EARNINGS MANAGEMENT IN U.S. HOSPITALS

GANG NATHAN DONG*
Columbia University

ABSTRACT

Objective: This paper examines the hospital management practices of manipulating financial earnings within the bounds of generally accepted accounting principles (GAAP).
Study Design: We conduct regression analyses that relate earnings management to hospital characteristics to assess the economic determinants of hospital earnings management behavior.
Method and Data: From the CMS Cost Reports we collected hospital financial data of all U.S. hospitals that request reimbursement from the federal government for treating Medicare patients, and regress discretionary accruals on hospital size, profitability, asset liquidity, operating efficiency, labor cost, and ownership.
Results: Hospitals with higher profit margin, current ratio, working capital, days of patient receivables outstanding and total wage are associated with more earnings management, whereas those with larger size and higher debt level, asset turnover, days cash on hand, fixed asset age are associated with lower level of earnings manipulation. Additionally, managers of non-profit hospitals are more likely to undertake some form of window-dressing by manipulating accounting accruals without changing business models or pricing strategies than their public hospital counterparts.
Conclusions: We provide direct evidence of the use of discretionary accruals to manage financial earnings among U.S. hospitals and the finding has profound policy implications in terms of assessing the pervasiveness of accounting manipulation and the overall integrity of financial reporting in this very special public and quasi-public service sector.

JEL Code: M4, G34, H25, H26
Keywords: Earnings management, hospitals

* Dept. of Health Policy & Management, Mailman School of Public Health, Columbia University. 722 W 168th Street, New York, NY 10032. Tel: 212-342-0490. E-mail: gd2243@columbia.edu. No potential conflict of interest relevant to this article was reported.

> *"HealthSouth's fraud represents an appalling betrayal of investors... HealthSouth's standard operating procedure was to manipulate the company's earnings to create the false impression that the company was meeting Wall Street's expectations."*
>
> *– Stephen M. Cutler*
> *S.E.C. Director of Enforcement*
> *The New York Times, March 20, 2003* [1]

Policymakers have been concerned with growing health care costs since the 1970s and seeking to contain costs by adopting new regulations and advocating for market-based health care systems to contain the rising cost of health care (Davis & Rowland, 1990; Antel et al., 1995). Faced with decreasing government payments and subsidies and intense market competition, hospitals had to resort to other cost cutting measures to increase earnings to avoid financial insolvency (Zwanziger & Melnick, 1988). Hospital managers who want to avoid losses can cut costs when revenues decrease and limit the cost increases when revenues increase because they are evaluated in part on their ability to a non-financial objective (e.g., quality of care) subject to a zero-profit constraint (Leone & Van Horn, 2005). Hospital managers often use a new accounting technique, earnings management which enables managers to improve their ability to cope with uncertainties in revenue and competition, to control the rising cost of health care provision or the windfall of profits.

Earnings management occurs when managers use judgment in financial accounting and in structuring transactions to alter financial reports to meet external benchmarks or to assure that they will have working capital on their accounting statements temporarily (Healy &

[1] Excerpt from Freudenheim (2003). On March 19th, 2003, the U.S. Securities

Wahlen, 1999), especially when facing short-term uncertainties in revenue and competition. This phenomenon of earnings management is pervasive not only in investor-owned for-profit corporations but also in non-profit organizations (Petrovits 2006). It is regarded as inappropriate when a misallocation of economic resources arises from managerial opportunism or when non-compliance with accounting regulations is camouflaged (Ballantine et al., 2007).

A range of incentives for managers of for-profit business to exercise discretion in financial reporting has been identified and includes capital market incentives that affect equity value (Erickson & Wang, 1999; Teoh, Welch and Wong, 1998; Teoh, Wong and Rao, 1998), managerial incentives to meet earnings targets (Burgstahler & Eames, 2003; Kasznik & McNichols, 2002), and contract-based incentives relating to executive compensation and other influences (Ahmed et al., 1999; Collins et al., 1995). The challenge in studying firms' strategic decisions in financial reporting is to disentangle the market, industry, and firm-specific characteristics leading to the observed accrual manipulation behavior. To do so, it is helpful to focus on a single sector rather than comparing firms in different industries. In other words, we can better control for the impact of sector or industry factors on strategic accounting choice. In addition, having a narrowed focus on a single sector can ensure a high level of internal validity. In this paper, we study the U.S. hospital industry to answer the question, "Is earnings management commonplace or relatively infrequent among hospitals?"

