Expenditures ΔOP_t	Dep. Variable: Daily Hospital Services Expenditures ΔDHS_t	Dep. Variable: Ambulatory Services Expenditures ΔAMB_t	Dep. Variable: Ancillary Services Expenditures ΔANC_t
Intercept		0.233	0.049	0.081	0.099
		(0.025)**	(0.195)	(0.003)***	(0.136)
$Decrease_t$	−	0.009	0.013	−0.015	0.007
		(0.368)	(0.015)	(0.004)***	(0.288)
$Increase_t$	+	0.006	0.000	0.002	−0.005
		(0.409)	(0.454)	(0.228)	(0.231)
$Nopred_t$		0.258	0.041	0.008	0.024
		(0.001)***	(0.223)	(0.126)	(0.817)
P4P	−	0.00048	−0.00038	−0.00022	−0.00089
		(0.432)	(0.201)	(0.041)**	(0.031)**
$Decrease_t * P4P$	−	−0.002	−0.001	0.002	0.001
		(0.329)	(0.175)	(0.031)	(0.304)
$Increase_t * P4P$	−	−0.001	0.000	0.001	0.001
		(0.404)	(0.197)	(0.030)	(0.018)
$Nopred_t * P4P$			−0.067	−0.001	
			(0.265)	(0.072)*	
$LogAsset_t$		−0.013	0.018	0.000	−0.006
		(0.887)	(0.545)	(0.984)	(0.912)
$\Delta Sales_t$		−0.009	−0.001	−0.004	−0.003
		(0.101)	(0.486)	(0.007)***	(0.362)
Year indicators		Yes	Yes	Yes	Yes
No. of Obs.		432	432	432	432
R^2		0.07	0.09	0.10	0.06

*, **, *** Represent statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively, one-tailed (two-tailed on *Nopred* and the control variables).
p-values in parentheses. The p-values are computed using Roger's robust standard errors correcting for hospital clustering. Hospitals for which the independent variable is zero in every year between 1998 and 2003 are deleted from the sample. All variables are winsorized at the 1 percent and 99 percent levels.

Variable Definitions:
ΔOP = change in total operating expenditures (daily hospital, ambulatory, ancillary, and purchases) deflated by assets;
ΔDHS = change in daily hospital service expenditures deflated by assets;
ΔAMB = change in ambulatory service expenditures deflated by assets;
ΔANC = change in ancillary service expenditures deflated by assets;
Decrease = 1 if projected income is below benchmark range by an amount less than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Increase = 1 if projected income is above benchmark range, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Nopred = 1 if projected income is below benchmark range by an amount greater than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
P4P = pay-for-performance sensitivity calculated from Equation (2);
LogAsset = natural log of total assets; and
$\Delta Sales$ = change in sales deflated by total assets.

are not significant in the predicted direction. Overall, these results indicate no significant management of expenditures toward the benchmark within hospital operating categories, except for modest evidence in one area that is not central to hospital operations (i.e., ambulatory services). However, there is evidence of management of expenditures in ambulatory and ancillary services in response to *P4P* incentives.

Tests of H1c, H2b, and H3b

H1c, H2b, and H3b concern the use of fixed asset dispositions to manage earnings toward the net income benchmark. For all of the observations in our sample, asset dispositions resulted in net gains, so we examine the effects of gains on earnings. We expect hospitals with net income before asset dispositions ("pre-managed" income) that are below the net income benchmark range to increase net income by disposing of assets (H1c). Hospitals that are above the benchmark range might be less likely to report a gain on asset sales to minimize increases in net income from asset dispositions (H2b). Finally, hospitals' P4P incentives could moderate real earnings management incentives to decrease asset sales that would result in gains when hospitals are above the benchmark range (H3b).

