

# AUDIT COMMITTEE EFFECTIVENESS IN THE LARGEST US PUBLIC HOSPITALS: AN EMPIRICAL STUDY

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## ABSTRACT

*Most research focuses on the role of audit committees in the private sector and less in the public sector, especially public hospitals. Therefore, we investigate the role and quality of public hospital audit committees in controlling problems in financial reporting and in major Federal award programs. We investigate all publicly available Office of Management and Budget Circular A-133 audit reports on internal controls over Federal reporting for public hospitals. We then conduct a follow-up study on the administrators of these reporting units. We find the presence of a committee and the committee's specific quality characteristics of independence, financial expertise, and increased activity, positively correlate with reduced frequencies of internal control problems. In addition, we find audit committees with financial expertise associated less frequently with material weaknesses over financial reporting and over major Federal programs. Our findings extend corporate governance research to the public health care sector, provide additional support for the Sarbanes-Oxley Act of 2002 and the Office of Management and Budget Circular A-123 requirements, and answer questions found in prior research on non-profit hospitals given by Vermeer et al. (2006) and Pridgen & Wang (2007).*

**JEL:** M4, H5, H7

**KEYWORDS:** Audit committee; internal control; Office of Management and Budget Circular A-133 audit; material weakness.

## INTRODUCTION

Audit Committees (ACs) serve an important monitoring mechanism in corporate governance. In the aftermath of highly publicized corporate scandals, such as Enron, WorldCom, and Tyco, the Sarbanes-Oxley Act of 2002 increased the committee's responsibility in providing greater transparency and an internal control structure over financial reporting in private sector. In like manner, the public sector also increased the committee's responsibilities. The U.S. Government Accountability Office (GAO) recommends that public sector entities consider the benefit of using ACs in governmental units (George, 2005; Hardiman, 2006).

Because of the investigations of ACs operating in the private sector and the correspondingly few studies about the role and effectiveness of ACs in the public sector, especially in public health care, (e.g., DeZoort et al., 2002; Hermalin & Weisbach, 2003; Vermeer et al., 2006), we extend the prior corporate governance research to the public health care sector. We do this by examining the impact of ACs in Federally funded public hospitals and healthcare systems (hereafter public hospitals).

Every year, more than 10 million people in the United States (U.S.) receive health care from public hospitals. More than 80% of public hospitals provide many essential community-wide services, such as primary, trauma, and neonatal intensive care to uninsured patients (Zaman et al., 2004). The indigent and uninsured population is growing, with more than 47 million uninsured Americans and illegal aliens (Gilmer & Kronick, 2005; Adamy & Meckler, 2010). To address this gap in healthcare coverage, U.S.

public hospitals have become “safety net” institutions (Baxter & Mechanic, 1997; Fishman & Bentley, 1997). The stated mission of public (safety net) hospitals is to “always be there when other institutions cannot, are not, or do not want to be there” (Stolzenberg, 2000, p.347). Since public hospitals have a special commitment to provide health care to the uninsured (Bazzoli et al., 2003; NAPH, 2009) and low-income populations (NAPH, 2009; Zaman et al., 2004), they play a significant and critical role in our community. Public hospitals are extensions of state and local governments thus, are exempt from the State and Federal corporate income tax. Public hospitals are charitable in nature. However, they generally do not fit the definition of Section 501 (c) (3) of the Internal Revenue Code for a charitable organization. While public hospitals receive direct tax support, most operate independent of the local government. In this position, they must maintain a separate budget and cannot expect continuous bailouts for fiscal incompetence (Armario, 2010).

The Sarbanes-Oxley Act of 2002 (SOX) (U.S. House of Representatives, 2002; hereafter SOX) mandated important changes in the structure and operation of ACs to improve corporate governance in public corporations (private sector). Governance is not only important in private sector but also in public sector. While many provisions of SOX do not apply to the public sector, SOX has spurred the public to consider the value and role of ACs to promote and improve sound governance in public sector (Deloitte & Touche, 2005; Gorge, 2005; Hardiman, 2006). Additionally, respected organizations have advocated for more widespread and effective use of ACs in the public sector. For example, the Government Finance Officers Association (GFOA) (2002) and the Office of Management Budget (OMB) encourage and recommend the establishment of an AC or its equivalent (Deloitte & Touche, 2005). Likewise, the Institute of Internal Auditors (n.d.) encourages all public sector entities to establish an effective AC to demonstrate greater accountability.

Prior research related to corporate ACs focuses primarily on large publicly traded companies, which documents that AC characteristics are associated with improved governance and financial reporting quality (e.g., Krishnan, 2005; McMullen, 1996; Owens-Jackson et al., 2009). Empirical evidence about whether ACs of public hospitals improve governance and accountability is scarce. Although this is found, in part, for non-profit hospitals recently by Vermeer et al., (2006) and Pridgen & Wang (2007).

The purpose of this study is to investigate whether ACs (presence and characteristics) in public hospitals impact organizational accountability, measured by reported internal control problems in A-133 reports. Our sample consists of all publicly available A-133 audit reports on internal controls over Federal reporting and a follow-up study conducted on the administrators of all of their 75 public hospitals operating in the U.S. We examine the relationship between the presence and the characteristics of public hospital ACs and the quality of internal control over financial reporting and major Federal award programs.

We find a significant relationship between the presence of ACs and internal control quality. We also find that independence, financial expertise, and activity level (meeting frequency), exhibit a significant negative association with the incidence of internal control problems. Our findings are consistent with prior research in public companies, suggesting that AC quality characteristics have a positive impact on financial reporting (e.g., Abbott et al., 2004; Carcello & Neal, 2000; Krishnan, 2005; Owens-Jackson et al., 2009). In addition, our results provide insights into the monitoring function of public hospital ACs. Thus, when funding is at risk due to insufficient controls, as required by Federal grants, hospitals respond by increasing the monitoring function of ACs.

The next section introduces the background and hypotheses. Section 3 describes research method. Section 4 follows with data collection. Section 5 presents empirical results. The final section contains conclusion, limitations, and future studies.

## BACKGROUND AND HYPOTHESES

### Prior Literature on Audit Committees

The effects of the enactment of SOX, failures in the quality of government audits (George, 2005), and recent public sector scandals, such as \$2 million spending scandal in the Roslyn school district (Strugatch, 2004) and Jackson Health System' gross mismanagement (Dorschner, 2010), have contributed to the call for improved governance in the governmental entities. In response to this call, the GFOA and AICPA published guidance for the structure, responsibilities, activities and operations of ACs at different levels of governmental entities (David, 2009).