Hospitals are different from other for-profit business because they provide some services for which they do not expect to receive full payment, often referred to as charity care. Most hospitals are not subject to profit-maximization pressures by shareholders, but still they require substantial earnings to maintain financial viability,

and they are limited in how far they can pass on rising costs in higher prices to customers whose income are constrained by their own earning power (Himmelweit, 2007). Therefore, hospital administrators perceive the ability to diversify revenue sources (Clement, 1987) and to cut labor costs by resisting wage rises and reducing staffing levels (Mullaney, 1989) as vital to the financial viability of their hospitals. Unfortunately, there are not many studies in the accounting and finance literature that have examined the pervasiveness of the use of earnings management in this very special sector that plays an important role in providing public goods (e.g., charity care). In an early study to understand whether hospitals attempt to achieve a target level of earnings that satisfies the budget constraint, Hoerger (1991) finds that nonprofit hospitals minimize the variance in reported earnings. More interestingly, nonprofit hospitals have no incentive to avoid reporting earnings decreases as long as current period earnings are above zero. The author attributes this phenomenon to the lack of monitoring by the equity market because for-profit firms always manage their earnings to avoid market punishment; however, this market does not exist in the nonprofit and public healthcare sectors. Leone & Van Horn (2005) investigate both discretionary spending and accruals of U.S. not-for-profit hospitals and report significant use of discretionary accruals to meet earnings objectives.

From the CMS Cost Reports, we obtain financial statements of all U.S. hospitals that request reimbursement from the federal government for treating Medicare patients. Several unique features of this data set facilitate the current study. First, the sample includes hospitals of public, not-for-profit and for-profit ownership.[2] Second, the financial

[2] For the purposes of this study a "public" hospital is defined as a hospital operated and supported by a city, county, special district, state, or federal government. The use of "public" is different from the definition of publicly traded firms listed on the stock market.

information in the Cost Reports is more comprehensive and accurate than that of survey data. Third, the sample period from 1997 to 2010 covers two economic recessions (March 2001–November 2001 and December 2007–June 2009),[3] which enables us to study the earning management phenomenon not only across hospitals but also over time.

Using this unique data set we attempt to examine the determinants of hospitals' strategic financial reporting of earnings, including hospital size, the use of debt, profitability, asset liquidity, operating efficiency, labor cost and ownership type. Table 1 lists the hypothesized effects of these determinants on earnings management and the variables that we use to proxy for these factors.

[3] Business cycle expansion and contractions is retrieved from NBER: http://www.nber.org/cycles/cyclesmain.html

Table 1. Determinants of hospital earnings management

Control	Sign	Hypothesis	Proxy Variables
Hospital Size	Negative	Large hospitals are more likely be targeted for tax-status scrutiny due to high patient revenues and government subsidies; therefore, managers are likely to use discretionary accruals to lower income (Morrisey, Wedig and Hassan 1996).	Natural log of Total Assets
Use of Debt	Positive	A hospital with high risk of bankruptcy (financial distress) is likely to "tune up" its profit for future borrowing and investment (Wedig et al 1988).	Financial Leverage
	Negative	Limited borrowing (debt) capacity reduces the need for high profit (Widig et al 1996).	
Profitability	Positive	This is a statistical control because higher level of discretionary accruals is likely to be associated with high profit.	Total Margin
Asset liquidity	Positive	Hospitals with more liquid assets are more likely to obtain external financing for capital investment due to higher probability of repayment (Shleifer and Vishny 1992), therefore managers are likely to report larger positive earnings.	Current Ratio Working Capital To Total Assets Days Cash On Hand
Labor cost	Positive	Excessive labor costs in the form of compensation and benefits reduce profits (Sloan 2000, Sloan and Steinwald 1980). There is the need to revise up earnings to maintain financial viability.	Salary to Revenue
Operating inefficiency	Positive	Managers may engage in upward earnings manipulation to avoid losses when slack resources, wasteful capacity, dysfunctional operation and organizational chaos lower hospital income.	Days of Patient Receivables Outstanding Fixed Asset Age

Overall, we find that hospitals often use a negative discretionary accruals strategy, especially during the recent financial crisis in 2008 and 2009, to book a negative accrual in order to bring down the net income when actual earnings are above target in the hope of being able to reverse the accrual in a subsequent year when actual earnings are below target. In addition, we identified several important factors that affect hospital earning management activities: size, profitability, asset liquidity, operating efficiency, labor cost, and ownership. The findings reported in this paper can inform regulators that earnings management is pervasive not only in publicly-traded and for-profit firms but also in not-for-profit and public hospitals. They can help policymakers to improve the understanding and increase the effectiveness of public policies that finance health care provision while relying on hospital themselves to monitor their financial reporting process.

DATA AND METHOD

Annual financial statements of U.S. hospitals are obtained from the CMS Medicare Cost Reports between 1997 and 2010. According to Magnus & Smith (2000), the CMS Medicare Cost Reports is the most comprehensive database of hospital financial accounting data because every year virtually all hospitals in the U.S. are required to file a cost report in order to receive reimbursement from the federal government for treating Medicare patients. This financial accounting dataset represents the entire hospital industry and provides highly detailed financial accounting data by hospital department and function. After excluding hospitals with incomplete financial accounting information, we end up with a sample of 42,573 hospital-years. Table 2 lists the number of hospitals in each state and year. Across all years, California, Florida, New York, Ohio, and Texas are the top

five states in terms the number of hospitals in the sample. It should be noted that we drop some observations from the dataset if the financial statements are not available or incomplete. This could be due to the transition to the new reporting formats and other reporting requirements in 2010 (Gray & Schlesinger, 2009). For example, Maryland has only one observation in 2010 comparing to 15 observations in 2009, and we will control for this using state fixed-effects.