Tests for these hypotheses differ somewhat from the approach used for the earlier hypotheses because, as Table 1 indicates, gains on the sale of property are relatively rare, so using prior year gains as a benchmark is impractical.[21] We also need to consider asset gains that would occur during the normal course of operations. Accordingly, we analyze gains on sale of property for hospitals with pre-managed income just above and below the benchmark range, relative to hospitals in bins 0 and 1. We expect that hospitals with pre-managed earnings just below the benchmark are more likely than are other hospitals to report gains on asset sales (H1c), hospitals with pre-managed income just above the benchmark are less likely to report gains on asset sales (H2b), and hospitals' P4P incentives moderate incentives to decrease asset sales when they are above the benchmark (H3b). To test these hypotheses, we use a logistic regression to model the relation between the likelihood of reporting a gain on property sales in the current year and a hospital's ability to meet or beat the current year's net income benchmark, based on pre-managed income. Our model follows:

$$\begin{aligned} Gain_{it} = {} & a_0 + \beta_1 BelowZero_{it} + \beta_2 AboveZero_{it} + \beta_3 P4P_i + \beta_4 BelowZero_{it} * P4P_i \\ & + \beta_5 AboveZero_{it} * P4P_i + \beta_6 \Delta Sales_{it} + \beta_7 ROA_{it} + \beta_8 PPE_{it-1} + \beta_9 LogAsset_{it} \\ & + \Sigma_{j=1}^{5} \beta_{9+j} YEAR_j + \varepsilon_{it}, \end{aligned} \tag{4}$$

where:

Gain = 1 if the hospital reports a net gain on the sale of property in year *t*, 0 otherwise;
BelowZero = 1 if pre-managed income/total assets is in a bin just to the left of the benchmark range, [−0.04, 0), 0 otherwise;
AboveZero = 1 if pre-managed income/total assets is in a bin just to the right of the benchmark range, [0.04, 0.08), 0 otherwise;
ROA = net income deflated by assets; and
PPE = property, plant, and equipment deflated by assets (excluding PPE); and other variables as defined above.
Other variables are defined previously.

We control for size (*logAsset*) and two measures of performance (Δ*Sales, ROA*). Lagged property, plant, and equipment (PPE_{t-1}) accounts for the availability of assets for disposal, and year

[21] Note that we have no observations where the hospitals report a net loss on the sale of assets.

indicators control for year-specific effects. We define *BelowZero* as the bin width just to the left of 0 (i.e., in the interval [−0.04, 0.00)) and *AboveZero* as the bin width just to the right of 0 (i.e., in the interval [0.04, 0.08)). The analysis is limited to hospitals in the bin widths just around the benchmark to rule out alternative explanations for asset dispositions that would occur during the normal course of operations. The average reported gain as a percentage of the absolute value of net income is 1.74 percent (reported in Table 1), so reported gains should materially affect hospitals' ability to move closer to the benchmark. Since the conventional logit coefficients on interaction terms do not provide a valid statistical test, we compute the correct coefficient, marginal effect, and Z-statistic for our interaction terms, as suggested by Norton et al. (2004).

Table 4 presents these results. The coefficient on *BelowZero* is insignificant, failing to provide support for H1c. The coefficient on *AboveZero*, however, is negative and significant (−2.35; p = 0.02), providing support for H2b. The two coefficients differ significantly (p = 0.06). Accordingly, we find evidence that hospitals just above the benchmark range are less likely to report a gain than other hospitals. These firms could be forgoing higher levels of income to avoid scrutiny or saving asset sales for future boosts to income. Results for the pay-for-performance interaction terms indicate that hospitals with financial performance incentives and income above zero are more likely to report a gain, consistent with H3c. Results for control variables indicate that larger hospitals are more likely to report a gain. The coefficient on *ROA is* negative and significant (p = 0.08) indicating that hospitals are less likely to report a gain as performance increases. The coefficient on PPE_{t-1} is positive, but is not statistically significant.

Sensitivity Analysis

To examine the robustness of our results to our choice of the prior year's expenditures as the expected level of spending, we employ three alternative measures as the basis from which managers increase/decrease expenditures: (1) average of expenditures in years $t-1$ and $t-2$ and (2) expenditure for $t-1$ adjusted by changes in patient volume. The results (untabulated) using both alternative measures result in the same statistical conclusions as those reported in Tables 2 and 3.

A limitation of the earnings management literature is that the results could reflect an omitted variable or could be capturing behavior other than intentional manipulation such as good management. While we cannot definitively infer that we are observing opportunistic behavior, we can provide additional supportive evidence that managers are manipulating earnings rather than managing ongoing operations.