Many empirical study focusing on public companies provide evidence suggesting that firms with an AC (e.g., DeChow et al. 1996; Defond and Jiambalvo 1991; McMullen 1996) and AC characteristics (e.g., Abbott et al., 2004; Lee et al., 2004; Uzun et al., 2004; Krishnan, 2005; Owens-Jackson et al., 2009) are more likely to have higher quality of financial reporting. In general, these studies indicate a positive association between the presence and characteristics (size, independence, financial expertise, and or meeting frequency) of an AC and the quality of financial reporting. Defond and Francis (2005) suggest that more AC research needs to be done after the enactment of SOX. They also call for future research to build on the existing AC studies to develop a better and deeper institutional understanding of auditing issues.

The research conducted in heath care generally focuses on nonprofit hospitals. For example, Wagner et al. (1988) use surveys to report the role of ACs in three service industries, municipal government, hospitals, and banks. They find that the AC of nonprofit hospitals the monitor internal auditor, engage the independent auditor, and evaluate audit results. In addition, Wagner et al. (1989) reported survey results of the extent to which non-profit hospitals used ACs, the composition and responsibilities of such committees, and the perception of the effectiveness of these committees. Based on their survey, 54 percent of the hospitals had either an AC or similar control committee. A majority of hospital ACs were composed of three to five members. Most hospital ACs had a majority of outside directors and were chaired by an outsider.

Urbancic and Hauser (1991) argue that the organizational governance of a hospital improves with an effective functioning AC. They conduct a study to analyze the structure, responsibilities, and activities of hospital ACs. The sample size is 141 hospitals including 20 government-sponsored hospitals. Similar to Wagner et al. (1989), they found 54 percent of hospitals in their survey with an AC. In addition, the average member size on ACs is 6.6, most members serving on the AC were outside directors, 47 percent of the ACs had an accountant serving as a member, and most of ACs meets two to four times a year.

Because of the recent changes in governance, we would expect that the use of ACs have increased. A more recent study, Vermeer et al. (2006) examine the composition of nonprofit ACs and the factors associate with their composition. These nonprofit organizations include hospitals and university/colleges. They find that 75 percent of the sample entities have an AC. Of this sample, ACs in hospitals/universities are more likely to have at least one financial expert on the AC, but those ACs in hospital/universities are less likely to have entirely independent directors on ACs. Pridgen and Wang (2007) examine whether the use of ACs by nonprofit hospitals improves organizational accountability. Using a sample of nonprofit hospitals selected from the years 2001 to 2004, they only find in one year (2002) where reported internal control weakness in administering Federal program are significantly less with the use of an AC. They do not find such a relationship in other three years. Furthermore, they find no relationship between the use of an AC and reported internal control weaknesses associated with financial statement audits.

While these studies by Wagner et al. (1988, 1989), Urbancic and Hauser (1991), and Vermeer et al. (2006) extend AC research to the nonprofit area, most of these studies did not include government or public health care sector hospitals. In addition, they did not test the monitoring effect of these ACs in their organizations. The later study, Pridgen and Wang (2007), examines the monitoring effect of ACs in nonprofit hospitals. This study, however, found mixed results. Furthermore, Vermeer et al. (2006) argue nonprofit organizations that receive government grants are more likely to have ACs due to the increased demand for effective monitoring. Since public hospitals are extensions of government entities and dependent upon direct government financial support, these facilities demand more effective monitoring to fulfill reporting and internal control requirements. Therefore, these arguments by Vermeer et al. (2006) provide support for the value of our sample selection.

#### OMB Circular A-133 Audit (Single Audit)

ACs oversee the results of A-133 audits. OMB (2003) Circular A-133, *Audits of States, Local Governments, and Nonprofit Organizations*, applies to major Federal programs administered by the grant recipient. OMB Circular A-133 requires that all public hospital institutions that receive Federal grants in excess of \$500,000 complete the A-133 audit at least nine months after the close of the fiscal year. Auditors of these public hospitals are required to report on the fairness of the financial statements and report on the internal control related to the financial reporting and major Federal programs; compliance with laws, regulations, provisions of contracts or grant agreements applicable to Federal program; and whether the schedule of expenditures of major Federal awards programs is presented fairly.

Prior literature concerning hospital institutions that receive federal funds under the OMB Circular A-133 audit requirements is limited. The study discussed earlier by Pridgen and Wang (2007), using a sample subject to the requirements of OMB Circular A-133, examines whether the use of an AC reduces the likelihood of reported internal control weakness. However, they did not examine whether AC characteristics (such as size, independence, financial expert, and/or meeting frequency) improve organizational governance and accountability, which is the focus of private sector empirical research studies (e.g., Abbott et al., 2004; Agrawal & Chadha, 2005; Bedard et al., 2004; Krishnan, 2005).

#### Internal Control Weaknesses

As a condition for participation in Federal grant programs, public hospitals must have adequate and sufficient internal controls to ensure that the hospital complies with all applicable Federal and state laws and regulations. In addition, the hospital must have internal controls in place so that they properly administer the Federal programs. If internal controls are not sufficient, a hospital risks losing the Federal grant funding.

The reporting requirements over internal control for the A-133 audit are similar to reporting requirements of SOX at publicly traded companies. As part of the A-133 audit, the external auditor identifies any reportable conditions or material weaknesses over financial reporting and major federally sponsored programs.

A reportable condition over financial reporting occurs when a misstatement could arise (or has arisen) in the financial statements or the schedule of Federal award expenditures, in all material respects, in relation to the financial statements taken as a whole (OMB, 2003, Section 500). Table 1 outlines the A-133 audit reporting guidelines.

A reportable condition over major Federal award programs occurs when the external auditor does not obtain reasonable assurance that internal controls are in place and are operating effectively and that the major Federal programs comply with 14 program and financial requirements (OMB, 2004). Table 2

outlines the reporting requirements of the OMB over reportable conditions and non-compliance for A-133 reports. Typically, these may include funding current operations with noncurrent funds, improper billing and collection procedures, and lack of proper documentation for billing, receiving and controlling for supplies, services, other resources and more.

