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Evaluating Earnings Management in Taiwan's Nonprofit Hospitals Using Cross-Sectional Abnormal Items Models

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Abstract

The purpose of this paper is to examine whether earnings management in the non profit hospitals of Taiwan and analyze the earnings management behavior. We developed and tested the standard-Jones, modified-Jones, BD (abnormal bad debt), WCA (abnormal working capital), NORR (abnormal non-operating or non-revenue generating activity expenditure), and NGSP-models (abnormal net gain on the sale of property) to estimate the amount of abnormal accrual items or abnormal real items. Empirical evidence suggested that the BD, NORR and NGSP models may be used to determine levels of earnings management. Thus, these models are ideal for determining how Taiwan's nonprofit hospitals manage their earnings.

Keywords: Non-profit organization, Earnings management, Hospitals, Taiwan

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1. Introduction

Non-profit organizations are generally perceived to not have profit maximization as their operational goal because profit is not their critical concern (Tan, 2011). There are fundamental differences between nonprofit organizations and for-profit entities. For example, because nonprofit organizations do not aim to generate profit, the majority of the revenue generated goes directly to the organization's services (Silverbo, 2004). Typically, nonprofit managers ensure that public funds are used efficiently and effectively (Ben-Ner and Gui, 2003). Nonprofit use of non-distribution constraint reduces the likelihood that public funds will be used for private gain (Weisbrod, 1988). Instead the focus is on community health needs and social capital growth (Bryce, 2005).

However, managers of nonprofits organizations have also been increasingly concerned about managing organizational performance (Speckbacher,2003; Ritchie and Kolodinsky, 2003; Green and Griesinger,1996; Bielefeld,1992; Kaplan,2001; Kirk & Nolan, 2010; Calabrese,2013; Buteau et al.,2014) and have suggested that nonprofit organizations focus on financial performance indicators, such as fundraising efficiency, public support, and fiscal performance (Ritchie and Kolodinsky 2003) because boards typically engage in resource-related activities including fundraising and making personal financial contributions (Green and Griesinger, 1996) or donations(Li et al.,2012; Yetman & Yetman,2013); Cost Efficiency(Hughes,2013)

Besides it, like other types of donor-based non-profit organizations, non-profit hospitals engage in business operations to maintain organizational sustainability while delivering social welfare. Thus, managers of non-profit hospitals also must consider the organization's financial performance (Tan, 2011; Singh & Wheeler, 2012). This includes performing credit evaluations (Leone and Van Horn,2005), managerial assessments (Leone and Van Horn,2005), making donation decisions (Frank et al.1990; Leone and Van Horn,2005; Tan,2011), contract negotiations (Leone and Lawrence,2005), determining tax status (Krishnan and Yetman,2011; Leone and Van Horn,2005; Eldenburg et al.2011 Tan,2011), the level of governmental supervision (Tan,2011), regulatory scrutiny (Eldenburg et al.2011; Eldenburg et al. 2004), obligations to stakeholders (Eldenburg ET al.2011) ; fundraising (Erwin, 2013)

Nonprofit hospitals are also reported to make accounting adjustments to avoid small losses (Ballantine et al.2007; Leone and Van Horn,2005; Frank et al.1990; Hoerger,1991; Leone and Van Horn, 2005; Eldenburg et al. 2011; Eldenburg et al. 2004; Tan, 2011), break even (Ballantine et al.2007), near zero (Ballantine et al.2008; Chang and Tuckman, 1990), achieve decreased earnings (Leone and Van Horn, 2005; Eldenburg et al. 2004), and avoid large positive net incomes (Eldenburg et al.2011). Additionally, many nonprofit hospitals are known to adjust discretionary accruals (Leone and Van Horn,2005; Ballantine et al. 2007; Eldenburg et al. 2004; Tan, 2011), manipulate real activities (Eldenburg et al. 2011; Hoerger, 1991; Leone and Van Horn, 2005; Krishnan and Yetman, 2011) and meet earnings objectives.

An important issue in nonprofit hospital financial reporting is the extent to which managers manipulate reported earnings. Accrual and real activities-based measures are now widely employed in earnings management. The most frequently used techniques for achieving this separation are the standard Jones[2] (Leone and Van Horn, 2005), modified Jones[3] (Tan, 2011), BD[4] (Leone and Van Horn, 2005), WCA (Ballantine et al. 2007), NORR[5] (Eldenburg et al. 2011) and NGSP models[6] (Eldenburg et al. 2011).