First, we focus only on hospitals with incentives to meet an earnings. If we observe a manager increasing (decreasing) a particular expenditure in the current period to reach an earnings benchmark, then we would expect that expenditure to decrease (increase) when the incentive to manage earnings is no longer present. If the observed behavior is unrelated to earnings management, i.e., a good manager taking advantage of cost savings, then we would expect no reversal in expenditures in the next period, on average.

Therefore, we examine expenditure changes in year $t+1$ for firms with incentives to manage earnings in t, but no incentives to manage earnings in $t+1$. We estimate Model (3) using non-operating and non-revenue-generating expenditures in $t+1$ as the dependent variable (i.e., the year after the firm is suspected of engaging in earnings management):

$$\begin{aligned}\Delta Expend_{it+1} = {} & a_0 + \beta_1 Decrease_{it} + \beta_2 Increase_{it} + \beta_3 Nopred_{it} + \beta_4 P4P_i + \beta_5 Decrease_{it} \\ & * P4P_i + \beta_6 Increase_{it} * P4P_i + \beta_7 Nopred_{it} * P4P_i + \beta_8 LogAsset_{it+1} \\ & + \beta_9 \Delta Sales_{it+1} + \Sigma_{j=1}^{5} \beta_{9+j} YEAR_j + \varepsilon_{it}, \end{aligned} \quad (3a)$$

where all variables are as previously defined.

TABLE 4

Logit Regression of Gain on Asset Sales on Earnings and Pay-for-Performance Incentives

Variable	Pred.	Coefficient	Z-Statistic	Marginal Effects
Intercept		−6.083	−2.69***	
BelowZero	+	−0.376	−0.90	−0.08
AboveZero	−	−1.639	−2.35**	−0.26
P4P	+	0.001	0.07	0.0003
*BelowZero * P4P*	+	−0.001	−0.01	−0.0001
*AboveZero * P4P*	+	0.219	1.95*	0.048
$\Delta Sales_t$		−0.472	−0.54	−0.103
ROA_t		−1.855	−1.76*	−0.403
PPE_{t-1}		0.003	1.28	0.001
$LogAsset_t$		0.304	2.48**	0.066
p-value for the test: *BelowZero = AboveZero*		0.055		
Year indicators		Yes		
# with Sale		129		
# without Sale		260		
Model Chi-squared		27.92		
% concordant pairs (+ tied)		65.4		

*, **, *** Represent statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively, two-tailed. All variables are winsorized at the 1 percent and 99 percent levels. The Ai and Norton marginal effects and Z-statistics on the interaction term are calculated following Norton et al. (2004).

Variable Definitions:
Gain = 1 if the hospital reports a net gain on the sale of property in year *t*, 0 otherwise;
BelowZero = 1 if pre-managed income/total assets is in a bin just to the left of the benchmark range, [−0.04, 0), 0 otherwise;
AboveZero = 1 if pre-managed income/total assets is in a bin just to the right of the benchmark range, [0.04, 0.08), 0 otherwise;
$\Delta Sales$ = change in operating revenue deflated by total assets;
ROA = net income divided by total assets;
PPE = lagged property, plant, and equipment deflated by lagged assets (excluding lagged property, plant, and equipment); and
LogAsset = natural log of total assets.

Results in Table 5 for aggregate non-operating and non-revenue-generating expenditures (column 1) provide evidence that if a hospital had an earnings management incentive to decrease non-operating expenses in year *t* and no earnings management incentive in *t*+1, then the decrease reverses in year *t*+1 (coefficient on *Decrease* = 0.006, p = 0.09). For non-operating expenditures, hospitals with incentives to increase expenditures in year *t* and no incentive in *t*+1 experience reverses of the increase in year *t*+1 (coefficient on *Increase* = −0.005, p = 0.05). For non-revenue-generating expenditures, the decrease reverses in year *t*+1 (the coefficient on *Decrease* = 0.004, p = 0.10). Recall that results in Table 2 provided evidence that managers are more likely to decrease non-revenue-generating expenditures when P4P incentives are stronger (a negative and significant coefficient). Table 5 reveals that this incremental decrease reverses and the coefficient on *P4P* is positive and significant. In addition, Table 2 also indicated that managers with stronger pay-for-performance compensation tend to decrease non-revenue-generating expenditures significantly