Table 1: A-133 Audit Reporting Guidelines

| Audit Results  | OMB Citation                        |
|--|-------------------------------------|
| The type of report the auditor issued on the financial statements (e.g., unqualified opinion, qualified opinion, adverse opinion, or disclaimer of opinion).                                   | OMB 2003, Section 505 (d) (1) (i)   |
| Where applicable, a statement that reportable conditions in internal control were disclosed by the audit of the financial statements and whether any such conditions were material weaknesses. | OMB 2003, Section 505 (d) (1) (ii)  |
| A statement as to whether the audit disclosed any noncompliance which is material to the financial statements.   | OMB 2003, Section 505 (d) (1) (iii) |
| Where applicable, a statement that reportable conditions in internal control over major programs were disclosed by the audit and whether any such conditions were material weaknesses.         | OMB 2003, Section 505 (d) (1) (iv)  |
| The type of report the auditor issued on compliance for major programs (i.e., unqualified opinion, qualified opinion, adverse opinion, or disclaimer of opinion).                              | OMB 2003, Section 505 (d) (1) (v)   |
| A statement as to whether the audit disclosed any audit findings, which the auditor is required to report under the requirements listed in Table 2.  | OMB 2003, Section 505 (d) (1) (vi)  |
| A statement as to whether the auditee qualified as a low-risk auditee.   | OMB 2003, Section 505 (d) (1) (ix)  |

*This table 1 shows a brief summary of the auditor's results that shall be included in the audit reports.*

Table 2: OMB Reporting Requirements over Reportable Conditions and Non-compliance

| Reporting Requirement   | OMB Citation                  |
|---|-------------------------------|
| Reportable conditions in internal control over major programs.  | OMB 2003, Section 510 (a) (1) |
| Material non-compliance with the provision of laws, regulations, contracts, or grant agreements related to a major program. | OMB 2003, Section 510 (a) (2) |
| Known questionable costs, which are greater than \$10,000 for a type of compliance requirements for a major program.        | OMB 2003, Section 510 (a) (3) |
| Know questionable costs, which are greater than \$10,000 for a Federal program and is not audited as a major program.       | OMB 2003, Section 510 (a) (4) |
| Known fraud affecting a Federal award.  | OMB 2003, Section 510 (a) (6) |

*This table 2 shows a brief summary of the audit finding that the auditor shall report in the audit reports*

### Development of Hypotheses

Prior studies about corporate ACs typically use agency theory to develop and test hypotheses (e.g. Carcello & Neal, 2000, 2003; Klein, 2002). Because public hospitals have no shareholders or owners, the concept of agency is less applicable. A theory with much more relevance to public sector hospitals is resource dependency, which provides a relevant framework for examining a diverse set of issues related to nonprofit and governmental organizations and their boards (e.g., Anheier, 1997; Brown, 2005; Hillman & Dalziel, 2003; Miller-Millesen, 2003; Pridgen & Wang, 2007; Vermeer et al., 2006, 2009). This theory provided by Pfeffer and Salancik (1978) posits that an organization's need for resources is a determinant of its structure and activities. Public hospital board (and therefore AC) members are more likely to be selected according to resource dependency theory (Pfeffer, 1973; Pfeffer & Salancik, 1978; Vermeer et

al., 2006, 2009), and hence are typically chosen for their support of management or because of their access to or control of funding sources. According to the latter, the funding sources tend to monitor the outcomes of funding, such as in the government audits of public hospitals. Therefore, in these cases, the AC members would act to prevent the misstatements of management, as would agency theory-based AC members who would monitor management in the interests of the corporate stockholders (Jensen & Meckling, 1976; Fama & Jensen, 1983).

Vermeer et al. (2006) find nonprofit organizations that receive government funds are more likely to have effective monitoring by ACs. The receipt of government funds, specially these that are subject to OMB Circular A-133 audit, brings with it many additional reporting and internal control requirements, and in turn leads to an increased demand for creating an AC to perform monitoring functions. This demand suggests that having an AC in organizations subject to OMB Circular A-133 audit improves the internal controls over major Federal awards. Moreover, Vermeer et al. (2006) argue that nonprofit hospitals and universities with government-sponsored grants are more likely to have effective monitoring by ACs. Since public hospitals have much higher levels of complexity in their operations and are subject to extensive and complex regulations and rules related to the Medicare, Medicaid, and other funding sources, the demand is higher for a strong internal control structure. Thus, public hospitals have an increased need for the monitoring functions of ACs.

Based on the discussion above, ACs are generally more effective in hospitals with Federal grants and required government audits (Vermeer et al., 2006), consistent with resource dependence theory. Therefore, we would anticipate H1 for public hospitals:

*Hypothesis 1: The presence of an AC in public hospital is positively associated with the quality of the internal controls reported in government audits.*

Prior research on corporations finds the AC characteristics of size, of meeting frequency, of independence, whether the members are independent of management, and of financial expertise, whether the committee has a financial expert, to serve as proxies for AC quality. (For examples, see Abbott et al., 2003, 2004; Bedard et al., 2004; Carcello & Neal, 2000, 2003; Chen et al., 2005; Felo et al., 2003; Klein, 2002; Krishnan, 2005; McMullen Raghunandan, 1996; Xie et al., 2003; Zhang et al., 2007).

For publicly traded corporations, Krishnan (2005) and Zhang et al. (2007) find the association between this AC quality and internal control problems. Krishnan (2005) compares 128 public corporations who changed auditors and had reported internal control (8-K) deficiencies from 1994-2000 with those firms who did not change auditors and had no internal control deficiencies. She finds those committees with self-reported independence and financial expertise questions also to have financial control problems, i.e., AC quality to be associated with internal control quality. Similarly, Zhang et al. (2007) compare a sample of firms with internal control weaknesses and match these firms to a sample of control firms without internal control weaknesses. They find increases internal control weaknesses when the firm's audit committee has less financial expertise.

