Effects Of A Decision Aid For The Assessment Of Fraudulent Financial Reporting: An Application Of SAS No. 82

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ABSTRACT

The Statement on Auditing Standards (SAS) No.82, Consideration of Fraud in a Financial Statement Audit, requires the auditor to assess the risk of material misstatement due to a fraud and to consider the assessment in designing appropriate audit procedures to be performed. The SAS No. 82 has thus explicitly made the detection of material fraud the auditor's responsibility. The purpose of the study is to use the risk factors identified in SAS No. 82 as the foundation to develop a decision aid to help auditors assess the likelihood of fraudulent financial reporting and to empirically test the effects of the decision aid on assessing the likelihood of fraudulent financial reporting. Using a sample of 45 fraud engagements and 206 nonfraud engagements, we developed and tested a logistic regression model that estimates the likelihood of fraudulent financial reporting. We found that the logistic model (proxied as a decision aid in the study) outperforms the practicing auditors in assessing risk for fraud and nonfraud cases.

INTRODUCTION

The audit quality of CPA firms has undergone a severe test recently and has caught numerous researchers' attention particularly due to the financial crisis and management fraud. Obviously, efforts have to be made to restore the public's confidence in auditors' integrity and ability in specific and to uphold the reputation of the profession in general. The fiasco of Enron scandal in 2001 has further alarmed regulators and the public in many countries on audit quality including those in Taiwan. However, its collapse came so suddenly and was not a result merely of commercial misfortune or personal crookedness. What has puzzled the public most was the fact that its auditor, Arthur Andersen LLP, one of the most resourceful CPA firms in the world, had not spotted the fraud earlier in the financial reports. Numerous questions remain unanswered; among them was a simple question like "could all these be stopped if the audit engagement was conducted by the book?"

The Statement on Auditing Standards (SAS) No.82, *Consideration of Fraud in a Financial Statement Audit*, requires the auditor to assess the risk of material misstatement due to a fraud and to consider the assessment in designing appropriate audit procedures to be performed. The SAS No. 82 has thus explicitly made the detection of material fraud the auditor's responsibility. Auditors are primarily concerned about fraud as it relates to misstatements in the financial statement (Bell & Carcello, 2000). According to SAS No. 82, fraud consists of fraudulent financial reporting and misappropriation of assets. Prior research has indicated that auditors' failure to detect fraudulent financial reporting could subject them to adverse legal consequences (Feroz et al., 1991; Carcello & Palmrose, 1994; Bell & Carcello, 2000). Thus, proper and timely plan for detecting fraudulent financial reporting is not only important to satisfy the SAS No. 82 requirement and to assure the audit quality but also crucial to the well-being of the profession. This responsibility for auditors to detect fraudulent financial reporting has increasing importance to the profession and society (Beasley et al., 2000; Boynton et al., 2001).

Research has shown that some efforts have been made to develop decision aids to help auditors solve complex problems (e.g., Loebbecke & Willingham, 1988; Eining et al., 1997; Bell & Carcello, 2000). Prior research has also

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shown that assessing the likelihood of fraudulent financial reporting was difficult for auditors because most of them had little experience and were not properly trained to do so (Loebbecke et al., 1989; Johnson et al., 1991; Eining et al., 1997). In addition, SAS No. 82 gives the requirement that likelihood of financial reporting must be assessed but gives little guidance on how the risk factors (used as red flags) described in the statement should be applied. Therefore, developing an appropriate decision aid has the potential of helping auditors accomplish and fulfill the requirement of assessing the likelihood of fraudulent financial reporting and thus enhance audit quality. Thus, the purpose of the study is to use the risk factors identified in SAS No. 82 as the foundation to develop a decision aid to help auditors assess the likelihood of fraudulent financial reporting and to empirically test the effects of the decision aid on assessing the likelihood of fraudulent financial reporting.