Regarding earnings management in NFP hospitals in Taiwan, Tan (2011) investigated whether earnings management occurred in NFP hospitals using financial data manually collected from foundation hospitals in Taiwan between 2006 and 2008. By examining the distribution of reported income for a sample of 45 hospitals, based on the results of 133 annual reports, Tan observed that NFP hospitals tend to manage their earnings at just above zero. That study also found that hospitals that receive donations from religious and business groups tend to manage earnings to a range just above zero. By contrast, Huang and Liu (2011) used non-profit proprietary hospitals in Taiwan and the ordinary least squares method to test their hypothesis regarding earnings management behavior (that is, discretionary accruals play an active role in earnings management). The empirical results indicated that CEO duality (CEOs also serving as chairmen) is negatively related to earnings management. Thus, regarding earnings management, evidence suggests that the behavior of NFP hospitals is similar to that of FP organizations.

Because the optimal earnings management model for NFP hospitals in Taiwan remains unclear in related literature. We develop and test an optimal model is evaluated in terms of specification[7] (i.e., the probability of a Type I error) and power[8] (i.e., the probability of a Type II error). The remainder of the paper is organized as follows. Section 2 presents a brief review of the related literature. Section 3 provides details of the research design and sample selection procedure and develops our alternative model for estimating optimal earnings management. Section 4 presents our empirical findings. Section 5 contains a summary and conclusions.

2. Literature Review

Nonprofit hospitals adjust discretionary items to meet earnings objectives. Hoerger (1991) predicted and found that nonprofit hospitals minimize the variance in reported earnings because they attempt to achieve a target level of earnings that satisfies the budget constraint. This suggests that managers can increase or decrease discretionary spending near the year's end to get closer to desired profit levels. Ballantine et al. (2007) used discretionary accrual models to show that English NHS hospitals reported profit and achieved the financial break-even point. Eldenburg et al. (2011) determined earnings management in nonprofit hospitals through assessing their management of accruals and use of real activities (non-revenue-generating activities) to avoid reporting earnings that fall below or well above the zero-profit benchmark. Furthermore, Krishnan and Yetman (2011) evaluate whether

[2] discretionary accruals
[3] discretionary accruals
[4] bad debts
[5] non-operating and non-revenue-generating activity accounts expenditures
[6] Net gain on the sales of property
[7] Peasnell et al. (2000)
[8] Peasnell et al. (2000)

nonprofit hospital managers inflate program service expenses relative to fundraising, management, and general expenses, when program service expenses are described as being dedicated to any "activity of an organization that accomplishes its exempt purpose" (Internal Revenue Service 2010). Tan (2011) suggested that managers of nonprofit hospitals used discretionary accruals (estimated using aggregate accruals models and specific accruals models) to meet the earnings target. Ballantine et al. (2008), who studied public sector NHS Hospital Trusts in the United Kingdom, and Chang and Tuckman (1990), who examined nonprofit organizations in the United States, found that accrual management facilitates reported earning manipulation to achieve a low or no profit result. The different objectives of earnings manipulation may result in varying degrees of specification and power of discretionary items for earnings management.

3. Methods

The sample for this study was obtained from the Department of Health, Executive Yuan, and NFP hospitals (totaling 43) between 2005 and 2011 (sample size = 301). This study also adopted the regression method. A regression model was employed to analyze the data variables and research model used for this study; the results are described below.

3.1 Measuring Discretionary Accruals (DA_{it})

$$\frac{\Delta BD_{it}}{ASSET_{it-1}} = \frac{\beta_1}{ASSET_{it-1}} + \frac{\beta_2 \Delta NETREV_{it}}{ASSET_{it-1}} + \frac{\beta_3 \Delta MEDCARE_{it}}{ASSET_{it-1}} + \frac{\beta_4 \Delta MEDCAID_{it}}{ASSET_{it-1}} + \varepsilon_{it} \,.\ (1)$$ [9]

$$\frac{JACC_{it}}{ASSET_{it-1}} = \frac{\beta_1}{ASSET_{it-1}} + \frac{\beta_2 \Delta NETREV_{it}}{ASSET_{it-1}} + \frac{\beta_3 NPPE_{it}}{ASSET_{it-1}} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$ [10]

$$\frac{MJACC_{it}}{ASSET_{it-1}} = \frac{\beta_1}{ASSET_{it-1}} + \frac{\beta_2 \Delta SALES_{it} - \Delta AR_{it}}{ASSET_{it-1}} + \frac{\beta_3 GPPE_{it}}{ASSET_{it-1}} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots (3)$$ [11]