Table 2. Number of hospitals in each state and year

State \ Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AK	10	11	12	14	13	11	12	10	8	8	12	15	7
AL	76	72	79	79	74	71	74	65	65	60	66	71	54
AR	54	61	63	60	68	70	63	60	55	48	44	47	30
AZ	31	35	27	33	35	35	33	35	37	37	38	43	25
CA	251	266	261	258	227	239	260	233	224	225	233	241	131
CO	40	44	39	45	53	53	47	48	51	53	50	53	48
CT	30	32	30	28	31	32	32	32	32	31	30	31	32
DE	2	3	4	4	5	5	7	8	7	6	5	7	3
FL	115	126	126	134	140	138	134	129	130	130	132	128	92
GA	105	114	100	97	109	108	107	104	105	110	106	106	58
HI	11	10	17	19	17	16	19	19	20	19	20	20	3
IA	83	86	79	71	64	65	72	75	73	86	93	89	16
ID	31	30	34	34	38	30	29	36	37	38	37	36	30
IL	106	107	114	102	101	102	105	109	106	104	105	112	64
IN	71	73	66	54	62	63	61	72	72	80	75	70	45
KS	91	84	89	96	106	98	105	114	117	118	117	118	99
KY	62	66	64	65	67	71	69	68	70	70	75	78	39
LA	82	84	85	87	93	96	96	94	98	97	102	110	76
MA	50	49	42	48	53	55	58	61	60	57	56	61	58
MD	22	29	28	26	22	20	20	21	19	17	19	15	1
ME	30	28	27	28	25	30	28	25	24	24	26	33	20
MI	92	85	95	95	101	94	89	86	87	89	86	83	57
MN	89	88	93	93	76	80	91	85	83	83	82	87	70
MO	76	71	78	75	74	74	75	73	71	79	84	82	50
MS	59	70	59	70	69	71	72	76	71	73	76	72	65
MT	38	43	43	42	39	40	43	43	44	46	43	43	14
NC	65	56	61	65	68	66	64	68	71	72	72	73	70
ND	34	31	34	31	26	27	35	37	36	36	36	34	16

NE	77	65	50	44	62	64	61	65	73	69	76	74	23
NH	21	23	23	16	16	18	18	21	22	21	23	21	16
Table 2, continued													
NJ	60	62	68	60	66	58	61	68	67	63	60	60	58
NM	28	26	23	22	20	23	27	30	30	32	28	27	15
NV	15	19	17	19	18	17	18	16	19	26	32	32	21
NY	138	137	142	141	145	148	144	137	143	150	144	147	141
OH	116	135	129	117	116	122	124	124	124	129	127	124	105
OK	62	64	63	67	65	54	49	59	75	83	91	103	50
OR	38	36	35	38	41	40	35	40	46	46	47	47	31
PA	129	134	141	149	145	144	136	138	142	142	142	142	20
PR	23	23	19	21	26	31	31	26	23	28	27	27	24
RI	6	6	8	9	8	7	8	7	6	6	8	8	9
SC	33	33	33	38	39	42	46	50	49	49	50	52	45
SD	27	26	36	35	41	41	43	35	34	37	39	41	17
TN	77	74	80	78	82	88	84	89	82	80	90	89	36
TX	236	233	227	250	246	249	244	271	265	253	251	251	181
UT	34	31	30	29	33	33	34	36	36	35	36	37	29
VA	67	68	61	62	61	56	61	58	59	64	63	63	42
VT	13	11	11	12	11	13	13	12	13	13	13	12	12
WA	77	81	73	68	73	66	74	76	80	84	84	79	56
WI	82	92	88	76	72	77	85	82	85	95	84	77	60
WV	45	50	46	39	36	43	48	41	41	43	41	40	27
WY	14	17	13	13	19	17	18	15	14	15	17	16	5

We first need to construct a variable that measures a hospital's earnings management to determine the extent to which hospitals executives are manipulating their financial performance. Prior studies of earnings management examine the use of discretionary accruals to produce financial reports that may over- or under-state a company's business activities and financial position. The models used in these studies range from the simple, in which the change in total accruals is used as a measure of discretionary accruals to the relatively sophisticated, which decompose accruals into discretionary and non-discretionary components using regression analysis. Managers cannot alter non-discretionary accruals to manage earnings because they reflect the fluctuation of business operations. Healy (1985) proposes a simple method to estimate non-

discretionary accruals by comparing mean total accruals (scaled by lagged total assets) across the earnings management partitioning variable. Similarly, DeAngelo (1986) computes first differences in total accruals and assumes that the first differences have an expected value of zero under the null hypothesis of no earnings management. It is noted that both Healy (1995) and DeAngelo (1986) are built on the assumption that non-discretionary accruals are constant. Jones (1991) relaxes this assumption by controlling for the effects of changes in a firm's economic circumstances on non-discretionary accruals. Discretionary accruals are calculated as the residual of the difference between total accruals and the predicted level of non-discretionary accruals. In this paper we will use the method proposed by Jones (1991) to estimate discretionary accruals.