The remainder of the paper proceeds as follows. The next section reviews the relevant literature and develops the hypotheses. The third section discusses the method used to conduct our study and presents the results from the study. Finally, the last section discusses our conclusion, implication, and suggestions of the study.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Assessment of Fraudulent Financial Reporting

The concern with the increasing incidence of fraudulent financial reporting and the problems of detecting fraud has been widely expressed by the accounting profession, the users of financial statements, and the government (Church et al., 2001). In response to the growing concerns with the incidence of financial statement fraud, the Auditing Standards Board has issued SAS No. 82, *Consideration of Fraud in a Financial Statement Audit*, which requires the auditor to assess the risk factors of material misstatement due to fraudulent financial reporting in every audit. It is a refinement of SAS No. 53 in which fraudulent financial reporting was termed as management fraud. SAS No. 82[2] has made assessment of the likelihood of fraudulent financial reporting the auditor's responsibility and the auditor has to "obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud" (AICPA, 1997). One frequently cited cause of audit failure is auditors' lack of awareness of the warning signs of fraud. If auditors could better understand these warning signs and exercise professional skepticism, their risk of not detecting fraud would decrease (Heiman-Hoffma & Morgan, 1996). The SAS No. 82 represents the profession's response and effort to improve auditors' understanding of the warning signs. The 2001 bankruptcy scandal of Enron has further forced the society to pay more attention to auditors' ability and legal liability to spot the early signs of fraud. Auditors' need to assess and detect fraudulent financial reporting is not just a fulfillment of the SAS requirement but a matter of the profession's future.

The Use of Decision Aids

Research has shown that large public accounting firms apply different levels of systemization (i.e., structure) to their audit decision-making processes (Cushing & Loebbecke, 1986; Kinney, 1986; Eining et al., 1997; Rudolph & Welker, 1998). Increased structure in the audit process has been characterized by some (e.g., Sullivan, 1984) as a positive development because it should increase judgment consensus (Ashton, 1983; McDaniel, 1990) and efficiency (Mullarkey, 1984; Cushing & Loebbecke, 1986; McDaniel, 1990). A structured approach commonly adopted by accounting firms is the use of decision aids in audit decision making. Rohrman (1986, p. 365) defines a decision aid as "any explicit procedure for the generation, evaluation, and selection of alternatives (courses of action) that is designed for practical application and multiple use."

Decision aids are designed and implemented to help people make better decisions when solving difficult problems. They are typically designed to accomplish specific objectives (see Timmermans, 1991; Wisuda, 1985). For instance, an objective of decision aids is to counter systematic errors in judgment (e.g., Tversky & Kahneman, 1974; Kahneman et al., 1982) resulting from the automatic (without conscious thought) mental processing of information (see Keren, 1990). Another objective of decision aids helps decision makers to simplify the cognitively difficult process of evaluating and assimilating the wealth of information applicable to solving complex problems. A feature common to

[2] In October 2002, the SAS No. 99, Consideration of Fraud in a Financial Statement Audit has been issued in the U.S. It is considered a revision of SAS No. 82. However, when the study was conducted, the SAS No. 99 or its similar version was not issued in Taiwan. So, we still used the SAS No. 82 for the study.

many decision aids is that they function by decomposing the problem in some fashion. Research has established that decomposition aids benefit decision making when applied to solving complex problems (e.g., Peterson & Pitz, 1986; Libby & Libby, 1989; Ashton, 1992).

Auditing researchers have investigated the advantages of using decomposition decision aids to solve audit problems. These include: (a) Jiambalvo & Waller (1984), Libby & Libby (1989), and Kachelmeier & Messier (1990) for aids that decompose the problem by attributes, (b) Butler (1985) for an attention-directing aid, (c) McDaniel (1990) for structured guidance, (d) Ashton (1992) for an aid providing a predicted solution, (e) Heintz et al., (1996) for an aid generating a suggested "best" solution, (f) Loebbecke & Willingham (1988), Loebbecke et al., (1989), Bell et al., (1993), Eining et al., (1997), and Bell & Carcello (200) for decision aids that provide an assessment of the likelihood of management fraud or fraudulent financial reporting, and (g) Rose & Wolfe (2000) for a computerized aid for tax decision. However, the studied aids were not shown to be beneficial in every case. Butler (1985), McDaniel (1990), and Libby & Libby (1989) indicated support for decision aid use, whereas studies by Kachelmeier & Messier (1990) and Jiambalvo & Waller (1984) did not. Ashton's (1992) results provided inconclusive support of decision aids in auditing. While judgment aided by a predictive model was superior to unaided judgment, it was not superior to the predictiveness of the model. Heintz et al. (1996) failed to find a clear improvement on efficiency in team decision making, but suggest that decision aids may be used in highly structured firms as a means by which information is gathered from subordinate audit team members. More recently, Lowe et al. (2002) provided evidence that decision aids can have positive, negative, or neutral effects on auditors' legal liability, depending on how auditors use the decision aid and the reliability of the aid.