$$\frac{\Delta WC_{it}}{ASSET_{it-1}} = \frac{\beta_1}{ASSET_{it-1}} + \frac{\beta_2 CFO_{it-1}}{ASSET_{it-1}} + \frac{\beta_3 CFO_{it}}{ASSET_{it-1}} + \frac{\beta_4 CFO_{it+1}}{ASSET_{it-1}} + \frac{\beta_5 \Delta SALES_{it}}{ASSET_{it-1}} + \frac{\beta_6 NPPE_{it}}{ASSET_{it-1}} + \varepsilon_{it} \,..(4)12$$

$$\frac{\Delta EXPEND_{it}}{LASSET_{it}} = \beta_0 + \beta_1 DECREASE_{it} + \beta_2 INCREASE_{it} + \beta_3 NOPRED_{it} + \beta_4 ASSET_{it} + \beta_5 \frac{\Delta SALES_{it}}{LASSET_{it}} + \varepsilon_{it} \ \cdots (5)13$$

[9] Leone and Van Horn(2005), $DABD_{it}$ represents the discretionary of bad debt at time *t* using Model 1

[10] Leone and Van Horn(2005), DAJ_{it} represents the discretionary accruals of the Jones model (1991) at time *t* using Model 2

[11]Tan(2011), $DAMJ_{it}$ represents the discretionary accruals of the modified Jones model at time *t* using Model 3

[12]Ballantine et al.(2007), $DAWC_{it}$ represents the discretionary of working capital at time *t* using Model 4

$$GAIN_{it} = \beta_0 + \beta_1 BELOWZERO_{it} + \beta_2 ABOVEZERO_{it} + \beta_3 LASSET_{it} + \beta_4 \Delta SALES_{it} + \beta_5 GPPE_{it-1} + \varepsilon_{it} \cdots\cdots (6)$$ [14]

Discretionary items are frequently used in prior studies as a proxy for earnings management, for which the value of ε_{it} for measuring earnings management was adopted.

3.2 Model specification[15]

We evaluate model specification by examining the extent to which each of the six cross-sectional models incorrectly rejects the null hypothesis of no earnings management. This is achieved using the following simulation procedure:

(a) Estimate the first stage regressions for each of the six models for each hospital in year t

(b) Select 25 firms at random from year t and construct an indicator variable (PART) defined as one if the firm has been selected and zero otherwise;

(c) Randomize all observations in year t and compute abnormal discretionary items

(ADI) for each of the six models using the coefficient estimates obtained in (a);

(d) Estimate the following univariate regression for each measure of abnormal discretionary items $ADI_{it} = \alpha + \beta PART_{it} + \varepsilon_i$ and test whether the estimated coefficient on PART is significantly different from zero[16].

Steps (a)–(d) are then repeated 100 times for each sample year. Since observations at stage (b) are selected at random, they should not be characterized by any systematic earnings management activity. As such, a well specified model is not expected to reject the null hypothesis of b=0 at rates that significantly exceed the appropriate test statistic (e.g., five percent or one percent levels).

3.3 Power to detect earnings management[17]:

We assess the power of alternative cross-sectional abnormal discretionary items models by

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[13] Eldenburg et al.(2011), $DANGA_{it}$ represents the discretionary of non-operating or non-revenue-generating activity at time *t* using Model 5

[14] Eldenburg et al. (2011), $DAGSP_{it}$ represents the discretionary of net gain on property sales at time *t* using Model 6.

[15] Peasnell et al. (2000)

[16] A PART coefficient that is significantly different from 0 indicates that the selected firm (PART = 1) conducts earnings management (management involving increasing or decreasing earnings), whereas a PART coefficient that is not significantly different from 0 indicates no such management.

[17] Peasnell et al. (2000)

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examining their ability to detect earnings management activity when it is known to exist. This is achieved by adding a pre-determined amount of positive discretionary items to the reported accruals of a randomly selected set of firms and then examining the ability of the models to detect this artificial earnings management. The procedure is similar to that described above for testing general model specification with the exception that at stage (b), artificial earnings are added to the reported accruals for firms where PART equals[18]. As before, steps (a)–(d) are then repeated 100 times for each sample year. However, since the observations where PART equals one are now known to contain earnings management activity, we would expect a powerful model to reject the null hypothesis that b=0, in favor of the alternative that rates at $b \neq 0$ significantly exceed the specified test level (Type II errors test). All else equal, the higher the rejection frequencies associated with a particular model, the more powerful that model is deemed to be at detecting earnings management activity.

