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Project Title: Using Nonfinancial Measures to Assess the Risk of Fraudulent Financial Reporting and Improve Retail Investor Protection

Type of Grant: (check one)

X Research ___Education ___Combination Education and Research

Grant Cycle: (check only one)

___ 2007 General Grant Program First Cycle: February 26, 2007
X Improving Investor Protection RFP: June 11, 2007
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Amount Requested: $330,980 Project Duration: 18 months

Project Summary: (Maximum of 250 words—do not exceed the space remaining on this page.)

Retail investors have been reluctant to use nonfinancial measures when selecting investments. This proposal outlines a research project that will help investors use nonfinancial data to make safer investment decisions. Financial statement fraud (hereafter, fraud) often leads to substantial losses to participants in capital markets. In response, internal and external stakeholders are pressuring firms to improve the transparency of their financial reporting by disclosing more nonfinancial measures (NFMs) in their annual reports. While there is a growing body of research related to NFMs, no prior studies have examined the extent to which NFMs can be used as a benchmark for evaluating the validity of financial information and analyzing the potential for fraud. Initial results from an empirical investigation, using a matched-pairs design of fraud and non-fraud firms, suggest that such an analysis can be efficiently performed and provide investors with relevant information to base their investment decisions.

This proposal outlines a research project that will entail completing the aforementioned empirical analysis and developing a fraud analysis tool, using experimental methods to determine how auditors and retail investors can use our fraud analysis tool to assess fraud risk, and integrating the findings from this research to create a web-based tool for investors to use prior to investment decisions. Deliverables include academic papers, investor briefs, formal policy recommendations in a white paper, and the web-based tool.
Section B: Proposal Requirements

1. Qualifications of Organization, Project Principal, Project Team (limit to one page)

a. Organization

This project will be run through the College of Management at North Carolina State University. North Carolina State University is a constituent institution of the University of North Carolina (UNC) system. According to The UNC Code, North Carolina State University shall have a board of trustees composed of thirteen persons: eight are elected by the UNC Board of Governors, four are appointed by the governor, and the remaining member is the president of the student government, ex officio. Please see Attachment E (from the prior submission) for the board of trustees list. The College of Management was created in 1992, but the history of economics, business and management education at North Carolina State University goes back to the early 1900s. The College is led by Dean Ira Weiss who oversees department heads in four academic departments, including the Department of Accounting headed by Dr. Frank Buckless. The college’s mission is to educate tomorrow's leaders through the University's active integration of teaching, research and engagement. The college creates an innovative and intellectual environment with a focus on leadership and management in a technology-rich, global marketplace. In 2005-2006 the College of Management received $1.7 million in new research awards continuing a 10-year trend of growth in the College’s research portfolio. As a constituent college of North Carolina State University, the College of Management is supported by the full infrastructure of a research extensive university.

b. Project Principal

Joseph Brazel is an Assistant Professor of Accounting at North Carolina State University. His research focuses on nonfinancial measures, fraud detection, fraud brainstorming, and judgment and decision-making in auditing. Brazel has published papers in two of the elite academic journals in accounting, *The Accounting Review* and *Contemporary Accounting Research*, as well as others. He has also disseminated his academic research to non-academics through numerous presentations to practitioner groups and publications in *The CPA Journal* and *Strategic Finance*. The Institute of Management Accountants, the Institute of Internal Auditors, and North Carolina State University have all supplied Dr. Brazel with grants to support his research. Brazel has consulted for the Federal Reserve and is currently serving as an expert advisor and witness in a litigation case related to financial statement fraud. He has extensive experience with experimental design, cognitive psychology research, and the analysis of fraud. Dr. Brazel will provide rigor to the experimental methods used to evaluate the individual decision-making processes of retail investors and auditors.

c. Project Collaborators and Partners (if applicable)