By increasing audit committee's quality characteristics, corporations also obtain a significantly lower cost of debt financing (Anderson et al., 2004). Other studies in public corporations find at least one improved committee quality (size, independence, and financial expertise) related to improved quality financial reporting outcomes (Carcello & Neal, 2000; Klein, 2002; Felo et al., 2003; Xie et al., 2003; Abbott et al., 2004; Bedard et al., 2004; Agrawal & Chadha, 2005; Raghunandan and Rama, 2007). Even though very few studies test the monitoring effect of these ACs in public hospitals, we anticipate AC quality characteristics to have a similar impact for public hospitals, H2:

*Hypothesis 2: A public hospital's AC quality is positively associated with the quality of internal controls reported in government audits.*

## METHODOLOGY

We investigate these two hypotheses following the design of Krishnan (2005) and recommendations of Vermeer et al. (2006). We first define the conceptual variables and then provide their corresponding constructs. Due to data limitations and the nature of our population, we did not test for all variables investigated by Krishnan (2005). However, we added a variable (*HOSPAGE*) to our study not tested by Krishnan (2005).

We estimate the following logistic regression equation to identify the determinants of *ICPROB*:

$$\begin{aligned}
 \text{ICPROB} &= \alpha + \beta_1 \text{SIZE} + \beta_2 \text{INDEP} + \beta_3 \text{EXPERT} + \beta_4 \text{MEET} + \beta_5 \text{FDISTRESS} + \\
 &\beta_6 \text{CFOEXP} \\
 &+ \beta_7 \text{BIG4} + \beta_8 \text{TENURE} + \beta_9 \text{LAUDIT} + \beta_{10} \text{LASSET} + \beta_{11} \text{HOSPAGE} + \varepsilon
 \end{aligned}$$

### The Dependent Variable and Its Construct

We define the dependent variable as the presence of a reported control problem (“a significant control deficiency”) as identified in the A-133 report. Its construct, internal control problem, *ICPROB*, we code either 1 or 0 according to the reported presence or absence of this deficiency.

The A-133 categorizes identified internal control problems as either material weaknesses or reportable conditions. The AICPA standards contained in Government Auditing Standards (GAS) define these terms (U.S. Government Accountability Office [GAO], 2003). On July 27, 2007, the Comptroller General of the U.S. issued the July 2007 revision of GAS to supersede the 2003 revision and to update the definitions and terminology for internal control deficiencies to be consistent with the Public Company Accounting Oversight Board (PCAOB) and AICPA terminology (GAO, 2007). While the U.S. GAO updated the standards, the 2005 A-133 reports we used to define internal control in this study follow the 2003 revision of GAS.

### The Independent Variables

#### *The AC*

We define the independent variables similarly to Krishnan (2005). The first is the presence or absence of an audit committee (*AC*) responsible for the internal controls. We code *AC* 1, if a public hospital has an *AC*, and 0 otherwise.

The next variable is the quality characteristics of the *AC*. While the Securities and Exchange Commission (SEC) has no regulatory authority over public hospitals, their requirements provide a benchmark for examining the quality of *ACs* of public hospitals. The SEC (1999) benchmark requires *ACs* to have (1) at least three members, (2) all members are independent of management, and (3) at least one member with financial expertise.

The *Blue Ribbon Committee Report* (1999) implies that *ACs* should meet at least quarterly. Similarly, the National Association of Corporate Directors (1999) indicates this minimum recommendation. Therefore, in addition to the three SEC requirements, we add a fourth measure of *AC* quality, meeting frequency. Those *ACs* that meet five or more times a year, exceed the minimum of four, and therefore this frequency defines a measure of quality.

Consequently, we use four parameters, size (*SIZE*), independence (*INDEP*), financial expertise (*EXPERT*), and meeting frequency (*MEET*) to proxy for AC quality. We code *SIZE* 1 if the AC consists of at least three members, and 0 otherwise. *INDEP* is coded 1 if the AC consists entirely of (non-management) independent members, and 0 otherwise. We code *EXPERT* 1 if the AC includes at least one member with financial expertise as defined by the AICPA Audit Committee Toolkit (and illustrated by Morrow & Pastor, 2007), and 0 otherwise. *MEET* is coded 1 if the AC met more than four times during the 2005 fiscal year, and 0 otherwise.

### Other Monitors

Three monitors – management qualifications, the external auditors, and internal audit function – interact with ACs to contribute to the control environment (COSO, 1992). These monitors form the basis of the control environment and affect the entity’s internal controls (Krishnan, 2005).

*Management Qualifications:* Similar to Krishnan (2005), we use as a proxy for management qualifications (*CFOEXP*) the presence of a CPA certification, or similar financial experience of the Chief Financial Officer (CFO) or Controller.

*The External Auditor:* The external auditor characteristics include auditor type (*BIG4*) and auditor tenure (*TENURE*). We include external auditor control variables since they may have an independent effect on the internal control quality (Krishnan, 2005). Section 404 of SOX requires that every registrant to contain an assessment by management of the design and operating effectiveness of its internal control over financial reporting in its financial statements and independent auditor to attest to the management’s assessment of the company’s internal control over financial reporting (SEC, 2003). In addition, these variables serve to control for differences in auditors’ discovery, determination, and reporting of control problems (Krishnan, 2005).

It is generally assumed that “brand name” (Big Four International) auditors enhance audit quality. Prior studies on the use of Big Four auditors focus mostly on public corporations. The Big Four auditors generally have more audit expertise and experiences, and greater resources to identify control issues than non- Big Four auditors do (Ge & McVay, 2005; Doyle et al., 2007; Francis & Yu, 2009). Brand-name auditors generally have higher quality of financial reporting (Becker et al., 1998; Francis et al., 1999; Reynolds & Francis, 2000; Francis & Yu, 2009). Becker et al. (1998) and Reynolds and Francis (2000) argue that Big Six auditors are able to detect earnings management and act to curb opportunistic earnings management. Becker et al. (1998), Francis et al. (1999), and Reynolds and Francis (2000) provide evidence that clients with the use of Big Six auditors have lower discretionary accruals than clients with the use of non- Big Six auditors. Francis and Yu (2009) find that clients audited by larger offices of Big Four auditors are also less likely to have aggressively managed earnings. Moreover, Krishnan (2005) finds that companies with internal control problems are more likely to have Big Five auditors than companies with no internal control problems. Ge and McVay (2005) find that companies with larger audit firms are more likely to disclose a material weakness in internal control, after controlling for business complexity, firm size, and firm profitability.