4. Results

4.1 Descriptive statistics

Table 2 shows[19] that the discretionary accruals of the modified Jones model and discretionary of net gain on property sales were negative, whereas discretionary of bad debt , discretionary accruals of the Jones model (1991), discretionary of working capital, and discretionary of non-operating or non-revenue-generating activity were positive. The results also showed that the discretionary accruals of the modified Jones model and discretionary accruals of net gain on property sales were income-decreasing performance-adjusted discretionary items. The discretionary accruals of bad debt, discretionary accruals of the Jones model (1991), discretionary accruals of working capital, and discretionary accruals of non-operating or non-revenue-generating activity show that income-increasing performance adjusted the discretionary items of NFP hospitals in Taiwan.

Tables 3 to 8 present descriptive statistics for the discretionary item models. Because the standard-Jones model (Table 4) and modified Jones model (Table 5) are equivalent at the estimation stage, their coefficients in ΔREV are positive from 2005 to 2011. However, the

[18]As such, the parameter estimates from the first stage regressions in part (a) are not contaminated by the artificially induced earnings. As explained in Footnote 15, a PART coefficient that is significantly different from 0 indicates the existence of earnings management, with PART = 1, whereas in firms without earnings management, PART = 0.

[19]Chen et al. (2011) indicated that ε_{it} is categorized into two groups[19]: a positive ε_{it} denotes that income-increasing performance-adjusted discretionary items and a negative ε_{it}denotes that income-decreasing performance-adjusted discretionary items.

ΔREV magnitudes are typically considerably low, ranging from a high of 0.442 in 2011 to a low of -0.086 in 2006. Moreover, the adjusted R-squared statistics ranged from a maximum of 33.5% in 2006 to a minimum of 9.8% in 2009. Compared to the Jones model, Table 5 (modified Jones model) also shows that the $\Delta SALES_{it}$ - ΔAR_{it} coefficient, representing changes in medical revenue minus the changes in account receivables, is positive for each year. The average $\Delta SALES_{it}$ - ΔAR_{it} magnitude is typically higher than that of the Jones model, ranging from a high of 0.551 in 2007 to a low of 0.285 in 2008. Moreover, the adjusted R-squared statistics ranged from a minimum of 12.5% in 2007, to a maximum of 34.1% in 2010. Thus, on average, the modified Jones model (Table 5) has greater explanatory power than the Jones model (Table 4) does. However, Table 6 (working capital model) shows that the adjusted R-squared statistics ranged from a minimum of 39.5% in 2007, to a maximum of 55.8% in 2010. On average, the working capital model was more effective than the Jones model and modified Jones model in measuring abnormal discretionary accrual items. In addition, the CFO_{it-1} coefficient was negative and the CFO_{it+1} was positive, suggesting that when the previous year does not have sufficient cash flow, Taiwan's nonprofit hospitals may conduct earnings management to maintain cash flow. We also discovered that when the following year has sufficient cash flow, the managers of Taiwan's nonprofit hospitals also conduct earnings management to protect against temporary fluctuation. Ballantine et al. (2007) show that the CFO_{it-1} coefficient is non-significant; it is unclear whether the CFO_{it+i} coefficient is positive or negative. These results highlight the differences between Taiwan's and England's hospitals. We adopted three models to measure abnormal real discretionary items (bad debt model, non-operating or non-revenue-generating model, net gain on property sales model). Table 3 (bad debt model) shows that the ΔREV coefficient was positive each year except 2011, which was equivalent to the Jones model. The average magnitude of ΔREV ranged from -0.125 in 2006, to 0.417 in 2011. Moreover, the adjusted R-squared statistics ranged from 27.9% in 2011, to 52.1% in 2010. Table 7 (non-operating or non-revenue-generating model) shows that the adjusted R-squared statistics ranged from 26.6% in 2005, to 36.5% in 2011. The $INCREASE_{it}$ and $NOPRED_{it}$ coefficients were positive. Eldenburg et al. (2011) showed that the $INCREASE_{it}$ and $NOPRED_{it}$ coefficients were non-significant. However, Table 8 (net gain on property sales model) shows that the adjusted R-squared statistics ranged from 32.1% in 2005, to 51.4% in 2007. The $BELOWZERO_{it}$ and $ABOVEZERO_{it}$ coefficients were positive. Eldenburg et al. (2011) showed that the $BELOWZERO_{it}$ coefficient is non-significant and the

$ABOVEZERO_{it}$ coefficient is negative. Thus, in comparison to Eldenburg et al. (2011), we found that managers in Taiwan's hospitals tend to differ from managers in American hospitals.