Keith Jones is an Assistant Professor of Accounting at George Mason University. His research focuses on nonfinancial measures, fraudulent financial reporting, and earnings management. His research has been presented at top academic conferences around the world including the International Symposium on Audit Research in Sydney, Australia and Shanghai, China. The Institute of Internal Auditors and George Mason University have supplied Dr. Jones with grants to support his research. Keith has extensive experience in empirical methods and evaluating archival data related to nonfinancial measures, financial measures and the capital markets.
2. Detailed Project Description

a. Project Overview

Retail investors have made investment decisions based upon fraudulently reported financial statements and the cost to these individuals has been staggering. Glass Lewis & Co. (2005) estimated that a number of high profile frauds led to the loss of almost $900 billion in market capitalization from 1997 to 2004. Consequently, efforts to improve fraud assessment have been met with great interest and a cost-effective tool which would assist investors evaluate fraud risk would be extremely valuable. The comparison of financial statement information to related nonfinancial measures (NFMs) can potentially serve as an effective tool for retail investors conducting due diligence before committing to an investment. While recent events suggest that financial statements can be fraudulently manipulated, certain nonfinancial measures (e.g., number of retail outlets, number of employees) are often highly correlated with financial measures (e.g., revenues), objective and easily verified, and less accessible to manipulation by fraud perpetrators (e.g., PCAOB 2004; Bell et al. 2005; Lundholm and McVay 2006). Thus, inconsistencies (consistencies) between financial performance and NFMs should indicate a high (low) fraud risk investment. Recent reports in the popular press suggest such an analysis would be extremely beneficial to investors (e.g., WSJ 2005; Lundegaard 2005; Eisinger 2005).

Consider the following specific example as a case in point. It is important to note that all of the data provided below were easily accessible to investors in one source: the 10K filing. Del Global Technologies (hereafter, Del Global) makes electronic components, assemblies, and systems for medical, industrial, and defense uses. The Securities and Exchange Commission alleges that in fiscal years 1997-2000 Del Global engaged in improper revenue recognition when it held open quarters, prematurely shipped products to third-party warehouses, and recorded sales on products that they had not yet manufactured (SEC 2004). Del Global overstated pretax income in 1997 by at least $3.7 million or 110% and revenue increased 25 percent from $43.7 million in 1996 to $54.7 million in 1997. These impressive financial results were reported while the company reported that employees decreased from 440 in 1996 to 412 in 1997. Additionally, Del Global’s total distribution dealers decreased from 400 to 250 from 1996 to 1997. The Del Global case illustrates how an unusual relationship between NFMs (i.e., total number of employees and total number of distribution dealers) and financial data (i.e., revenue) could raise red flags when assessing fraud risk. In contrast, one of Del Global’s competitors, Fischer Imaging Corp., realized a 27 percent decrease in revenue over the same period accompanied by a comparable 20 percent decrease in employees and a seven percent decrease in distribution dealers.

The objectives/goals of this proposal are to develop and empirically validate a simple, cost-effective fraud assessment tool which compares growth in financial measures to related NFMs, examine how retail investors can be taught to use the tool and make safer investment decisions, evaluate how auditors (a safeguard to investors) can use the tool to prevent fraudulent financial statements being provided to investors, and develop a web-based tool for investors which reflects these research studies. The research to meet these objectives will unfold in four phases:

1) First, we have already collected a proprietary database of financial statement frauds from the dissemination of SEC Accounting and Auditing Enforcement Releases issued during the period of 1987-2005. We are currently in the process of matching a sample of these fraud firms with competitors and collecting financial statement data, relevant control variables suggested by the fraud literature, and various NFMs from 10K filings. See Brazel et al. (2007a) for a current
working paper detailing these efforts. This working paper describes our development and empirical validation of a fraud analysis tool. The tool is a simple measure that compares a firm’s percent change in revenue from the previous year with its percent change in nonfinancial measures. The tool could be used by retail investors while conducting due diligence prior to investment, auditors in their consideration of fraud (to prevent fraudulent financial statement from being disseminated to investors), or the SEC as part of their corporate finance reviews. The tool (which is explained in detail in the procedures and methodology section below) developed in the paper is simplistic in nature and efficient to use because the data can be collected from one source: 10K filings/annual reports (although NFMs collected from other sources could be used).