Auditor tenure (*TENURE*) is the second proxy for external auditor quality. Research finds a negative association between auditor tenure and the measures of control quality, such as discretionary accruals (Frankel et al., 2002; Johnson et al., 2002; Myers et al., 2003), the likelihood of failures in auditor reporting (Geiger & Raghunandan, 2002), and the incidence of internal control problems (Krishnan, 2005). However, in public hospitals where the auditor would provide the lower audit fee financial audit and the Federal programs audit, tenure is less likely used into obtain additional consulting and to treat the audit fee as annuity or to breed familiarity so as to reduce professional skepticism. Here, auditor tenure



may actually increase the auditor's ability to find reportable conditions and may be required as some programs are not audited each year.

*Internal Audit Function:* The internal audit department (*IAUDIT*) is a primary resource available to the AC to assist in their responsibility over corporate governance (Gramling et al., 2004). The internal audit department's role is to identify and monitor internal controls uses, and hence may help to reduce the control problems. Iyer and Watkins (2008) find that nonprofit organizations engaging external or internal auditors are more likely to have a code of conduct and have periodic assessments of internal controls.

### Other Variables

We identify three additional variables – the size, age, and financial distress of the hospital – that have a potential impact on internal control quality.

*Hospital Size:* We measure public hospital size as the logarithm of total assets (*LASSET*), as used in Krishnan (2005). In the business sector, large firms generally have higher quality internal controls (e.g., Defond & Jiambalvo, 1991). Large firms likely have more financial reporting processes and control procedures in place (Ge & McVay, 2005). These firms generally have higher quality employees and resources as well as the ability to invest in internal control systems. The findings on the association of firm size and the quality of internal control yielded mixed results. Krishnan (2005) finds that firm size is positively associated with the incidence of internal control problems. However, Doyle et al. (2007) and Ge and McVay (2005) find that firm size is negatively associated with the disclosure of material weaknesses in internal control.

*Hospital Age:* The hospital's age (*HOSPAGE*) is another control variable that may be associated with the quality of internal control. Younger firms likely have less established processes and procedures of internal control, and might have employees with less experience compared to older, more established firms (Ge & McVay, 2005). Empirical studies by Doyle et al. (2007) find that younger firms (measured by the number of years the firm has price information on Center for Research in Security Prices) are more likely to disclosure material weaknesses in internal control.

*Financial Distress:* Establishing and maintaining proper internal controls require financial resources. Financial distress hospitals may not be able to invest adequately time and/or money in maintenance of proper controls. In a sample from public corporations, Doyle et al. (2007) and Ge and McVay (2005) find that financially weaker firms are less likely to properly fund proper internal controls. Similarity, Krishnan (2005) also finds that financial distress associated with the increased likelihood of internal control problems.

We used the modified Altman Z-Score model to proxy the probability of bankruptcy or financial distress (*FDISTRESS*). Altman originally developed the "Z-Score" 40 years ago (Altman, 1968). Altman and others have modified the original model to non-manufacturing industries (Altman, 1973; Altman et al., 1995). For example, Kroeze (2005) use the modified model to predict airline corporate bankruptcies. Several researchers applied the model to predict financial distress in a health care setting. Almwajeh (2004) and Langabeer (2006) find that the revised model is a good predictor of financial distress in a hospital setting. Technically, a score less than 2.6 would indicate that the hospital has a very likely probability of bankruptcy or financial distress. We code *FDISTRESS* 1 if the Altman Z-Score is less than 2.6, and 0 otherwise.

## Data

While there are over 1,100 public, non-federal acute care hospitals in the United States, most are relatively small (Regenstein & Huang, 2005). Eighty-five percent have fewer than 200 beds (Regenstein & Huang, 2005). Based upon our initial investigation these smaller hospitals generally do not receive sufficient Federal awards to require an A-133 audit. Therefore, we limited our investigation to hospital and hospital systems with bed sizes over 200 and operated by state, county, city, or hospital district or authority from the U.S. News/American Hospital Association National Directory provided by American Hospital Association (AHA). The AHA is an association of health care provider organizations and is a national database that includes data on almost 5,000 public and private hospitals, health care systems, networks and other providers of care. This yielded a population of 154 reporting hospitals.

We also contacted each of the 154 by either email or telephone using a standardized questionnaire (a two-page form) to obtain and to verify as best as possible the financial and nonfinancial information. Each of these 154 responded with information on how to obtain their copies of their 2005 fiscal year audited financial statements and A-133 reports, if they were available, and information on their ACs.

Seventy-six hospitals did not have an A-133 audit because they did not expend \$500,000 or more in federal grants during 2005 and three more hospitals did not complete the year 2005 A-133 audit as of January 31, 2007. These three have missed the reporting deadline for 2005 reports (OMB, 2003), and these three confirmed this by the questionnaire. By removing these 79, we find 75 public hospitals that meet the A-133 audit requirement for 2005 fiscal year. We sent the questionnaire to the hospitals via email, fax, and/or USPS mail. Since every state in the U.S. has a law requiring that public records be open and available for inspection and copying by any member of the public (e.g., Georgia Open Records Act; Section 610.011 of Missouri Sunshine Law; The 2006 Florida Statutes), the response rate was 100 percent.

We use the published audited financial statements with A-133 reports to assess our measures of financial distress, auditor type, and hospital size. We also collected additional documentation from each of the 75 hospitals to construct the AC variables, the qualification of management variable, the auditor tenure variable, the internal audit function variable, and the age of hospital variable. We classify an AC member as either an independent member or non-independent/affiliated member as in prior research (Beasley, 1996; Carcello & Neal, 2000, 2003; Klein, 2002; Krishnan, 2005). Independent members are not employees or officers. We consider employees of banks, accounting firms, law firms, and others in public corporations as independent members for our study. In addition, we consider public (or appointed) officials as independent members since they are not paid.

Because the definition of “financial expertise” varies, we asked the respondent the same two different questions used by Vermeer et al. (2006) to determine the presence of financial experts on the AC. The first question asks for the “number of [audit or similar function committee] members who are CPAs.” The second question asks for the “number of [audit or similar function committee] members (other than CPAs) who have senior-level accounting or finance experience.”