Table 3. Variable definitions

Variable Name	Definition
Discretionary Accrual (Jones Model)	Jones (1991)
Natural log of Total Assets	log (Total Assets)
Financial Leverage	Total Liabilities ÷ Total Assets
Total Margin	Net Income ÷ Revenue
Asset Turnover (Sales to Assets)	Revenue ÷ Total Assets
Current Ratio	Current Assets ÷ Current Liabilities
Working Capital To Total Assets	(Current Assets – Current Liabilities) ÷ Total Assets
Days Cash On Hand	(Cash + Cash Equivalents) × 365 ÷ Operating Expenses
Days of Patient Receivables Outstanding	(Accounts Receivable – Allowances for uncollectible) × 365 ÷ Revenue
Fixed Asset Age (Year)	Accumulated Depreciation ÷ Annual Depreciation Expense
Salary to Revenue	Salary Expense ÷ Revenue
Government-owned	1 for government owned hospitals and 0 otherwise
Not-for-profit	1 for nonprofit hospitals and 0 otherwise

To study the determinants of hospital earnings management, we include the following determinant variables that measure hospital size (*Natural log of Total Assets*), debt level (*Financial Leverage*), profitability (*Total Margin*), asset liquidity (*Current Ratio*, *Working Capital To Total Assets*, and *Days Cash On Hand*), operating efficiency (*Asset Turnover*, *Days of Patient Receivables Outstanding*, *Fixed Asset Age*), and labor costs (*Salary to Revenue*).

This paper focuses upon assessing the economic determinants of hospital earnings management behavior by conducting pooled cross-sectional OLS regressions that relates discretionary accruals to various hospital financial characteristics. The regression model takes the following form:

$$\begin{aligned} DiscretionaryAccruals_{i,t} &= \beta_0 + \beta_1 Size_{i,t} + \beta_2 Leverage_{i,t} \\ &+ \beta_3 Profitability_{i,t} + \beta_4 Liquidity_{i,t} + \beta_5 Efficiency_{i,t} \\ &+ \beta_6 GovernmentOwn_{i,t} + \beta_7 NonProfit_{i,t} + \varepsilon_{i,t} \end{aligned}$$

The dependent variable is the discretionary accruals of hospital *i* in year *t*, Here the discretionary accruals is estimated by the Jones (1991) model. The main predictor variables are *Natural log of Total Assets*, *Financial Leverage*, *Total Margin*, *Asset Turnover*, *Current Ratio*, *Working Capital To Total Assets*, *Days Cash On Hand*, *Days of Patient Receivables Outstanding*, *Fixed Asset Age*, and *Salary to Revenue*. It is well known that managers in for-profit, public and non-profit hospitals have different incentives to avoid negative net income (Eldenburg et al., 2011). Earnings management behavior in for-profit hospitals is simply driven by contractual and capital market pressures, whereas it is more likely for reputation concerns among public hospitals. Non-profit hospitals are special because they do not have a profit-maximization objective and they do not receive government funding. Their motivation for earnings management is mainly for tax-avoidance and financial

sustainability (Leone & Van Horn, 2005). To control for this hospital ownership effect, we create two dummy variables: *Government-owned* and *NotProfit*. The value of *Government-owned* is one for public hospitals and zero otherwise. Similarly, the value of *NotProfit* is one for non-profit hospitals and zero otherwise. This will imply that the values of both variables (*Government-owned* and *NotProfit*) are zero for for-profit hospitals.

RESULTS

The summary statistics of all variables are shown in Table 4. The average discretionary accruals measured by the Jones (1991) model is -0.04 with the minimum and maximum values being close to -1.0 and 1.0.

Table 4. Summary statistics

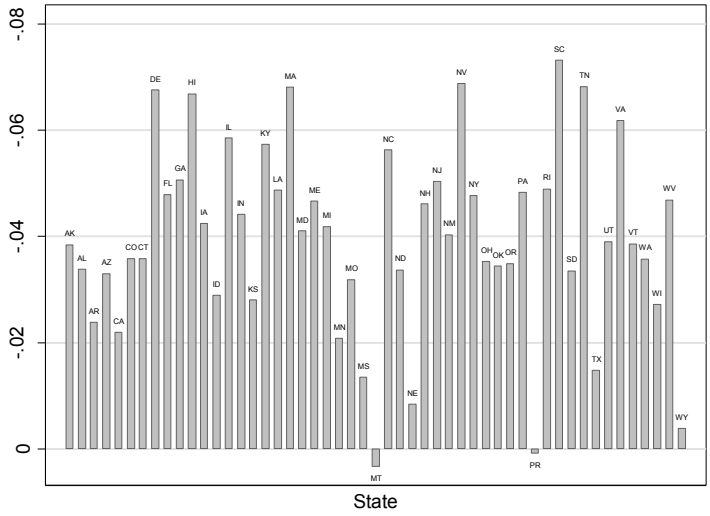
Variable	Mean	Standard Deviation	Minimum	Maximum
Discretionary Accrual (Jones Model)	-0.0377	0.348	-1.24	1.28
Natural log of Total Assets	17.3	1.589	7.96	22.5
Financial Leverage	0.591	0.544	0.0286	3.66
Total Margin	0.0273	0.107	-0.433	0.329
Asset Turnover (Sales to Assets)	1.37	0.939	0.269	6.79
Current Ratio	2.89	3.12	0.148	23.5
Working Capital To Total Assets	0.141	0.302	-1.46	0.834
Days Cash On Hand	42.4	63.7	0.00886	391
Days of Patient Receivables Outstanding	64.9	34.9	12.9	299
Fixed Asset Age	13.9	19.7	0.146	175
Salary to Revenue	0.438	0.126	0.209	1.06
Government-owned	0.238	0.426	0	1
Not-for-profit	0.543	0.498	0	1