Revenues are utilized as the financial measure in this study due to the concentration of frauds and restatements related to improper revenue recognition (e.g., Beasley et al. 1999; Gullapalli 2005). If fraud firms do not manipulate their NFMs in a manner that is consistent with their financial performance and if NFMs can be identified that are normally positively correlated with financial performance, then unexpected differences between NFMs and financial performance should help discriminate fraud from non-fraud firms. We are currently in the process of validating the measure with our sample and have found some very interesting results. We find a single NFM (number of employees) is highly correlated with revenues and is publicly available for all but one firm in our sample, using only employees as an NFM discriminates fraud firms from non-fraud competitors, using multiple industry-specific NFMs provides results consistent with that obtained using number of employees, the average difference between revenue growth and employee growth for our fraud firms (.29) is substantially larger than that of non-fraud firms (.08), and these averages could serve as baselines for retail investors using this tool. While our results related to this phase of research will fuel the subsequent phases detailed below, much work is needed to be done. The review process at an elite accounting journal (e.g., Journal of Accounting Research) may require us to expand our sample, collect additional data, and perform additional statistical analyses. While this process will provide additional rigor to this phase of research, it will require substantial time from the research team. Lastly, the preliminary results of this paper are already informing public policy in the audit setting (Hogan et al. 2006). The PCAOB has recently recognized the potential for NFMs to be a powerful, independent benchmark for evaluating financial statement data and have recently endorsed their usage to improve fraud detection (PCAOB 2007). We hope our research can have a similar impact for retail investors.

2) Second, through the use of experimental case studies, we will investigate if retail investors voluntarily compare NFMs to financial measures when they assess investment opportunities and the extent to which factors can increase their usage of NFMs. Holder-Webb et al. (2007) conclude there is variation in the disclosure of NFMs, while Brazel et al. (2007a) find that the types of NFMs disclosures are fairly consistent within industries (between competitors). Some recent research suggests that investors do base investment decisions on NFMs (Jackson 2006). We will continue this stream of research to examine if investors: (without explicit instruction) base their investment decisions on non-operational information (e.g., word of mouth) rather than financial measures or NFMs, seek out NFM disclosures, compare NFMs to financial measures, and obtain competitors’ data on NFM/financial measures relationships to serve as a base. Given the effectiveness of the tool described in Phase 1, we will also experimentally examine if any of the following can spur investors to employ our tool during their investment screening process: the current level of
fraudulent behavior in the market, the availability of XBRL (which allows for financial measures to be extracted from 10K disclosures), or the provision of a prototype of our web-based tool (Phase 4 deliverable). Thus, Phase 2 of the study will provide both descriptive and prescriptive evidence regarding retail investor usage of NFMs to assess fraud risk. We will also examine if the use of our tool affects investor performance as we will examine investor investment decisions in both fraud (disguised) and non-fraud settings. This will allow us to investigate whether the use of our tool provides investors with the ability to evade investments in fraudulent companies and/or spurs them to invest in non-fraud companies where growth in their financial measures is supported by similar growth in NFMs.

3) Third, we will examine auditor usage of our tool in their consideration of fraud. There is a growing recognition in the literature that the financial statements disseminated to investors are a product of management and their auditors (e.g., Trotman et al. 2005). To the extent that auditor fraud detection can be improved, retail investors are less likely to be provided with fraudulent financial data to base their investment decisions. Still, prior research and recent frauds/audit failures (e.g., Gemstar) suggest that auditors have difficulties detecting fraud and are particularly inept in developing testing procedures designed to detect fraud (Hogan et al. 2006; Brazel et al. 2007b). Using the tool developed and validated in Phase 1 should enhance auditors’ fraud risk assessments and abilities to detect fraud. As the difference between revenue growth and NFM growth increases to an unreasonable level, and management cannot explain and provide corroborating evidence to support the inconsistency, it can serve as a tipping point at which the auditor expends additional resources to detect fraud (e.g., inclusion of forensic specialists on the engagement team). As stated previously, if the guardians of investors (e.g., auditors, internal auditors, audit committees) can improve their ability to detect fraud, retail investors are less likely to base their investment decisions on fraudulent financial data. Similar to Phase 2, we will obtain both descriptive and prescriptive evidence regarding auditors’ use of NFMs through experimental case studies. Of particular interest is whether environmental conditions (e.g., level of client incentives to commit fraud) increase the usage of NFMs or whether explicit testing guidance, as suggested by the PCAOB (2007), is required to spur auditor usage of our tool. Similar to Phase 2, auditor judgments will be examined in both fraud (disguised) and non-fraud setting to study the effectiveness of the tool to identify fraud and the extent to which the tool generates costly, false-positive conclusions. Also, in some experimental conditions, auditors will be provided with a prototype of our web-based tool (Phase 4 deliverable) to enhance the effectiveness of their audit procedures. Studying both investor and auditor usage of this tool in Phases 2 and 3 will enhance our ability to develop an effective web-based tool in Phase 4.