4.2 Model specification

Results of the discretionary accruals of the Jones model, the discretionary accruals of the modified Jones model, the discretionary of bad debt, the discretionary of working capital, the discretionary of non-operating or non-revenue-generating activity and the discretionary of net gain on property sales model assessments are presented in Table 9. Type I errors from one-tailed tests are reported for both the null hypothesis that abnormal accruals are greater than or equal to zero (alternative hypothesis: income-decreasing earnings management) and the null hypothesis that abnormal accruals are less than or equal to zero (alternative hypothesis: income-increasing earnings management). Recall that since the sampling procedure helps ensure that firms where PART equals one are unlikely to be characterized by systematic earnings management activity, a well-specified model should not reject the null hypothesis of no earnings management at rates that significantly exceed the test level (e.g., 5% or 1%). Consistent dose not with the findings reported by Dechow et al.(1995), the frequency of Type I errors in table 9 corresponds to the specified test levels for only four models (the discretionary accruals of the Jones model, the discretionary of bad debt, the discretionary of non-operating or non-revenue-generating activity, the discretionary of net gain on property sales) in a binomial test fails to reject the null hypothesis that the observed rejection frequencies equal the specified test levels. These findings suggest that the discretionary accruals of the Jones model, the discretionary of bad debt, the discretionary of non-operating or non-revenue-generating activity, the discretionary of net gain on property sales, and cross-sectional models appear well specified when applied to a random sample of firm-years.

4.3 Power to detect earnings management

This section conveys the artificially induced earnings management simulation results. Table 10 provides information regarding the effectiveness of alternative models used to determine earnings management. The frequency of Type II errors in Table 10 corresponds to the relative power test levels for the discretionary of bad debt, the discretionary of non-operating or non-revenue-generating activity and the discretionary of net gain on property sales in a binomial test and reject the null hypothesis that the observed rejection frequencies equal the specified test levels. These findings suggest that the abnormal bad debt, the abnormal non-operating or non-revenue generating activity expenditure, the abnormal net gain on the sale of property and cross-sectional models appear well relative power when applied to a random sample of firm-years.

Overall, Tables 8 and 9 show that the standard Jones, BD (abnormal bad debt), NORR (abnormal non-operating or non-revenue-generating activity expenditure),, NGSP (abnormal net gain on property sales), and cross-sectional models are well-specified; the BD (abnormal bad debt), NORR (abnormal non-operating or non-revenue-generating activity expenditure), NGSP (abnormal net gain on property sales), and cross-sectional models appear to possess high relative power. Thus, discretionary items (discretionary accruals and discretionary real spending) are evaluated differently regarding specification and power in relation to NFP hospitals in Taiwan.

5. Conclusion

Previous studies have focused on researching earnings management behavior in nonprofit hospitals in the UK and the U.S. however, the operational system and environment of hospitals in Taiwan are significantly different from the cases studied and cannot therefore be considered equivalent. This study used the ordinary least square method and cross-sectional estimation procedures to examine power issues relating to the measurement of abnormal accruals and abnormal real items in Taiwan's nonprofit hospitals. We also developed and tested alternative procedures, labeled the discretionary accruals of the Jones model, the discretionary accruals of the modified Jones model, the discretionary of bad debt, the discretionary of working capital, the discretionary of non-operating or non-revenue-generating, the discretionary of net gain on property sales.

The empirical results show that discretionary accruals of the Jones model, discretionary of bad debt, discretionary of non-operating or non-revenue-generating and discretionary of net gain on property sales cross-sectional models appeared well specified. However, only the discretionary of bad debt, discretionary of non-operating or non-revenue-generating and discretionary of net gain on property sales cross-sectional models appeared well relative power when applied to a random sample of firm-years. Empirical solutions show that the discretionary of bad debt, discretionary of non-operating or non-revenue-generating, and discretionary of net gain on property sales are ideal for evaluating earnings management in Taiwan's nonprofit hospitals.

Non-profit hospitals have different goals, management, and manager enticement. All of which lead to differences in financial reports. Because of the special environment, non-profit hospitals in Taiwan often make complex. Most of non-profit hospitals (especially medical centers or institution-owned Hospitals) have positive net income and even more than other industries were. The Department of Health, Executive Yuan, and Taiwan (DOH) adopts the so-called revenue-increased system. It leads to burden citizen's insurance costs. It is a serious puzzle. Earnings management and the source of revenue for hospitals are possible reasons for this, as well as the possibility of an unbalanced insurance system.

Future studies should consider refining the measurement of the earnings management model because not all of them are equal, and it is unlikely that the consequences of engaging in earnings management are equal in all non profits hospitals. In addition, researchers should examine which magnitude is optimal for earnings management in the discretionary of bad debt, discretionary of non-operating or non-revenue-generating and discretionary of net gain on property sales models. Subsequent research should keep track of these trends and analyze the degree of earnings manipulation. Thus, the research will cover a complete study of earnings management in not for profit hospitals.