There are several drawbacks related to the kinds of auditing decision aids typically used by public accounting firms and studied by accounting researchers that may explain why some aids do not assist audit decision making. The kinds of decision aids in use by public accounting firms (and, as a consequence, typically selected for study by auditing researchers) are highly prescriptive approaches to the way a decision should be made (e.g., normative aids) or the manner in which information should be evaluated and assimilated (e.g., firm- or researcher-specified attributes for recomposition in deomposition-recomposition aids). They typically are developed to aid the solution of specific auditing problems, such as selecting sample size (Butler, 1985; McDaniel, 1990), establishing materiality levels (Pany and Wheeler., 1989; Heintz et al., 1996), and assessing control risk (Libby et al., 1989; Jiambalvo and Waller, 1984).

Timmermans (1991) argues that aids designed more to optimize or arrive at a "normatively" correct solution may not "support" decision makers because of their rigidness and unadaptability to the characteristics (strengths and weaknesses) of the user. Normative rules or guidance may be incongruous with the decision maker's representation of the problem. In these instances, the decision aid may be difficult to incorporate into an auditor's desired solution process and may lead to confusion. In fact, some (e.g., Abdolmohammadi, 1991a; 1991b) suggest that attempts to use an incompatible decision aid may add to the complexity of a problem and lead to worse decision making. For instance, audit quality may be impaired by fixating auditors on the decision aid and its output (Sullivan, 1984), which may: (1) prompt auditors to disregard or de-emphasize relevant problem attributes and information; (2) impede auditors' ability to adapt to new situations by de-sensitizing them to conditions outside the domain of the decision aid, and (3) lead to misapplication of the decision aid in situations that, on surface, appear suited to the intended purpose of the decision aid.

Decision Analysis

Decision analysis is a generalized approach to decomposing complex decision making in such a way that it illuminates problem complexity and provides the decision maker with insight into the problem (Keeney, 1982). Decision analysis aids fall within the general category of decision aids that decompose problems into constituent parts for separate evaluation. In general, their objective is to ease the cognitive strain needed to apply analytic thinking to solve highly complex problems (e.g., auditor's determination of whether to give a "going concern" opinion or to accept a new client) (Timmermans, 1991). An analytic thought process is distinguishable from holistic decision making, where the problem is solved by "intuition" rather than decomposition. In an intuitive approach to decision making, memory nodes are activated automatically, without control by the individual. Analytic thinking requires the application of controlled thought, where memory nodes are searched under the control of the decision maker.

Some decision makers have better developed memory structures than others and consequently are better

adapted to applying controlled thought to complex problems. It is well established, however, that humans (even experts) are poorly equipped for analytical thinking, due to limits on the number of pieces (chunks) of conceptual information that can be processed in short-term memory at one time (Miller, 1956) and inadequacies in the nodal structuring of long-term memory that impede the storage and retrieval of declarative knowledge (Shiffrin, 1976). Thus, analytic decision making is cognitively effortful and characterized by the use of search heuristics to simplify the process of evaluating the large amount of information applicable to complex problems (Payne, 1982). Decision analysis aids, by decomposing complex problems into more manageable parts, are designed to compensate for such memory limitations (Timmermans, 1991) by facilitating the processing of greater amounts of information. In short, they attempt "… to capture a bigger share of the 'real problem'" (Keeney, 1982, p. 823). In addition, decision analysis aids may be acceptable to both accounting firms and auditors because they provide the firm with explicit justification for the judgment while allowing the individual auditor freedom to specify the factors which are relevant to the judgment.

The study explored the benefits of an alternative, less prescriptive form of decision aid than those typically available for aiding the solution of complex auditing problems.

Fraudulent Financial Reporting and Decision Aids

Prior research has proposed a management fraud checklist to serve as a memory aid to help auditors identify all potential red flags on a particular audit (e.g., Pincus, 1989). Pincus (1989) however found that unaided users outperformed the users with the checklist, probably because checklists gave no mechanical help of weighting and combining the red flag cues into an overall assessment. Statistical models can be used to mechanically weigh and combine cues into a judgment because statistical models are generally more consistent and accurate than human judgments (Einhorn, 1972; Kleinmuntz, 1990; Eining et al., 1997). This is particularly true when the decision aid and the human judgment are accessed to the same cues (Blattberg & Hoch, 1990; Eining et al., 1997).