4) Fourth, we will develop a web-based application for our tool. We will contract with software engineers (either in partnership with the software engineering department at one of our universities or with an outside consulting firm) to develop “web crawling” software to search a company’s 10-K, identify relevant NFMs, export the NFMs as well as financial measures to a platform designed to manipulate data (e.g., Microsoft Excel), and identify large differences between changes in NFMs and financial measures. We anticipate that the user will be able to enter a ticker symbol or company name and the tool will retrieve the NFMs reported in the company’s most recent 10-Ks and compare NFM and financial measures.
Included in the four phases above are the production of academic research papers for publication, subsequent non-academic pieces which will disseminate our findings in a user-friendly format to investors, auditors, regulators, and boards of directors, a white paper summarizing all four phases of the project for the purposes of affecting public policy (e.g., increasing director oversight with respect to financial measures and NFMs, PCAOB required audit procedures in relation to fraud detection), and a web-based tool for retail investors to use prior to making investment decisions.

b. **Target Audience**

The research findings will be especially helpful to retail investors. The main objective of this research project is to develop, empirically validate, and experimentally investigate investor usage of a cost-effective tool to assess the risk of fraud during their investment screening process. The chief deliverable of this project is a web-based tool for investors to use prior to making investment decisions. The results of this project will also inform regulators, analysts, broker/dealers, auditors, boards of directors, and audit committees who serve individual investors as advisors and guardians. The findings of our studies will be legitimized by publications in peer-reviewed academic journals and then be subsequently disseminated to the aforementioned parties through a variety of non-academic publications (e.g., a white paper which summarizes the findings of our four phases of research, research briefs provided to FINRA).

b. **Project Scope**

In the first phase of the study, the researchers will continue to refine and increase the rigor of the Brazel et al. (2007a) study. Our fraud sample currently consists of 69 matched-pairs. This sample size is comparable to or greater than the sample sizes of previous fraud studies published in top-tier academic business journals (e.g., Beasley 1996; Erickson et al. 2006). As indicated above, this process includes completing the peer-review process and publishing the study in a top-tier academic journal. The second phase of the project will employ a large sample of individual investors, drawn from several metropolitan locations and other sources, to complete our experimental instrument. For the third phase, we will have auditors from national and international (Big Four) audit firms complete our experimental instrument. Overall, we believe that the use of these samples will allow us to generalize our results to the U.S. population of financial frauds, investors, and auditors. In the fourth phase, we will integrate the findings from the aforementioned research studies to develop a user-friendly, web-based tool which collects relevant data and automates the comparison of financial data and NFMs for retail investors.

c. **Situation Analysis**

During former HealthSouth CEO Richard Scrushy’s trial, federal prosecutors argued that Scrushy must have known something was amiss with HealthSouth’s financial statements since there was a discrepancy between the company’s financial and non-financial performance. The prosecutor noted that twice during the seven-year fraud, revenues and assets increased even though the number of HealthSouth facilities decreased. “And that’s not a red flag to you?” asked prosecutor Colleen Conry during the trial (WSJ 2005). The defense witness responded that the inconsistency was not apparent at the time and—importantly—HealthSouth’s external auditors also failed to take note of the inconsistency between the firm’s financial and nonfinancial measures. Also, given that retail investors were caught off guard by the HealthSouth fraud, it can be concluded that many investors also failed to identify the inconsistency.
The above example is just one of many from our sample of frauds in Brazel et al. (2007a). In short, Brazel et al. (2007a) empirically illustrates that governance mechanisms (e.g., audit committees) and investor safeguards (e.g., auditors) have failed in the past to explicitly consider whether reported financial data is supported by related NFM. Thus, our research project is imperative in that it empirically examines how auditors, and others, can use our tool to lessen the probability that retail investors are supplied fraudulent financial statements. Still, time constraints, the inability to change ways of thinking, and other factors may still prohibit those charged with protecting investors from detecting fraud via our tool. It is important therefore to measure the extent to which retail investors can employ our tool in their screening process and investigate ways in which its usage can be increased and its effectiveness for investors improved. As stated previously, the vast majority of NFM collected by Brazel et al. (2007a) were obtained from the exact same 10K filing which contained fraudulent financial statements. Thus, we believe our tool represents a cost-effective method of fraud evaluation that can be automated into a web-based fraud risk assessment tool. While the study of NFM has become a growing body of research, no prior study has examined how NFM can be incorporated into a fraud assessment tool to improve the fraud detection of investor guardians and the due diligence processes of investors prior to investment.