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Table 1. Definition of Variables

Variable	Definition
ΔBD_{it}	the change in bad debt expenses for year *t*
$\Delta NETREV_{it}$	the change in net revenue for year *t*
$\Delta MEDCARE_{it}$	the change in Medicare revenue (revenue collected by hospitals through national medical insurance) for year *t*
$\Delta MEDCAID_{it}$	the change in Medicaid revenue for year *t*
$JACC_{it}$	the total accruals calculated as the change in non-cash current assets minus the change in current liabilities for year *t*-1 to year *t* and minus the depreciation expenses for year *t*
$ASSET_{it-1}$	the total assets in year *t*-1
$NPPE_{it}$	the net property, plants, and equipment at the end of year *t*
$MJACC_{it}$	the total accruals calculated as the continuing operating net profit (medical net profit) minus the cash flow from operations for year *t*
$\Delta SALES_{it}$	the change in medical revenue for year *t*
ΔAR_{it}	the change in account receivables for year *t*
$GPPE_{it}$	the gross fixed assets for year *t*;

ΔWC_{it}	the change in working capital accruals = (the change in current non-cash assets minus the change in current liabilities) for year *t*
CFO_{it-1}	the cash flow from operations for year *t*-1
CFO_{it}	the cash flow from operations for year *t*
CFO_{it+1}	the cash flow from operations for year *t*+1
$\Delta EXPEND_{it}$	change in non-operating or non-revenue-generating activity expenditure for *t*-1 to *t*
$DECREASE_{it}$	1 if pre-management[20] income/total assets are within or above the benchmark range (income/total assets[0,0.04]) for year *t*, and 0 otherwise
$INCREASE_{it}$	1 if pre-management[21] income/total assets exceed the benchmark range (income/total assets[0,0.04]) for year *t*, and 0 otherwise
$NOPRED_{it}$	1 if pre-management[22] income/total assets are below the benchmark range (income/total assets[0,0.04]) for year *t*, and 0 otherwise
$LASSET_{it}$	log of the total assets for year *t*
$GAIN_{it}$	1 if the hospitals reports a net gain on the sale of property in year *t*, 0 otherwise
$BELOWZERO_{it}$	1 if pre-managed[23] income/total assets are to the left of the benchmark range (income/total assets < 0.0) for year *t*, 0 otherwise
$ABOVEZERO_{it}$	1 if pre-managed[24] income/total assets are to the left of the benchmark range (income/total assets ≥ 0.04) for year *t*, 0 otherwise
$GPPE_{it-1}$	gross property, plants, and equipment for year *t*-1

[20] We begin by calculating net income before spending on non-operating or non-revenue-generating activity (Eldenburg et al., 2011).

[21] We begin by calculating net income before spending on non-operating or non-revenue-generating activity (Eldenburg et al., 2011).

[22] We begin by calculating net income before spending on non-operating or non-revenue-generating activity (Eldenburg et al. 2011).

[23] We begin by calculating net income before net gain on property sales activity (Eldenburg et al., 2011).

[24] We begin by calculating net income before net gain on property sales activity (Eldenburg et al.2011).

Table 2. Descriptive statistics—all samples

Variables	Definition	Max	Min	Avg
$DABD_{it}$	the discretionary of bad debt	0.93793	-0.1292	0.09173
DAJ_{it}	the discretionary accruals of the Jones model (1991)	0.86116	-0.2441	0.12279
$DAMJ_{it}$	the discretionary accruals of the modified Jones model	0.27624	-11.244	-0.2921
$DAWC_{it}$	the discretionary of working capital	0.66028	-1.2059	0.003
$DANGA_{it}$	the discretionary of non-operating or non-revenue-generating activity	0.06776	-0.0106	0.01188
$DAGSP_{it}$ (ten million)	the discretionary of net gain on property sales	6.703	-12.745	-8.179

Table 3. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary of bad debt

$$\frac{\Delta BADDEBT_{it}}{TA_{it-1}} = \frac{\beta_{0t}}{TA_{it-1}} + \frac{\beta_{1t}\Delta NETREV_{it}}{TA_{it-1}} + \frac{\beta_{2t}\Delta MEDCARE_{it}}{TA_{it-1}} + \frac{\beta_{3t}\Delta MEDCAID_{it}}{TA_{it-1}} + \varepsilon_{it}$$