## **EMPIRICAL RESULTS**

### Descriptive Statistics

As seen in Panel A of Table 3, 62 of the 75 public hospitals (83 percent) have an AC or have a committee similar to an AC. In addition, Panel A of Table 3 reports the means (in some cases, percentages) and standard deviations for those hospitals with ACs (AC sample) and those without ACs (NOAC sample). Hospitals with no ACs (NOAC) have more internal control problems (*ICPROB*,  $p$ -value = 0.048 < 0.05),

higher probability of bankruptcy or financial distress (*FDISTRESS*,  $p\text{-value} = 0.059 < 0.10$ ), are less likely to have an internal audit function (*IAUDIT*,  $p\text{-value} = 0.004 < 0.01$ ) and a Big 4 auditor (*BIG4*,  $p\text{-value} = 0.004 < 0.01$ ), and are smaller in size (*LASSET*,  $p\text{-value} = 0.04 < 0.05$ ). These tests adjust for the differences in sample sizes (62 versus 13).

Table 3: Sample Statistics for All (75) Hospitals and for 62 Hospitals with Audit (or Similar) Committees

| Panel A: Descriptive Statistics for All Hospitals |           |           |             |           |                  |                 |          |
|---|-----------|-----------|-------------|-----------|------------------|-----------------|----------|
| Variable  | AC Sample |           | NOAC Sample |           | Diff. in + Means | t-statistics ++ | p-value  |
|   | Mean      | Std. Dev. | Mean        | Std. Dev. |                  |                 |          |
| <i>ICPROB</i>                                     | 0.290     | 0.458     | 0.615       | 0.506     | -0.325           | 2.14            | 0.048**  |
| <i>FDISTRESS</i>                                  | 0.309     | 0.465     | 0.615       | 0.506     | -0.306           | 2.03            | 0.059*   |
| <i>CFOEXP</i>                                     | 0.903     | 0.298     | 0.692       | 0.480     | 0.211            | -1.52           | 0.150    |
| <i>BIG4</i>                                       | 0.678     | 0.471     | 0.231       | 0.439     | 0.447            | -3.29           | 0.004*** |
| <i>TENURE</i>                                     | 7.339     | 7.045     | 6.769       | 8.776     | 0.570            | -0.22           | 0.829    |
| <i>IAUDIT</i>                                     | 0.677     | 0.471     | 0.231       | 0.439     | 0.446            | -3.29           | 0.004*** |
| <i>LASSET</i>                                     | 6.212     | 0.903     | 5.391       | 1.248     | 0.821            | -2.25           | 0.040**  |
| <i>HOSPAGE</i>                                    | 72.839    | 40.167    | 83.000      | 47.720    | -10.161          | 0.72            | 0.484    |
| n   | 62        |           | 13          |           |                  |                 |          |

  

| Panel B: Frequency Counts for Dichotomous Variables for 62 Hospitals with Audit (or Similar) Committees |   |   |
|---|---|---|
| Variable  | Number of Hospitals with Audit Committees Coded 1 | Number of Hospitals with Audit Committees Coded 0 |
| <i>ICPROB</i>   | 18 (29%)  | 44 (71%)  |
| <i>SIZE</i>   | 61 (98%)  | 1 (2%)  |
| <i>INDEP</i>  | 46 (74%)  | 16 (26%)  |
| <i>EXPERT</i>   | 54 (87%)  | 8 (13%)   |
| <i>MEET</i>   | 33 (53%)  | 29 (47%)  |
| <i>FDISTRESS</i>  | 18 (29%)  | 44 (71%)  |
| <i>CFOEXP</i>   | 56 (90%)  | 6 (10%)   |
| <i>BIG4</i>   | 42 (68%)  | 20 (32%)  |
| <i>IAUDIT</i>   | 42 (68%)  | 20 (32%)  |

\*, \*\*, \*\*\* = p-value < .10, .05, .01, respectively, one-tail if in predicted direction, two-tail otherwise.

+ Difference in means may actually be differences in percentage, where appropriate.

++ Test for significant differences in means.

AC sample is the sample of hospitals with audit committees.

NOAC sample is the sample of hospitals without audit committees.

Variable Definitions:

*ICPROB* = 1 for a hospital has internal control problems, and 0 otherwise;

*FDISTRESS* = 1 if the Altman's Z-Score is less than 2.6 (technically bankrupt), and 0 otherwise;

*CFOEXP* = 1 if the Chief Financial Officer (or Controller) has a CPA certification or previous experience in a similar capacity with another company, and 0 otherwise;

*BIG4* = 1 if audited by Big 4 accounting firm, and 0 otherwise;

*TENURE* = number of years the auditor has audited the client;

*IAUDIT* = 1 if internal audit function exists, and 0 otherwise;

*LASSET* = natural logarithm of total assets (in million);

*HOSPAGE* = number of years the hospital has been existed;

*SIZE* = 1 if an audit committee has at least three members, and 0 otherwise;

*INDEP* = 1 if audit committee members are totally independent, and 0 otherwise;

*EXPERT* = 1 if audit committee members with at least one financial expertise, and 0 otherwise;

*MEET* = 1 if an audit committee meets more than four times annually during the sample year, and 0 otherwise.

This panel A of table 3 reports the means (in some cases, percentages) and standard deviations for all 75 hospitals. The panel B of table 3 shows the results of frequency counts for dichotomous variables for 62 hospitals.

Panel B of Table 3 shows that 71 percent of the hospitals in our sample have no internal control problems and are not under financial distress. Ninety-eight percent of the sample hospitals have at least three members on the ACs. Seventy-four percent of the hospital ACs have fully independent members. Eighty-seven percent of our sixty-two hospitals have at least one financial expert on the ACs. In addition, slightly more than half of the hospitals in our sample meet more than four times annually. Of the 62 public hospitals in our sample, only 18 (29 percent) of the public hospitals had a “good” AC (e.g., had solely independent AC directors, had at least one financial expert, and met more than four times a year). Thus, this data suggests that there is a room for improvement with regard to the composition and functioning of public hospital ACs.

Support for Hypothesis 1 (H1)

Table 4 presents support for H1, additional to the positive results for *ICPROB* in Table 3. For those 13 hospitals without ACs (*AC* = 0), more than half (8) have problems, whereas for those with ACs (*AC* = 1), less than a third (18) have problems. For the twenty-six hospitals with internal control problems, sixteen have reportable conditions and ten have material weaknesses. Thirty-four of the 62 hospitals (55 percent) have an audit committee while the other 28 hospitals (45 percent) have committee that assume the roles similar to an audit committee (such as finance committee, finance and audit committee, fiscal affair committee, finance and compliance committee, financial review committee, and university audit committee).