**d. Project Goals and Objectives**

- **Project Goals**
  
  The objectives/goals of this proposal are to (1) develop and empirically validate a simple, cost-effective fraud assessment tool which compares growth in financial measures to related NFM, (2) examine how retail investors can be taught to use the tool and make safer investment decisions, (3) evaluate how auditors (a safeguard to investors) can use the tool to prevent fraudulent financial statements being provided to investors, and (4) develop a web-based tool for investors which reflects the findings of these research studies.

- **Objectives**
  
  The completeness and success of the aforementioned goals will be measured by the publication our findings (related to Phases 1-3) in academic research journals to ensure the validity of our conclusions, the dissemination of non-academic pieces based on the aforementioned results to provide practical recommendations and guidelines to investors, auditors, etc., the presentation of our findings to academic and investor groups, the incorporation of our findings into our teaching curriculum (as well as other academics), the completion of a white paper summarizing the accomplishment of the four aforementioned goals and how our findings can affect policy in the areas of NFM disclosures to investors, corporate governance, regulation, and audit methodology. Lastly, our final objective is to supply retail investors with the web-based tool to enhance their ability to assess fraud risk prior to investment.

**e. Procedures and Methodology**

- **Project Implementation Procedures and Methods**
  
  As noted, the project will proceed in four phases:

  **Phase 1** consists of a matched-pairs design of fraud firms and non-fraud competitors. For each firm we measure *(our tool)*:

  \[ \text{Diff}_t = \frac{(\text{Rev}_t - \text{Rev}_{t-1})}{\text{Rev}_{t-1}} - \frac{(\text{NFM}_t - \text{NFM}_{t-1})}{\text{NFM}_{t-1}} \]

  where, Rev = total revenue; NFM = nonfinancial measure or mean of nonfinancial measures if greater than one NFM available; \( t \) = year of the fraud.
We then perform a comparison of means to determine if \( \text{Diff} \) is larger for fraud firms (greater inconsistencies between financial growth and NFM growth). We conclude our testing by including \( \text{Diff} \) in a logistic regression that controls for variables (e.g., percentage of insiders on the board of directors) found to discriminate fraud from non-fraud firms in prior studies. Brazel et al. (2007a) provides further detail regarding the methods employed for our Phase 1 study. As indicated previously, the review process at an elite academic journal (e.g., *Journal of Accounting Research*) may require us to expand our sample, collect additional data, and perform additional statistical analyses. While this process will provide additional rigor to this phase of research, it will require substantial time from the research team. What can be concluded from our Phase 1 research to date is that we have reason to believe that we have developed and empirically validated a cost-effective fraud assessment tool for auditors and retail investors.