Year	β_{0t}	β_{1t}	β_{2t}	β_{3t}	R^2	F value
2005	-0.058	0.175*	0.457***	-0.325**	0.427	15.51
2006	-0.156	0.315**	0.477**	-0.448**	0.385	14.41
2007	0.305*	0.417**	-0.205	-0.483***	0.321	15.48
2008	0.258*	0.289**	0.345**	0.153	0.352	15.21
2009	0.215*	0.307***	0.179	-0.248**	0.285	14.41
2010	0.205***	0.341***	-0.225	-0.283**	0.521	14.84
2011	0.458***	-0.125	0.245**	-0.332*	0.279	15.66

Table 4. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary accruals of the Jones model

Year	$\frac{ACC_{it}}{TA_{it-1}} = \frac{\beta_{0t}}{TA_{it-1}} + \frac{\beta_{1t}\Delta NETREV_{it}}{TA_{it-1}} + \frac{\beta_{2t}PPE_{it}}{TA_{it-1}} + \varepsilon_{it}$				
	β_{0t}	β_{1t}	β_{2t}	R^2	F value
2005	-0.061	0.032***	-0.026***	0.242	15.645
2006	0.056	-0.086	-0.126**	0.135	11.064
2007	0.067	0.364***	0.084	0.173	16.688
2008	-0.212**	0.051	-0.230**	0.135	15.16
2009	-0.061**	0.032	-0.026	0.098	15.645
2010	-0.056**	0.086**	-0.126	0.109	11.125
2011	-0.047	0.442***	0.054	0.155	16.147

Table 5. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary accruals of the modified Jones model

Year	$\frac{ACC_{it}}{TA_{it-1}} = \frac{\beta_0}{TA_{it-1}} + \beta_1\frac{\Delta SALES_{it} - \Delta AR_{it}}{TA_{it-1}} + \beta_2\frac{PPE_{it}}{TA_{it-1}} + \varepsilon_{it}$				
	β_{0t}	β_{1t}	β_{2t}	R^2	F value
2005	-0.372***	0.314***	-0.194**	0.313	11.235
2006	-0.233**	0.361***	-0.259**	0.258	12.347
2007	-0.191*	0.285**	-0.211**	0.125	10.256
2008	-0.255**	0.551***	0.144	0.242	12.335
2009	0.237	0.331***	-0.364**	0.231	13.578
2010	-0.342***	0.425***	-0.321**	0.341	14.215
2011	-0.405**	0.375**	-0.245*	0.159	11.243

Table 6. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary of working capital

Year $\frac{\Delta WC_{it}}{TA_{it-1}} = \frac{\beta_0}{TA_{it-1}} + \beta_1 \frac{CFO_{it-1}}{TA_{it-1}} + \beta_2 \frac{CFO_{it}}{TA_{it-1}} + \beta_3 \frac{CFO_{it+1}}{TA_{it-1}} + \beta_4 \frac{\Delta REV_{it}}{TA_{it-1}} + \beta_5 \frac{PPE_{it}}{TA_{it-1}} + \varepsilon_{it}$

	β_{0t}	β_{1t}	β_{2t}	β_3	β_4	β_5	R^2	F
2005	0.668*	-1.161***	-0.865***	-0.097	0.713**	-0.523	0.512	11.25
2006	0.557**	-0.962***	-0.765	0.916	0.581**	0.433	0.412	10.03
2007	0.782**	-0.741**	0.235	-0.095	0.642*	0.758*	0.395	12.46
2008	0.421**	-0.689***	-0.125	0.126	0.359*	-0.658	0.405	13.25
2009	0.325*	-0.558***	0.339	0.436**	0.451**	-0.648	0.458	11.25
2010	0.741***	-0.641**	-0.425	-0.256	0.745***	0.614*	0.558	10.48
2011	0.653**	-0.569**	0.432	0.256*	0.162*	0.558	0.358	11.12

Table 7. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary of non-operating or non-revenue-generating activity

Year $\frac{\Delta EXPEND_{it}}{ASSET_{it}} = \beta_0 + \beta_1 DECREASE_{it} + \beta_2 INCREASE_{it} + \beta_3 NOPRED_{it} + \beta_4 ASSET_{it} + \beta_5 \frac{\Delta SALES_{it}}{ASSET_{it}} + \varepsilon_{it}$