Table 4: Chi-Square Analysis of All Reporting Hospitals

|               | Frequency | <i>AC</i> |    | n  |
|---------------|-----------|-----------|----|----|
|               |           | 1         | 0  |    |
| <i>ICPROB</i> | 1         | 18        | 8  | 26 |
|               | 0         | 44        | 5  | 49 |
|               | n         | 62        | 13 | 75 |
| Chi-Square    |           |           |    |    |
| P-value       |           | 0.025*    |    |    |

\* = *p*-value < .05.

Variable Definitions:

*ICPROB* = 1 if a hospital with internal control problems, and 0 otherwise;

*AC* = 1 if a hospital with an audit committee, and 0 otherwise;

Table 4 presents support for hypothesis 1 that the presence of an AC in public hospital is positively associated with the quality of the internal controls reported in government audits

Support for Hypothesis 2 (H2)

Table 5 shows, for H2, the results of the logistic regression model and the relationship between quality of the AC (size, independence, financial expertise, and meeting frequency) and the incidence of control problems (*ICPROB*). The first measure of quality, committee size (*SIZE*) is not related to control problems (*p*-value = 0.985 > 0.05). However, the other three characteristics are related. Those committees with solely independent members (*INDEP*, *p*-value = 0.05 < 0.10), possessing at least one financial expert (*EXPERT*, *p*-value = 0.036 < 0.05), and increased meeting frequency (*MEET*, *p*-value = 0.045 < 0.05) are negatively associated with the incidence of control problems. All one-tailed Chi-square *p*-values are in one sense two-tailed normal “z” values, so the argument that independence is related to control problems, the one-side argument, is then significant at *p*-value = 0.025 < 0.05.

Among the additional control variables, these control problems are positively related to the incidence of financial distress (*FDISTRESS*) (*p*-value = 0.027 < 0.05). The use of Big Four auditor (*BIG4*) (*p*-value

=0.029 < 0.05), and the number of years the hospital has been existed (p-value= 0.074 < 0.10) are negatively related to control problems, as anticipated. In addition, auditor tenure (*TENURE*, p-value =0.108) is not statistically significant but close, as these are two tail p-values, and has a negative sign suggesting the possibility that tenure could be a positive influence.

Table 5: Logistic Regression for the Incidence of Internal Control Problems for 62 Hospitals with Audit Committees

$$ICPROB = \alpha + \beta_1 SIZE + \beta_2 INDEP + \beta_3 EXPERT + \beta_4 MEET + \beta_5 FDISTRESS + \beta_6 CFOEXP + \beta_7 BIG4 + \beta_8 TENURE + \beta_9 LAUDIT + \beta_{10} LASSET + \beta_{11} HOSPAGE + \varepsilon$$

| Variable             | Expected Sign | Coefficient Estimate | Logistic p-value | Wald Chi-Square |
|----------------------|---------------|----------------------|------------------|-----------------|
| Intercept            | +/-           | 20.782               | 0.974            | 0.001           |
| <i>SIZE</i>          | -             | -10.753              | 0.985            | 0.000           |
| <i>INDEP</i>         | -             | -1.760               | 0.050*           | 3.829           |
| <i>EXPERT</i>        | -             | -3.223               | 0.036**          | 4.413           |
| <i>MEET</i>          | -             | -2.046               | 0.045**          | 4.008           |
| <i>FDISTRESS</i>     | +             | 1.940                | 0.027**          | 4.910           |
| <i>CFOEXP</i>        | -             | -0.396               | 0.762            | 0.092           |
| <i>BIG4</i>          | +/-           | -2.083               | 0.029**          | 4.755           |
| <i>TENURE</i>        | -             | -0.104               | 0.108            | 2.590           |
| <i>IAUDIT</i>        | -             | 0.202                | 0.843            | 0.039           |
| <i>LASSET</i>        | +/-           | -0.037               | 0.950            | 0.004           |
| <i>HOSPAGE</i>       | -             | -0.025               | 0.074*           | 3.204           |
| Chi-Square (p-value) |               |                      | 27.244           | 0.004           |
| Adjusted R           |               |                      | 0.203            |                 |
| N                    |               |                      | 62               |                 |

\* \*\* = p-value < .10, .05, respectively, one-tail if in predicted direction, two-tail otherwise.

Variable Definitions:

- ICPROB* = 1 if a hospital with internal control problems, and 0 otherwise;
  - SIZE* = 1 if an audit committee has at least three members, and 0 otherwise;
  - INDEP* = 1 if audit committee members are totally independent, and 0 otherwise;
  - EXPERT* = 1 if audit committee members with at least one financial expertise, and 0 otherwise;
  - MEET* = 1 if an audit committee meets more than four times annually during the sample year, and 0 otherwise;
  - FDISTRESS* = 1 if the Altman’s Z-Score is less than 2.6 (technically bankrupt), and 0 otherwise;
  - CFOEXP* = 1 if the Chief Financial Officer (or Controller) has a CPA certification or previous experience in a similar capacity with another company, and 0 otherwise;
  - BIG4* = 1 if audited by Big 4 accounting firm, and 0 otherwise;
  - TENURE* = number of years the auditor has audited the client;
  - IAUDIT* = 1 if internal audit function exists, and 0 otherwise;
  - LASSET* = natural logarithm of total assets (in million);
  - HOSPAGE* = number of years the hospital existed.
- $$ICPROB = \alpha + \beta_1 SIZE + \beta_2 INDEP + \beta_3 EXPERT + \beta_4 MEET + \beta_5 FDISTRESS + \beta_6 CFOEXP + \beta_7 BIG4 + \beta_8 TENURE + \beta_9 LAUDIT + \beta_{10} LASSET + \beta_{11} HOSPAGE + \varepsilon$$

This table 5 shows the logistic regression estimates of the equation:

### Sensitivity Analysis

What differentiates ACs is financial expertise. Of the 62 with ACs, forty hospitals with financial expertise do not have any control problems, whereas, only twenty-two with this expertise do. We examine whether public hospitals that have ACs with a financial expert are less likely to have more severe internal control problems, material weakness. Table 6 shows the severity of the internal control problem (material weakness) can be predicted best by the absence of financial expertise. Consistent with the findings found in publicly traded corporations by Krishnan (2005) and Zhang et al. (2007), we find that the ACs for those large hospitals possessing at least one financial expert (*EXPERT*) (p-value = 0.086 < 0.1) are less likely to have a material weakness in internal controls. Among the additional control

variables, management quality (*CFOEXP*, p-value = 0.109) is not statistically significant but close, as Table 6 presents two tail p-values, and has a negative sign suggesting the possibility that a CFO with a CPA certification or similar financial experience could be a positive influence.