**Phase 2** will be performed via experimental case studies completed by retail investor participants. All pre-testing of the experimental cases will be performed with MBA students serving as proxies for retail investors. Elliot et al. (2007) describe why MBA students are a good proxy for nonprofessional investors and find the information searches, information integration, and investment decisions of MBA students to be similar to that of nonprofessional investors. Still, after using MBA students to refine our instrument, manipulations, etc., we will have retail investors complete the experiment. For the sample of retail investors, a vendor (described in Attachment B – Line Budget) will be used to recruit retail investors, ensure an adequate response rate, eliminate technological breakdowns, and provide an adequate and representative sample. All independent variables (described below) will be manipulated between participants via the creation of multiple case studies. To evaluate the use of our tool in fraud and non-fraud settings, we will develop cases drawn from the firms in Phase 1 to develop both a fraud (disguised) and non-fraud case. We will also be sure to select a non-fraud firm in our case that has had a steady increase in stock valuation since \( t \), thus we can measure investor performance (i.e., conclude that investment in the fraud (non-fraud) firm is a poor (strong) investment). To examine if investors use the tool for investment decisions (either with or without influences to use the tool), we will manipulate the extent to which NFMs are inconsistent or consistent with other information concerning the firm in the case (e.g., financial data, market reports, competitor data, word of mouth). Lastly, to determine what factors influence investors use of NFMs, we will manipulate the availability of XBRL, the extent of fraudulent financial behavior existing in the markets, and the provision of a prototype of our web-based tool. The case studies will collect a host of dependent variables from investors, including their perceptions, information searches, and investment decisions.

**Phase 3** will also be conducted via experimental case studies, but the participants will be auditors placed in a hypothetical audit setting. Stage I of the case provides all participants with a substantive analytical procedures task for several properly stated account balances/ratios, provides them with options (and related data) for developing an expectation for the given account balances/ratios, and measures which data source(s) participants chose to use when developing their expectations of the account balances/ratios. Consistent with professional standards, participants will be able to develop their expectations from prior year balances/ratios, client budgeted amounts, competitor/industry financial information, NFMs, etc. (AICPA 1988). By performing Stage I, we will gather descriptive data related to the propensity of auditors to choose NFMs as a source for developing expectations of financial data. In Stage II, All participants will be assigned to a client that has fraudulently overstated revenues (disguised and
obtained from our Phase 1 sample). We will manipulate the audit team’s initial fraud risk assessment (high or low) and the provision of a prototype of our web-based tool. Dependent variables that we will collect include an expected value for the current year revenue account (and sources used to develop the expectation), the extent of proposed revenue testing post-analytical procedures, whether a forensic specialist should be consulted, and a proposed audit adjustment (if any). Auditor performance in Stage II will be objectively judged as we will have the size of the restatement (overstatement of revenue) for the fraud firm in the case.

**Phase 4** will run simultaneously with Phases 1 through 3 and consist of the development of a web-based application for our tool. We will contract with the software engineering department at one of our universities or with an outside software engineering firm to develop a web-crawling program to search a company’s 10-K filing and identify relevant NFMs. The user will enter a ticker symbol or company name and the program will export the NFMs and financial data to a data-analysis platform (e.g. Microsoft Excel) and calculate \( \text{DIFF}_t \). The web-crawling software will need an extensive database of search terms in order to retrieve relevant NFMs in a company’s 10-K. We have created a large database of search terms from our research in Brazel et al. (2007a) that we can use to initiate the development of the web-based tool at the inception of the project. The tool development will evolve as we test its use with investors and auditors during Phases 2 and 3. We anticipate interaction between the user and the tool. For example, we anticipate that the web-based tool will allow users to add NFMs they have identified in other sources (e.g. trade journals, government databases) to the calculation of \( \text{DIFF}_t \), subtract NFMs they may consider less relevant, as well as compare NFMs to financial measures other than revenue (e.g., total assets). In order to verify the accuracy of the web-based tool, we will employ a research assistant to work closely with the software engineer. The research assistant will be reading numerous 10-Ks and hand-collecting NFM data to ensure the web-crawler has identified all the relevant NFMs. The research assistant will also recalculate \( \text{DIFF}_t \) to ensure the accuracy of the tool’s output. As reported above, NFMs vary from company to company and industry to industry. Therefore, the research assistant and the web-crawler will need to search 10-Ks and compare results across a wide spectrum of companies spread across numerous industries to ensure the accuracy and relevance of the NFM data. We will work with FINRA to identify the most suitable website to host the web-based tool.

- **Implementation Rationale**

We will be able to implement the four phases of our project due to the positive, initial results obtained from Brazel et al. (2007a), the knowledge Dr. Brazel and Dr. Jones have derived from that study, and the expertise levels of Dr. Brazel and Dr. Jones in the areas of experimental and archival methods, respectively. Anticipated barriers to the project include access to investor and auditor participants and the expertise required to develop the web-based tool. As noted previously, we intend to engage outside vendors to assist us in accessing investor participants and developing the web-based tool. As suggested by Elliott et al. (2007), we will also use MBA students (as proxies for retail investors) to refine our experimental instrument and therefore make the most efficient use of investor participants.