TABLE 5

OLS Regression of One-Period-Ahead Change in Expenditures on Earnings and Pay-for-Performance Incentives for Non-Operating and Non-Revenue-Generating Activities for Nonprofit Hospitals with No Earnings Management Incentives in $t+1$

Variable	Pred.	Dep. Variable: $\Delta NOCC_t + \Delta EXP_t$	Dep. Variable: $\Delta NOCC_t$	Dep. Variable: ΔEXP_t
Intercept		0.044	−0.003	0.038
		(0.205)	(0.714)	(0.192)
$Decrease_t$	+	0.006	−0.001	0.004
		(0.090)**	(0.330)	(0.095)**
$Increase_t$	−	−0.001	−0.005	0.006
		(0.446)	(0.045)**	(0.104)
$Nopred_t$		0.012	−0.001	0.009
		(0.079)*	(0.784)	(0.067)*
P4P	+	0.187	−0.012	0.118
		(0.074)*	(0.256)	(0.064)*
$Decrease_t * P4P$	+	0.084	0.055	0.114
		(0.263)	(0.046)**	(0.093)*
$Increase_t * P4P$	+	−0.426	0.027	−0.374
		(0.022)	(0.262)	(0.002)
$Nopred_t * P4P$		−0.248	0.008	−0.296
		(0.336)	(0.785)	(0.185)
$LogAsset_t$		−0.021	−0.007	−0.001
		(0.128)	(0.218)	(0.937)
$\Delta Sales_t$		−0.002	0.000	−0.002
		(0.211)	(0.418)	(0.164)
Year indicators		Yes	Yes	Yes
No. of Obs.		155	214	157
R^2		0.16	0.07	0.17

*, **, *** Represent statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively, one-tailed (two-tailed on *Nopred* and the control variables).

p-values in parentheses. The p-values are computed using Roger's robust standard errors correcting for hospital clustering. Hospitals for which the independent variable is zero in every year between 1998 and 2003 are deleted from the sample. All variables are winsorized at the 1 percent and 99 percent levels.

Variable Definitions:

$\Delta NOCC$ = change in non-operating cost center expenditures deflated by assets;

ΔEXP = change in non-revenue-producing expenditures (includes total research expenditures, total administrative services, total general services, and total education expenditures) deflated by assets;

Decrease = 1 if projected income is below benchmark range by an amount less than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;

Increase = 1 if projected income is above benchmark range, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;

Nopred = 1 if projected income is below benchmark range by an amount greater than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;

P4P = pay-for-performance sensitivity calculated from Equation (2);

LogAsset = natural log of total assets; and

$\Delta Sales$ = change in sales deflated by total assets.

more than others. However, the reversal regression shows that the incremental decrease reverses in $t+1$ (coefficient on *Decrease* * *P4P* = 0.114, p = 0.09). Overall, Table 5 provides evidence that the observed behavior with respect to expenditures is due to earnings management rather than alternative explanations such as operations management.[22]

To further differentiate between opportunistic behavior and good operations management, we examine the relation between management in period t and future income (deflated by assets) in period $t+1$, $t+2$, and $t+3$. We focus on hospitals that were within the benchmark because the incentives are most clearly delimited for these groups. If managers with stronger pay-for-performance compensation tend to increase (decrease) a particular expenditure for opportunistic reasons, we would expect future performance to be affected negatively. However, if the observed behavior is unrelated to opportunistic earnings management, then we would not expect such an association. The first three columns of Table 6 present the results based on incentives to increase/decrease the sum of non-operating and non-revenue-generating expenditures. The last three columns of Table 6 present results based on incentives to increase/decrease operating expenditures. These tests serve as a benchmark, insofar as we expect (and find) less management of expenditures for operating expenditures. The results in Table 6 provide weak evidence consistent with opportunism rather than good management. For non-operating and non-revenue-generating expenditures, the coefficients on the two interaction terms (*Decrease* * *P4P*, *Increase* * *P4P*) are significantly negative when ROA_{t+3} is the dependent variable. We do not, however, find similar results for operating expenditures.[23]

We also perform a sensitivity test for our analysis of asset dispositions. Table 4 provides evidence that hospitals above the benchmark range are less likely to dispose of assets than are other hospitals. To control for performance effects, we limit the sample to three bin widths: just to the left of 0, just to the right of 0, and 0. These hospitals should have similar reasons to dispose of assets except for their positions relative to the benchmark range. The coefficient (untabulated) on *BelowZero* is insignificant, and the coefficient on *AboveZero* is negative and significant ($p < 0.01$), consistent with H2b.