We break down the sample based on hospital location and plot the distribution of discretionary accruals by state in Figure 1. The histograms show that hospitals in most states, except Montana and Puerto Rico, adopted a negative earnings management strategy to report lower

profits. This can well be the case of "saving today for a better tomorrow". Still, it is likely that hospitals use negative earnings management as a way to deflect the public's attention as in the case of politically connected institutions (Guay, 2010), or simply to signal a high cost of providing charity care (to retain tax-exempt status). There are also a number of patterns in aggregate discretionary accruals over time (Figure 2). The prevalence of this accounting strategy is lowest during the boom period of 2002-2006 (except in 2005) and highest immediately following the financial crisis in 2008-2010.[4] This result is in sharp contrast to the decline in accrual based earnings management in for-profit firms after the enactment of Sarbanes-Oxley Act (SOX) in 2002, as evidenced in the recent financial accounting literature (e.g., Cohen et al., 2008).

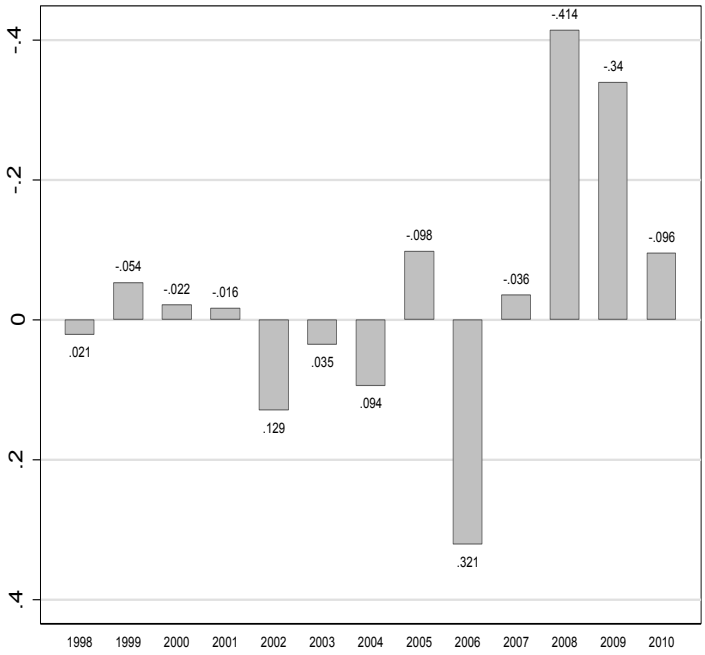
[4] We reverse the direction of Y axis of so that higher values of discretionary accruals correspond to more negative earnings management.

Figure 1. Discretionary accruals across states



The average hospital size is $32.6 million with the largest being $5.9 billion in total assets. The total liabilities of an average hospital is about 59% of its total assets. The highest financial leverage of 366% suggests that some hospitals in our sample are in severe financial distress. On average, the total profit margin is 3% with the most profitable hospital making $30 net income out of $100 revenue. Interestingly, labor cost constitutes only a relatively small portion, roughly 14%, of the total revenue. The average current ratio is 2.89 and the average working capital is 14.1% of the total assets. It takes about 42 days for an average hospital to exhaust all of its cash and 65 days to collect its patient service revenue, and the average fixed asset age is 14 years.

Figure 2. Discretionary accruals over time



The Pearson's correlations are reported in the lower-left triangle of Table 5. An examination of the correlation matrix indicates that correlations between independent variables are generally small. This low correlation among the covariates helps prevent the problem of multicollinearity that causes high standard errors and low significance levels when both variables are included in the same regression. However, there are four pairs of variables having correlations above or close to ±0.5: *Government-owned* and *Not-for-profit* (-0.61), *Current Ratio* and *Working Capital to Total Assets* (0.52), *log(Total Assets)* and *Asset Turnover* (-0.51), and *Financial Leverage* and *Working Capital to Total Assets* (-0.49). The Spearman's correlation matrix in the upper-right triangle of Table 5

confirms the strong correlations of the first and second pairs of independent variables. To be cautious, we will exclude *Asset Turnover* and *Working Capital to Total Assets* in some of the regression specifications to avoid potential multicollinearity problems.