With respect to accessing auditor participants, we will begin the process of recruiting these participants early in the research project (during Phase 1), add another researcher to the research team (relating only to the academic paper) who provides training to one of the Big Four accounting firms (allowing for substantial, one-time access), and exhaust all personal contacts that Dr. Brazel and Dr. Jones have accumulated with the Big Four and national
accounting firms. It should also be noted that Dr. Brazel has successfully completed five prior experimental studies requiring a similar number of auditors to serve as participants. The additional researcher that we are adding to the research paper has completed over a dozen such experiments with auditors. Lastly, it is anticipated that the Department of Accounting at North Carolina State University will be hiring a national audit partner from one of the Big Four accounting firms to serve on its faculty (thus providing additional contacts to access auditor participants). Given our combined experiences in performing experiments with auditors and the resources described above, we do not anticipate having any difficulties in obtaining a sample of Big Four and national auditors to complete Phase 3.

- **Replication**
  All of the project’s studies will be replicable. For example, Brazel et al. (2007a) uses only publicly available data and identifies all data sources used.

- **Evaluation**
  Information regarding the evaluation of the project’s general goals is presented in Section 2 d. above. Also, it should be noted that, during the experimental phases of this project, both investors and auditors will be using a prototype of our web-based tool. Therefore, during the course of our experimentation we will be able to evaluate: these individuals’ propensity to use the tool, manners in which its usage can be increased, and how the web-based tool contributes to better investor decision-making (i.e., avoiding fraud investments) or audit effectiveness (i.e., detecting fraud). We also describe above how a research assistant will be employed to validate the accuracy of the web-based tool’s output prior to supplying the tool to the investing public (through hand collection of financial data and NFM and manual recalculation of Diff).

- **Research & Combination Proposals — Data Sources**
  Data sources described above include: 10K filings (NFM and financial measures), proprietary databases (fraud firm and competitor data), Compustat (financial control variables and filing dates), proxies (governance control variables), and experimental instruments (investor and auditor NFM usage data). The reliability of our findings will be enhanced by having our results published in peer-reviewed academic journals, obtaining sample sizes equivalent to prior studies of fraud, and the project’s use of both archival and experimental methods (e.g., experiments provide the advantage of a controlled setting (causality), while archival data provides empirical evidence from data drawn directly from the environment under study). Levitt and Dubner (2005) posit that one reason academics know very little about the practicalities of fraud is the paucity of good data. Our project will add data and knowledge to our understanding of fraud.

f. **Project Outcomes and Deliverables**

  The project will result in four key outcomes. We will provide retail investors, and those charged with guarding investors, with a cost-effective, empirically validated tool to assess the risk of fraud during their due diligence prior to investment (Phase 1). We will assess the extent to which investors choose to use our tool (or NFM in general) and investigate ways in which retail investors can benefit from its use (Phases 2). We will determine how audit quality and, in turn, the reliability of financial statement provided to investors can be improved through auditor use of our tool (Phase 3). Lastly, we will incorporate the knowledge derived from these studies to develop a web-based tool that allows investors to assess the likelihood of fraud prior to investing (Phase 4).
Deliverables from the project will include: three academic publications reflecting Phases 1-3 of the project, investor and auditor briefs for the FINRA and other interested parties (e.g., auditor practitioner journals), databases/experimental instruments, a white paper for policy-makers (e.g., PCAOB) and the FINRA, presentations to academic and investor audiences, as well the FINRA and policy-makers (if invited), and the aforementioned web-based tool for the retail investing public and other interested parties (e.g., auditors, regulators). We anticipate the auditor-related deliverables, a white paper for the PCAOB, and the provision of auditor briefs to the major accounting firms (specifically detailing our findings from Phases 1 and 3) will motivate experienced auditors and audit firms to embrace our tool. The white paper should cause the PCAOB to explicitly note the effectiveness of NFM in a future PCAOB standard on fraud and the executive briefs will provide empirical support for those at the audit firms wishing to adjust their audit methodology/incorporate NFM into their testing procedures. Lastly, the web-based tool we will develop in Phase 4 will make the inclusion of NFM into auditor testing a very efficient process.