As an additional sensitivity test, we split the *Increase* variable into two categories: (1) *JustAboveZero*, which equals 1 if net income before spending on a particular expenditure is greater than or equal to 0.04, but net income after spending on a particular expenditure (based on last year) is greater than or equal to 0.04 but less than 0.08, and (2) *FarAboveZero*, which equals 1 if net income before spending on a particular expenditure is greater than or equal to 0.04, but net income after spending on a particular expenditure (based on last year) is greater than or equal to 0.08. We find that hospitals in these two categories are not significantly different. For example, in Table 2, for the non-operating plus non-revenue-generating sample (column 1), the t-test for a difference between *JustAboveZero* and *FarAboveZero* is insignificant (p-value = 0.83) and the t-tests results find no significant (p-value = 0.93) difference between *JustAboveZero* * *P4P* and *FarAboveZero* * *P4P*. The differences are also insignificant for the non-operating (column 2) and non-revenue-generating (column 3) samples. We also separate *Increase* into two categories based on several other cutoffs for net income, specifically after spending on a particular expenditure is greater than or equal to bins 0.10, 0.12, and 0.14. The differences are not significant for any of the categories.

[22] In the analysis of operating expenditures for ambulatory services (the third column of Table 3), we find a significantly negative coefficient on *Decrease* ($p < 0.01$). However, we find no evidence of expenditure reversal in $t+1$, which is inconsistent with earnings management (untabulated).

[23] We perform the analysis in Table 6 using a measure of operating efficiency (i.e., occupancy rates) as the dependent variable. For non-operating and non-revenue-generating expenditures, the coefficient on the interaction term (*Decrease* * *P4P*) is significantly negative in $t+1$ and $t+2$. We do not find similar results for operating expenditures. The results provide some evidence that real activities manipulation leads to lower operating efficiency.

TABLE 6

Future Performance Regressions
OLS Regression of Future Performance on Earnings and Pay-for-Performance Incentives

		Incentives Based on Non-Operating Plus Non-Revenue-Generating Expenditures			Incentives Based on Operating Expenditures		
Variable	**Pred.**	ROA_{t+1}	ROA_{t+2}	ROA_{t+3}	ROA_{t+1}	ROA_{t+2}	ROA_{t+3}
Intercept		0.017	0.027	0.024	0.016	0.030	0.032
		(0.211)	(0.070)*	(0.249)	(0.303)	(0.185)	(0.258)
$Decrease_t$	−	−0.029	−0.024	0.002	−0.017	−0.010	−0.016
		(0.249)	(0.254)	(0.948)	(0.608)	(0.645)	(0.611)
$Increase_t$	+	0.052	0.042	0.048	0.006	0.005	0.003
		(0.001)***	(0.058)*	(0.072)*	(0.719)	(0.798)	(0.906)
$Nopred_t$		−0.049	−0.006	−0.028	−0.239	0.144	0.148
		(0.296)	(0.881)	(0.584)	(< 0.001)***	(0.003)***	(0.026)***
P4P	−	0.001	0.002	0.002	0.000	0.001	0.001
		(0.295)	(0.359)	(0.631)	(0.861)	(0.713)	(0.841)
$Decrease_t$ * *P4P*	−	0.002	0.001	−0.009	0.003	0.000	−0.005
		(0.265)	(0.367)	(0.050)**	(0.196)	(0.433)	(0.153)
$Increase_t$ * *P4P*	−	0.000	0.000	−0.006	0.002	0.001	−0.004
		(0.459)	(0.457)	(0.074)*	(0.152)	(0.387)	(0.226)
$Nopred_t$ * *P4P*		0.003	−0.003	−0.001	0.853	−0.068	0.140
		(0.542)	(0.516)	(0.844)	(0.001)***	(0.669)	(0.407)
ROA_t		0.433	0.343	0.356	0.679	0.505	0.576
		(0.001)***	(0.017)**	(0.031)**	(< 0.001)***	(< 0.001)***	(< 0.001)***
Year indicators		Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.		334	334	334	334	334	334
R^2		0.45	0.28	0.22	0.46	0.27	0.24