Table 6 provides the results of the coefficient estimates for the statistical relationship between earnings management and hospital characteristics with year and state fixed effects. The dependent variable in all specifications is the hospital's discretionary accruals which is measured by the Jones (1991) model. In specifications (1) and (2), hospitals with higher profit margin, current ratio, days of patient receivables outstanding, and wage cost are associated with higher discretionary accruals, whereas those with larger asset size, financial leverage, days cash on hand, fixed asset age are associated with lower discretionary accruals. Nonprofit hospitals are more likely to manage earnings and public hospitals are less likely to do so. In specifications (3) and (4) we add a new variable *Asset Turnover* which indicates how efficiently the hospital generates patient service revenue on each dollar of total assets and its coefficient estimate is negative in both regression models. In specifications (5) to (6), we add another variable *Working Capital to Total Assets* that measures the amount of current assets required to run the daily operations and often serves as a predictor for financial distress or bankruptcy. The positive coefficient estimate suggests that earnings management is more prevalent at hospitals with better financial health.

Table 5. Correlation matrix

The upper-right triangle is the Spearman's correlations matrix and the lower-left triangle is the Pearson's correlation matrix.

	Natural log of Total Assets	Financial Leverage	Total Margin	Asset Turnover (Sales to Assets)	Current Ratio	Working Capital To Assets	Days Cash On Hand	Days of Patient Receivables Outstanding	Fixed Asset Age	Salary to Total Revenue	Government-owned	Not-for-profit
Natural log of Total Assets		-0.04	0.14	-0.14	0.02	-0.13	0.04	-0.13	0.05	-0.31	-0.24	0.32
Financial Leverage	-0.18		-0.28	0.31	-0.48	-0.39	-0.21	-0.03	-0.14	-0.01	-0.18	-0.02
Total Margin	0.18	-0.22		-0.15	0.29	0.22	0.16	-0.10	-0.09	-0.36	-0.03	-0.04
Asset Turnover	-0.51	0.40	-0.02		-0.22	-0.05	-0.43	-0.21	-0.17	-0.25	-0.23	-0.14
Current Ratio	-0.03	-0.25	0.16	-010		0.86	0.35	0.13	-0.03	-0.12	0.14	-0.09
Working Capital To Assets	-0.00	-0.49	0.20	-0.09	0.52		0.39	0.16	0.02	-0.03	0.17	-0.09
Days Cash On Hand	0.07	-0.19	0.13	-0.23	0.40	0.35		-0.01	0.15	0.14	0.21	0.16
Days Receivables Outstanding	-0.08	-0.00	-0.15	-0.15	0.07	0.07	0.07		0.03	0.17	0.13	-0.10
Fixed Asset Age	0.07	-0.04	-0.05	-0.06	-0.04	0.01	0.07	0.22		0.26	0.16	0.24
Salary to Revenue	-0.27	-0.02	-0.42	0.00	0.01	0.00	0.06	0.22	0.12		0.26	0.07
Government-owned	-0.23	-0.15	-0.07	-0.06	0.09	0.14	0.14	0.09	0.04	0.25		-0.60
Not-for-profit	0.31	-0.11	-0.05	-0.18	-0.08	0.00	0.05	-0.08	0.13	0.03	-0.61	

Table 6. Regressions of hospital earnings-management and financial characteristics

The dependent variable is discretionary accrual estimated using the Jones (1991) model. The independent variables include the natural log of total assets, financial leverage, total margin, asset turnover (sales to asset), current ratio, working capital to total assets, days cash on hand, days of patient receivables outstanding, fixed asset age, total salary to revenue, and two dummy variables of ownership: public and nonprofit. All specifications use OLS regressions with year and state fixed-effects. z-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable: Discretionary Accrual	(1)	(2)	(3)	(4)	(5)	(6)
Natural log of Total Assets	0.0017*	0.0012	-0.0017	-0.0021*	-0.0029***	-0.0026**
	(1.71)	(1.220)	(-1.47)	(-1.76)	(-2.59)	(-2.32)
Financial Leverage	-0.037***	-0.036***	-0.032***	-0.031***	0.033***	0.039***
	(-13.85)	(-13.15)	(-11.55)	(-11.02)	(11.11)	(10.80)
Total Margin	0.104***	0.107***	0.114***	0.117***	0.094***	0.092***
	(7.38)	(7.59)	(8.06)	(8.226)	(6.832)	(6.600)
Asset Turnover (Sales to Assets)			-0.010***	-0.010***	-0.026***	-0.026***
			(-5.41)	(-5.337)	(-14.13)	(-14.19)
Current Ratio	0.015***	0.015***	0.015***	0.015***	0.0055***	0.0054***
	(31.96)	(32.03)	(32.02)	(32.08)	(11.03)	(10.85)
Working Capital To Total Assets					0.283***	0.283***
					(51.01)	(51.00)
Days Cash On Hand	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0004***	-0.0004***
	(-7.03)	(-7.26)	(-7.87)	(-8.05)	(-17.35)	(-17.01)
Days of Patient Receivables Outstanding	0.0006***	0.0006***	0.0005***	0.0006***	0.0004***	0.0004***
	(14.23)	(14.37)	(13.07)	(13.20)	(9.54)	(9.31)
Fixed Asset Age	-9.17e-05	-0.0001	-6.83e-05	-8.86e-05	-2.09e-05	-5.59e-06
	(-1.34)	(-1.64)	(-0.99)	(-1.28)	(-0.31)	(-0.08)
Salary to Revenue	0.039***	0.035***	0.038***	0.034***	0.064***	0.067***
	(3.08)	(2.68)	(2.99)	(2.62)	(5.16)	(5.33)
Government-owned	-0.0043	0.0017	-0.0061*	-0.0007	-0.0142***	-0.0183***
	(-1.22)	(0.38)	(-1.75)	(-0.15)	(-4.19)	(-4.13)