Table 6: Logistic Regression for the Incidence of Material Weaknesses for 62 Hospitals with Audit Committees

$$MATWEAK = \alpha + \beta_1 SIZE + \beta_2 INDEP + \beta_3 EXPERT + \beta_4 MEET + \beta_5 FDISTRESS + \beta_6 CFOEXP + \beta_7 BIG4 + \beta_8 TENURE + \beta_9 LAUDIT + \beta_{10} LASSET + \beta_{11} HOSPAGE + \varepsilon$$

| Variable             | Expected Sign | Coefficient Estimate | Logistic p-value | Wald Chi-Square |
|----------------------|---------------|----------------------|------------------|-----------------|
| Intercept            | +/-           | -0.496               | 0.999            | 0.000           |
| <i>SIZE</i>          | -             | 14.254               | 0.985            | 0.000           |
| <i>INDEP</i>         | -             | -1.001               | 0.522            | 0.410           |
| <i>EXPERT</i>        | -             | -4.005               | 0.086*           | 2.947           |
| <i>MEET</i>          | -             | -1.690               | 0.257            | 1.285           |
| <i>FDISTRESS</i>     | +             | 1.197                | 0.251            | 1.319           |
| <i>CFOEXP</i>        | -             | -2.244               | 0.109            | 2.562           |
| <i>BIG4</i>          | +/-           | -0.301               | 0.800            | 0.064           |
| <i>TENURE</i>        | -             | -0.037               | 0.639            | 0.220           |
| <i>LAUDIT</i>        | -             | 1.878                | 0.261            | 1.265           |
| <i>LASSET</i>        | +/-           | -1.381               | 0.127            | 2.325           |
| <i>HOSPAGE</i>       | -             | -0.031               | 0.134            | 2.249           |
| Chi-Square (p-value) |               |                      | 13.181 (0.282)   |                 |
| N                    |               |                      | 62               |                 |

\* = p-value < .10, one-tail if in predicted direction, two-tail otherwise.

Variable Definitions:

- MATWEAK* = 1 if a hospital with material weaknesses, and 0 otherwise;
- SIZE* = 1 if an audit committee has at least three members, and 0 otherwise;
- INDEP* = 1 if audit committee members are totally independent, and 0 otherwise;
- EXPERT* = 1 if audit committee members with at least one financial expertise, and 0 otherwise;
- MEET* = 1 if an audit committee meets more than four times annually during the sample year, and 0 otherwise;
- FDISTRESS* = 1 if the Altman's Z-Score is less than 2.6 (technically bankrupt), and 0 otherwise;
- CFOEXP* = 1 if the Chief Financial Officer (or Controller) has a CPA certification or previous experience in a similar capacity with another company, and 0 otherwise;
- BIG4* = 1 if audited by Big 4 accounting firm, and 0 otherwise;
- TENURE* = number of years the auditor has audited the client;
- LAUDIT* = 1 if internal audit function exists, and 0 otherwise;
- LASSET* = natural logarithm of total assets (in million);
- HOSPAGE* = number of years the hospital existed.

This table 6 shows the absence of financial expertise predicts severity of the internal control problem (material weakness).

## CONCLUSION, LIMITATIONS, AND FUTURE STUDIES

In this study, we examine the association between the presence and quality characteristics of public hospital ACs and control problems over financial reporting and major Federal award programs. We test our hypotheses using all publicly available A-133 audit reports of the largest U.S. public hospitals and a follow-up study improving prior research that uses restricted settings or data (e.g., Carcello & Neal, 2003; Krishnan, 2005; Vermeer et al., 2006, 2009). From 75 audit reports, we find support for our hypotheses. Just the presence of an audit committee (H1), and especially one with independence, financial expertise, or increased activity (H2), improves internal control over financial reporting and major Federal awards. Specially, our results support the argument made by Vermeer et al. (2006) that nonprofit hospitals or universities that receive government grants, particularly those subject to the OMB Circular A-133 audit,

are more likely to have ACs that are effective in monitoring. The monitoring function of public hospital ACs increases when monitoring is a prerequisite for obtaining resources.

As in prior research, we find other variables as part of the control systems that influence the internal control quality. Auditor size or type is often associated with improved client internal controls (Ashbaugh-Skaife et al., 2007). This was found in nonprofits by Vermeer et al. (2006) but not in corporations by Krishnan (2005). In addition, we find older hospitals are more likely to have “ironed out the kinks” in their internal control processes (Doyle et al., 2007), not investigated by Krishnan (2005).

Consistent with the research in publicly traded corporations by Krishnan (2005) and Zhang et al. (2007), we find that the ACs for those large hospitals possessing at least one financial expert are less likely to have a material weakness in internal controls.

These specific findings extend results found in prior research to organizations with direct taxpayer support, extending this corporate governance research to large public hospitals (governmental setting) and answering questions found in prior research on nonprofit hospital setting (Vermeer et al., 2006; Pridgen & Wang, 2007).

Because only 75 A-133 audit reports are publicly available, the sample size limits this study. More reports may eventually become available because of increasing governmental standards for hospitals, but as these SOX measures are adopted by nonprofits (Iyer & Watkins, 2008), the number of hospitals without ACs is then also likely to decrease, removing the ability to measure the effect of the presence of an AC.

Similar to Krishnan (2005), we use the self-reported AC independence to proxy board independence. Future research can re-examine this proxy for those cases where board members are less likely to be non-independent or politically influenced, such as in the case of hospital districts, which remain autonomous, receive some governmental funding but are not subject to OMB A-133 audits. Unfortunately, without the A-133 audit report, it is difficult to objectively measure the hospital’s internal control problems. Additional research should include longitudinal study examining the development and maturity of these control committees over time (Miller-Millensen, 2003), and defining the financial expert as one with accounting (CFO, CEO, or auditor) or non-accounting expertise (SEC, 2003; Krishnan & Lee, 2009).

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