*, **, *** Represent statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively, two-tailed (one-tailed on the interaction terms *Decrease* * *P4P* and *Increase* * *P4P*).
p-values in parentheses. The p-values are computed using Roger's robust standard errors correcting for hospital clustering. Hospitals for which the independent variable is zero in every year between 1998 and 2003 are deleted from the sample. All variables are winsorized at the 1 percent and 99 percent levels.

Variable Definitions:
Decrease = 1 if projected income is below benchmark range by an amount less than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Increase = 1 if projected income is above benchmark range, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
Nopred = 1 if projected income is below benchmark range by an amount greater than prior year expenditure in the category, with benchmark range equal to income/total assets ([0, 0.04)), 0 otherwise;
P4P = pay-for-performance sensitivity calculated from Equation (2); and
ROA = net income divided by total assets.

IV. DISCUSSION AND CONCLUSIONS

Managers of both for-profit and nonprofit organizations have incentives to avoid negative net income because of contractual and reputation pressures. However, in nonprofit hospital settings, managers also have greater incentives to avoid high levels of net income to decrease the probability

of scrutiny by government and other stakeholders. We first investigate whether nonprofit hospital managers change real activities to manage net income toward a benchmark of zero. Focusing on hospitals with "projected" incomes within a narrow band around zero net income, we find evidence consistent with management of expenditures associated with non-operating and non-revenue-generating activities to achieve positive income and with management of asset dispositions to avoid large positive net incomes. Second, we include the effects of pay-for-performance incentives in our analyses. We find that hospitals with stronger incentives to manage earnings upward experience significantly larger reductions in expenditures in non-revenue-generating and non-operating activities. Third, we provide analysis to discriminate between earnings management and good operational decisions by examining reversals in the suspect expenditures in the following period and future performance. Our evidence is weakly consistent with the use of real operating decisions to manage earnings.

This study is subject to several limitations. Our analysis requires assumptions about benchmark thresholds for levels of net income that would lie within benchmark range. However, without access to explicit contracts, our bin widths are subject to measurement error. This type of error is likely to work against our results. Another limitation is that we cannot completely distinguish between good management practices and decisions made specifically to manage earnings. However we provide analysis to help distinguish between these alternatives. Although we examine California hospitals, the results should generalize to nonprofit hospitals across the United States. While state regulations vary from state to state, rate-setting regulation that limits profits is no longer used in most states (although a few states continue to monitor and regulate hospital expansion and closure plans; Tieman and Fong 2003).

Understanding the incentives faced by nonprofit organizations is important for several reasons. First, if pressure to maintain tax-exempt status or to avoid low net income creates incentives for managers to engage in value-decreasing activities (e.g., overspending on governing board meetings) or activities that do not maximize community benefit (e.g., under-spending on public relations and education), then stakeholders (taxpayers and members of the organization's community) will suffer. Second, to the extent that tax exemption is a tool that can be used to accomplish governmental purposes, regulators should be interested in the indirect costs associated with pressure on nonprofit organizations to minimize profits. Third, stakeholders of nonprofits need information about financial condition and performance to make informed regulatory, contracting, donation, and investing decisions. Inefficient resource allocation can result from decisions based on financial information that has been altered by real activity manipulations.

We contribute to the accounting literature on real activities manipulation by considering the effects on real activities stemming from compensation incentives. Earlier studies focused primarily on use of accruals or opportunistic reductions in research and development expense to manage earnings. Because of the rich dataset from public disclosure requirements for California hospitals, we are not limited to a particular expenditure category and are able to analyze several different activities. Because hospitals can choose to engage in accruals management that could either complement or substitute for real activity management, future research could examine the relation between accruals and real activity management.

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