Not-for-profit		0.0082** (2.06)		0.0074* (1.86)		-0.0055 (-1.43)
Constant	-0.089*** (-3.04)	-0.087*** (-2.96)	-0.016 (-0.50)	-0.015 (-0.47)	-0.029 (-0.93)	-0.030 (-0.96)
Year Fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
N	42,573	42,573	42,573	42,573	42,573	42,573
Adj. R-squared	0.324	0.324	0.325	0.325	0.364	0.363
F- Test	288***	284***	285***	281***	334***	329***
Mean VIF	5.40	5.37	5.36	5.34	5.32	5.30

Together, these results provide direct evidence that asset size, profitability, asset liquidity, operating efficiency, labor cost, and ownership are important economic factors of hospital earnings management. The Variance Inflation Factor (VIF) is calculated for each independent variable to determine if these variables display collinearity amongst themselves. The mean VIFs (ranging from 5.30 to 5.40) reported at the bottom of Table 6 are below the cut-off point of ten (Myers 2000), suggesting no problem with multicollinearity in our regressions.

In additional sensitivity tests, we use alternative measures of earnings management and hospital characteristics in our analyses. The Jones (1991) model implicitly assumes that revenues are non-discretionary and therefore extracts the discretionary components of accruals; however, this assumption biases the estimate toward zero earnings management. Recognizing this limitation, Dechow, et al. (1995) modifies the Jones Model to eliminate the estimation error by deducting account receivables from revenues. We construct a new measure of discretionary

accruals using the so-called Modified Jones Model and report the Pearson's and Spearman's correlations of both earnings-management measures in the Section A of Table 7. The strong correlation (0.82 in Pearson's and 0.83 in Spearman's) is not really surprising, given the fact that the only major difference between the Jones Model and the Modified Jones Model is the consideration of the change in receivables while calculating the change in revenues.

Table 7. Alternative measures of earnings-management and hospital characteristics

Section A. Correlations (The upper-right triangle is the Spearman's correlations matrix and the lower-left triangle is the Pearson's correlation matrix.)

Alternative measure of hospital earnings management:

	Discretionary Accrual in Jones Model	Discretionary Accrual in Modified Jones Model
Discretionary Accrual in Jones Model		0.83
Discretionary Accrual in Modified Jones Model	0.82	

Alternative measures of hospital size:

	Natural log of Total Assets	Patient Days	Number of Discharges	Number of Beds
Natural log of Total Assets		0.81	0.86	0.78
Total Patient Days and Visits (in thousands)	0.72		0.93	0.86
Number of Discharges (in thousands)	0.76	0.96		0.84
Number of Beds (in thousands)	0.72	0.91	0.89	

Alternative measure of hospital profitability:

	Total Margin	Total Margin to Total Assets
Total Margin		0.88
Total Margin to Total Assets (in millionth)	0.68	

Alternative measure of hospital labor costs:

	Salary to Revenue	Salary to Patients Days and Visits
Salary to Revenue		0.20
Salary to Patients Days and Visits (in thousands)	0.19	

Section B. Regressions

The dependent variable is discretionary accrual estimated using the Jones (1991) model in specifications (1) to (3) and discretionary accrual estimated using the modified Jones model (Dechow et al., 1995) in specifications (4) to (6). The independent variables include total patient days and visits, number of discharges, number of beds, financial leverage, total margin to assets, asset turnover (sales to asset), current ratio, working capital to total assets, days cash on hand, days of patient receivables outstanding, fixed asset age, total salary to total patient days and visits, and two dummy variables of ownership: public and nonprofit. All specifications use OLS regressions with year and state fixed-effects. z-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable: Discretionary Accrual	(1)	(2)	(3)	(4)	(5)	(6)
Total Patient Days and Visits	0.00056*** (12.40)			0.00028*** (6.98)		
Number of Discharges		0.0032*** (14.05)			0.0016*** (7.69)	
Number of Beds			0.148*** (14.18)			0.0832*** (8.95)
Financial Leverage	0.0119*** (3.46)	0.0126*** (3.65)	0.0122*** (3.54)	0.0235*** (7.66)	0.0237*** (7.74)	0.0237*** (7.75)
Total Margin to Total Assets	0.768*** (7.60)	0.773*** (7.65)	0.768*** (7.60)	0.545*** (6.07)	0.550*** (6.12)	0.546*** (6.07)
Asset Turnover (Sales to Assets)	-0.0076*** (-10.34)	-0.0075*** (-10.18)	-0.0075*** (-10.18)	-0.0127*** (-19.49)	-0.0127*** (-19.39)	-0.0127*** (-19.37)
Current Ratio	0.0064*** (11.00)	0.0065*** (11.30)	0.0064*** (11.10)	0.0049*** (9.48)	0.0048*** (9.64)	0.0049*** (9.57)
Working Capital To Total Assets	0.279*** (43.66)	0.278*** (43.63)	0.279*** (43.71)	0.284*** (50.09)	0.284*** (50.04)	0.284*** (50.10)
Days Cash On	-0.0004***	-0.0004***	-0.0004***	-0.0004***	-0.0004***	-0.0004***