	β_{0t}	β_{1t}	β_{2t}	β_3	β_4	β_5	R^2	F
2005	0.068**	0.083	0.024	-0.067	0.092**	-0.019	0.266	10.1
2006	-0.056	-0.075**	0.125***	0.069**	0.059*	0.036	0.285	10.5
2007	-0.024	-0.156*	0.085*	-0.058	0.125**	0.154**	0.275	11.2
2008	-0.078	0.099	0.256***	0.139**	-0.025	0.339***	0.295	12.3
2009	0.069	-0.275**	0.342***	0.354***	-0.056	0.114*	0.352	13.5
2010	-0.055	-0.062*	0.156**	0.342***	-0.072	0.245***	0.328	11.5
2011	0.048	-0.352***	-0.056	0.415***	0.125*	0.128**	0.365	10.2

Table 8. Descriptive Statistics for the estimated cross section for each hospital and year combination: the discretionary of net gain on property sales

Year $GAIN_{it} = \beta_0 + \beta_1 BELOWZERO_{it} + \beta_2 ABOVEZERO_{it} + \beta_3 ASSET_{it} + \beta_4 \Delta SALES_{it} + \beta_5 PPE_{it-1} + \varepsilon_{it}$

	β_{0t}	β_{1t}	β_{2t}	β_3	β_4	β_5	R^2	F
2005	0.659***	0.054*	-0.039	0.0115	0.085**	0.006	0.321	12.5
2006	0.528***	0.412***	0.504****	0.525***	0.426***	0.312***	0.558	12.3
2007	0.652***	0.185**	0.142*	-0.051	0.235**	0.215**	0.514	11.5
2008	0.248**	0.254***	0.236**	-0.014	-0.129	0.159	0.375	10.2
2009	0.445***	0.441**	0.412**	0.262	0.321*	-0.115	0.435	11.2
2010	0.512***	-0.109	0.352**	0.325**	0.243*	-0.058	0.421	10.9
2011	0.345**	0.524***	0.125	0.434**	0.159*	0.123	0.455	11.3

Table 9. Comparison of Type I error rates for abnormal accruals estimated using the discretionary accruals of the Jones model, the discretionary accruals of the modified Jones model, the discretionary of bad debt, the discretionary of working capital, the discretionary of non-operating or non-revenue-generating activity, the discretionary of net gain on property sales. Percentage of 700 Randomly Selected Firm-Years for which the Null Hypothesis of No Earnings Management is Rejected Using a One-Tailed Test

Alternative Hypothesis	Income increasing accruals		Income decreasing accruals	
Null Hypothesis	Earnings Management ≥ 0		Earnings Management ≤ 0	
Test Level	5%	1%	5%	1%
the discretionary accruals of the Jones model	6.25%	1.25%	5.17%	1.36%
the discretionary accruals of the modified Jones model	4.52%	0.52%	4.22%	0.78%
the discretionary of bad debt	5.25%	1.98%	5.17%	1.59%
the discretionary of working capital	4.17%	0.59%	4.45%	0.88%
the discretionary of non-operating or non-revenue-generating activity	5.55%	1.25%	5.21%	1.18%
the discretionary of net gain on property sales	5.71%	1.43%	5.43%	1.63%

Simulations for each abnormal accrual model are performed using 100 random samples of 25 firms in each of the seven sample years (2005-2011), resulting in a total of 700 simulations per model.

* Significantly different from the specified test level at the 5 percent level

** Significantly different from the specified test level at the 1 percent level using a two-tailed binomial test.

Table 10. Comparison of Type II error rates for abnormal accruals estimated using the discretionary accruals of the Jones model, the discretionary accruals of the modified Jones model, the discretionary of bad debt, the discretionary of working capital, the discretionary of non-operating or non-revenue-generating activity, the discretionary of net gain on property sales. Percentage of 700 Randomly Selected. Firm-Years for which the Null Hypothesis of No Earnings Management is Rejected Using a One-Tailed Test

Alternative Hypothesis	Income increasing accruals		Income decreasing accruals	
Null Hypothesis	Earnings Management ≥ 0		Earnings Management ≤ 0	
Test Level	5%	1%	5%	1%
the discretionary accruals of the Jones model	5.15%	1.26%	5.28%	1.58%
the discretionary accruals of the modified Jones model	5.26%	1.37%	5.59%	1.76%
the discretionary of bad debt	4.18%	0.58%	4.15%	0.85%
the discretionary of working capital	5.17%	1.35%	5.33%	1.85%
the discretionary of non-operating or non-revenue-generating activity	4.27%	0.62%	4.25%	0.77%
the discretionary of net gain on property sales	4.39%	0.75%	4.05%	0.68%

Simulations for each abnormal accrual model are performed using 100 random samples of 25 firms in each of the seven sample years (2005-2011), resulting in a total of 700 simulations per model.

* Significantly different from the specified test level at the 5 percent level.

** Significantly different from the specified test level at the 1 percent level