Loebbecke and Willingham (1988) developed a model that proposes under three situations (conditions, motivation, attitude) that fraudulent financial reporting might take place. The fraud-risk factors identified during assessment of the SEC Accounting and Auditing Enforcement Releases were mapped into the three components of their model. Similar frameworks that discuss the conditions under which fraudulent financial reporting might have been penetrated have also appeared in the literature (e.g., Romney et al., 1980; Uecker et al., 1981). Loebbecke et al. (1989) examined the above model using 77 cases of material financial reporting fraud and found that at least one risk factor was present in all three components of L/W model for a majority of the cases. However, with a fraud-only sample, it is impossible to examine the discriminatory power of the model.

Bell et al. (1991) developed a logistic regression model, capable of converting risk factors into an assessment of fraudulent financial reporting. They used 77 fraud cases from Loebbecke et al., (1989) and 305 non-fraud cases. These cases were randomly partitioned into an estimation sample and a holdout sample. Bell and Carcello (2000) used the same data to further examine the effects of the logistic statistical model as a decision aid to assess the likelihood of fraudulent financial reporting. Eining et al. (1997) argued that the "dialogue" between the user and aid was a critical element in the use of decision aids. They conducted an experiment to test the auditors' reliance on an expert system decision aid when assessing management fraud risk and found the users of the expert system decision aid outperformed all others.

Hypothesis

As mentioned previously, the main purpose of the study is to develop a decision aid that can help auditors assess the likelihood of fraudulent financial reporting and test the effects of the aid in the assessment. Thus, the main testable hypothesis of the study, based on the above discussion, will be:

H1: Auditors using the logistic regression model will discriminate better than checklist users or unaided auditors when assessing the likelihood of fraudulent financial reporting.

METHODOLOGY AND RESULTS

Questionnaire And Procedure

The study performed the following steps to develop the questionnaire used in the study: First, the 37 risk factors described in Profession Standards (AU 316) were used as the preliminary foundation to solicit opinions of practicing CPAs, preferably managers or partners who had encountered the intended assessment. These examples of risk factors relating to fraudulent financial reporting are grouped into three categories: (1) management's characteristics and influence over the control environment, (2) industry conditions, and (3) operating characteristics and financial stability. Inexperienced auditors would not be suitable for the evaluation. After this preliminary discussion and interviews with some experienced CPAs, a first draft of the questionnaire was produced. Each frau-risk factor was phrased into a question. Subjects were asked to give their binary answer of presence/absence (yes or no) to each of the questions. A pilot test was performed to assure the face and content validity of the questionnaire. The questionnaire includes demographic section and the fraud case section.

Second, the top twenty CPA firms in Taiwan were invited to participate in the study. Certain efforts were made to ensure there are enough sample for the study. Due to the relative infrequency of fraudulent financial reporting, we dated back 10 years (1994-2004). If the fraud sample is not enough, then we would further date back or increase the number of CPA firms involved to obtain enough fraud cases. Our goal is to have at least 30 fraud cases to run a meaningful test. Recent cases are preferred because subjects may not have complete memory of old cases. Once enough sample is committed, the questionnaires were distributed to the subjects. In some cases, personal interview would be necessary.

Subjects

The subjects in the study were experienced auditors, such as managers or partners. They must have encountered the assessment of fraudulent financial reporting and made the fraud versus non-fraud decisions before. One subject provides only one audit engagement. In a rare situation, one subject may have to provide more than one audit engagement for the study.

Development and Use of the Logistic Regression Model

After the data have been collected and coded, a series of univariate analyses was performed on the fraud-risk factors. The purposes of the analyses include test for classificatory power, Chi-square test of independence, phi coefficients, etc. The ultimate reason for the univariate analyses is to guide the development of a logistic regression model. Combinations of the risk factors that are significant in the univariate analyses were tested in many models. In order to do so, the entire sample was randomly split into an estimation sample and a holdout sample. The estimation sample was used to estimate the models and the holdout sample was used to compare and assess their predictive abilities. This logistic regression model is actually a computerized decision aid that is designed to help auditors assess the likelihood of fraudulent financial reporting. Several analyses were performed to test the effects of the model by comparing the aid and unaided auditor judgments on the assessment of fraud and non-fraud cases.