Hand	(-14.78)	(-14.74)	(-14.45)	(-16.97)	(-16.97)	(-16.73)
Days of Patient Receivables Outstanding	0.0003*** (6.79)	0.0003*** (7.18)	0.0003*** (6.75)	0.0003*** (7.89)	0.0003*** (8.07)	0.0003*** (7.95)
Fixed Asset Age	-0.0003*** (-4.39)	-0.0003*** (-4.51)	-0.0004*** (-4.66)	-0.0002*** (-3.50)	-0.0002*** (-3.55)	-0.0003*** (-3.72)
Salary to Patients Days and Visits	0.0007 (0.52)	0.0006 (0.48)	-0.0003 (-0.26)	-0.0002 (-0.22)	-0.0003 (-0.26)	-0.0006 (-0.56)
Government-owned	-0.049*** (-9.80)	-0.050*** (-9.85)	-0.049*** (-9.77)	-0.034*** (-7.72)	-0.035*** (-7.75)	-0.035*** (-7.69)
Not-for-profit	0.014*** (3.25)	0.017*** (3.86)	0.015*** (3.41)	0.008** (2.13)	0.009** (2.44)	0.009** (2.33)
Constant	0.0110 (0.41)	0.0099 (0.36)	0.0049 (0.18)	0.0040 (0.16)	0.0036 (0.15)	-0.0004 (-0.01)
N	42,573	42,573	42,573	42,573	42,573	42,573
Adj. R-squared	0.253	0.254	0.254	0.266	0.266	0.267
F- Test	205.64***	206.39***	206.50***	220.18***	220.33***	220.75***
Mean VIF	5.30	5.30	5.30	5.30	5.30	5.30

In terms of other measures of hospital size besides the natural log of total assets, we collect the total patient days and visits (in thousands), total number of discharges (in thousands), and total number of beds (in thousands) from the CMS Cost Reports. Again, the correlations among four different measures of hospital size are above 0.70 in both Pearson's and Spearman's coefficients. We further adjust the profit margin and salary expenses by total assets and total patient visits respectively to increase the cross-sectional comparability of hospital profitability and labor costs, and report the regression results in the Section B of Table 7. Discretionary accruals are estimated using the Jones Model in specifications (1) to (3) and the Modified Jones Model in specifications (4) to (6). Most coefficient

estimates are broadly consistent with those of our previous results in Table 6, and the effect of financial leverage on earnings management remain positive across all six specifications and the negative effect of fixed assets ages turns statistical significant.

DISCUSSION AND CONCLUSION

The annual financial statement data of hospitals that filed Medicare Cost Reports between 1997 and 2010 show that hospitals often adopted a negative discretionary accruals strategy that is to book a negative accrual to bring down the net income when actual earnings are above target in the hope of being able to reverse the accrual in a subsequent year when actual earnings are below target. This is in contrast to the common practice of using discretionary accruals to maintain earnings momentum in for-profit firms.

An important feature of the present study is the inclusion of hospital characteristics that may influence the choice of accounting methods. We find that hospital size, profitability, asset liquidity, operating efficiency, labor cost, and ownership appear to be important economic factors of earnings management. Specifically, hospitals with higher profit margin, current ratio, working capital, days of patient receivables outstanding, and total wage are associated with higher discretionary accruals, whereas those with larger asset size, financial leverage, asset turnover, days cash on hand, fixed asset age are associated with lower discretionary accruals. More interestingly, nonprofit hospitals are more likely to manage earnings and public hospitals are less likely to do so. Together, these results provide direct evidence of the use of discretionary accruals to manage earnings among U.S. hospitals. It is worth emphasizing the subtle difference between manipulating discretionary accruals within the bounds of generally accepted accounting principles (GAAP) and committing

accounting fraud (e.g., overstatement of earnings via revenue, expenses, or accounts receivables, as the case of HealthSouth quoted at the beginning of this article), and there is evidence showing the predictive power of earnings management in detecting actual cases of fraudulent and restated earnings.[5]

The findings reported in this study have profound policy implications in terms of assessing the pervasiveness of accounting manipulation and the overall integrity of financial reporting in this very special sector that provides public and quasi-public services. Still, this paper leaves us with an open question: to what extent will the hospital executive compensation contract affect earnings manipulation as the stock options seem to have done to fraudulent accounting practices in publicly traded for-profit companies and large financial institutions? However, because most of the hospitals in our sample are not-for-profit and public, the answer will depend on what role the bonus schemes rather than stock options are playing in accounting procedure and accrual decisions.[6] Of course, to answer this question would involve the massive and difficult task of collecting executive compensation data from various data sources. We will leave such issues for future research.

[5] For example, see Jones et al.(2008).
[6] See Healy (1985) and Kaplan (1985) for more details on this subject.

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