Results

With great efforts to recruiting especially the fraud engagements, we ended up with having 45 fraud engagements and 206 nonfraud engagements for the study. All the engagements came from the top 20 CPA firms in Taiwan. Subjects participated in the study were senior managers or managers, as expected for the study. Since the purpose of the study is to verify the effects of SAS No. 82 as a decision aid for assessing the probability of fraudulent financial reporting, we performed all the tests performed by Bell and Carcello (2000) who conducted the study on the effects of SAS No. 53. We successfully replicated the main result of Bell and Carcello (2000) that a simple decision aid (the logistic model in the study) outperforms the practicing auditors in assessing risk for fraud observations. The logistic model performs very well in discriminating between fraud and nonfraud observations. Unlike Bell and Carcello 2000), we also found a significant difference between model assessments and those of practicing auditors for the sample of nonfraud cases. We further found our results hold whether the participating auditors used the checklists or did use any aid at all. Therefore, our hypothesis is supported. However, we had a very interesting finding that a great majority of the participating auditors (88%) answered that they had doubts on the logistic model and would rather use

the risk factor checklists or their experience for making judgments. They were surprised to know the results of the study and seemed ready to put more faith on decision aids for their audit engagements.

CONCLUSIONS

Importance Of The Study

The importance of the study bears on the fact that the SAS No. 82 requirement has made assessing the likelihood of fraudulent financial reporting the auditors' responsibility and any deviation from the requirement would most likely expose the auditors to legal and regulatory liabilities. Research also indicates that the study is on the mainstream of the auditing research. The study uses a different approach from any other studies documented in the literature in Taiwan. Plus, it represents the first attempt in Taiwan to help auditors develop a practical and useful decision aid and bring their practice to the SAS No. 82 requirements. It is therefore expected that the results from the study should make some impacts to the practice of the profession and the discipline of the auditing research.

Our study successfully replicates the main effect of Bell and Carcello (2000) that a simple decision aid (the logistic model in the study) outperforms the practicing auditors in assessing risk for fraud observations. The logistic model performs very well in discriminating between fraud and nonfraud observations. Unlike Bell and Carcello 2000), we also found a significant difference between model assessments and those of practicing auditors for the sample of nonfraud cases. Even with complex analyses and good results, the Bell and Carcello (2000) study could not overlook the fact that risk factors employed in their study were not the new SAS No. 82 requirement and the fraud and non-fraud cases were not from the same time frame. Their study basically was a replication of Loebbecke et al. (1989), especially they used the same data. Compared to the Bell and Carcello (2000) study, this study has less sample for both fraud and nonfraud cases. In addition, although subjects in the study were all very experienced (they were either senior managers or partners), most of them were generally reluctant to participate in the study.

Suggestions

The effects of decision aids are well established in the literature. However, the biggest shortcoming of most decision aids is that they interfere with decision makers' expertise and pattern recognition (Chang, 1998). They leave no chance and time for decision makers to re-recognize or re-learn the pattern of decomposed pieces. It must be remembered that the purpose of decision aids is to augment rather than replace human judgment. A better approach would be to combine humans and decision models by providing the output from decision models as an additional input to the human decision process (Ashton, 1992). With the use of decision aids, decision makers may be freed from routine problem solving and, therefore, can spend more time with creative matters.

In fact, the essence of decision aids is to help decision makers make better decisions in terms of their intended purpose. However, both cost and benefits of using decision aids must be equally examined in order to validate their use (Ashton & Willingham, 1989). Fischhoff (1982) argues that using decision aids is likely to be preferable to training when it is possible to restructure the decision task to be more compatible with the decision maker's information-processing capabilities, or when the success of training efforts is uncertain. To get the best benefits from decision aids, a model of decision analysis should interactively consist of the decision maker, the task, and the decision aid. These components influence both the decision process and eventually the decision outcome.

Despite all the effort that has gone into the development of decision aids, numerous research has indicated that decision makers are often reluctant to rely on them (Arkes et al., 1986; Ashton, 1992, 1992; Boatsman et al., 1997; Whitecotton, 1996). Auditors would most likely repudiate incompatible aids, even when their use is recommended by the firm. For instance, Abdolmohammadi (1991a; 1991b) found that a typical reaction by auditors to decision support systems was non-acceptance for the majority of audit judgment tasks. Ashton (1990) even suggested that enhanced performance pressure could force the decision maker to outperform the decision aid by developing and adopting other strategies instead of accepting the aid's recommendation (thus resulting in worse performance). This lack of reliance on decision aids may come from the decision maker's overconfidence of his own ability and/or under-confidence in the ability of the aid (Ashton, 1990; Whitecotton, 1996; Eining et al., 1997). These studies suggest that the degree of reliance on decision aids may depend upon how the "dialogue" can be established between the auditor and the aid

(Eining et al., 1997).

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