- **Research & Combination Proposals — Implications**

The implications of our four phases of research include equipping retail investors and academics with an automated tool and an innovative, yet simple, way to assess the likelihood of fraud. In short, our project should provide empirical evidence to support its usage and experimental evidence to suggest how it can be used. We also hope that our research will shed new light on the under-researched area of fraud and spur researchers to think about new ways and new datasets that will improve the public’s ability to detect when financial statement data seems too good to be true.

### 3. Distribution Plan

**a. Dissemination and Marketing Plan** (must be detailed)

As discussed throughout this proposal, our distribution plan is two-fold. First, we will educate the guardians of retail investors (e.g., auditors, audit committees, regulators) with respect to our web-based tool. Second, we will directly expose retail investors to our web-based tool. Retail investors will be provided with briefs of our academic research papers, given presentations when requested (as well as any other communication methods the FINRA deems effective), and exposed to our web-based tool thru the FINRA website. We will follow a similar plan for auditors and other guardians. Policy makers (SEC and PCAOB) will be provided with a white paper detailing the policy ramifications of our research and presentations if requested. For academics, we will present our findings at academic conferences and three academic research papers will be submitted for publication in leading business journals (with the objective of affecting their research and teaching). Lastly, students, tomorrow’s investors and guardians, will be made aware of our findings as they will be incorporated into our curriculum.

**b. Outreach Methodologies**

The College of Management of North Carolina State University and the School of Management of George Mason University will assist us in delivering the findings of our research to investors, policy makers, and audit firms. These Universities, and the faculty and research centers contained therein, have built relationships with these target audiences. The media representatives of the College and the School will aid us in disseminating our findings to the popular press. We will be also assisted by the American Accounting Association, as
well as other academic groups which support conferences and journals, for the dissemination of our research to academics.
References


### Attachment A—Milestones and Deliverables

(Start and end dates should be sequential and day specific.)

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Start Date</th>
<th>End Date</th>
<th>Primary Activities</th>
<th>Deliverables to be Submitted in Addition to Progress Report</th>
</tr>
</thead>
</table>
| #1        | January 15, 2008 | May 1, 2008 | - Completion of Phase 1: additional data collection/statistical analyses for Brazel et al. (2007a).<sup>a</sup>
- Completion of Phase 1 academic paper (Brazel et al. 2007a) and responding to peer-review process.<sup>a</sup>
- Creation of Phase 1 investor brief/non-academic paper for FINRA.
- Begin recruitment of MBA students / retail investors (contract with outside vendor) and auditors (e.g., arrange for access to training sessions) for Phases 2 and 3, respectively.
- Beginning of Phase 2: development of experimental case studies for investor participants.
- Beginning of Phase 4: development of web-based tool for FINRA. Investigators contract with outside vendor for development of web-based tool and start preliminary work on tool development. | - Phase 1 academic paper
- Phase 1 investor brief/non-academic paper for FINRA
- Phase 1 database |
| #2        | May 1, 2008     | September 1, 2008 | - Obtain IRB approval of investor experimental case studies.<sup>b</sup>
- Completion of Phase 2: collection of data and data analysis.
- Completion of Phase 2 academic paper and submission of paper for publication.
- Creation of Phase 2 investor brief/non-academic paper for FINRA. | - Experimental case studies for investors
- Phase 2 academic paper
- Phase 2 investor brief/non-academic paper for FINRA
- Phase 2 database |
|   |   | investor brief/non-academic paper for FINRA.  
|---|---|---|
|   |   | • Presentation of Phase 2 findings to academic audiences and invited investor conferences.  
|   |   | • Beginning of Phase 3: development of experimental case studies for auditor participants.  
| #3 | September 1, 2008 | February 1, 2009  
|   |   | • Obtain IRB approval of auditor experimental case studies.  
|   |   | • Distribute experimental case studies to auditor participants.  
|   |   | • Completion of Phase 3: collection of data and data analysis.  
|   |   | • Completion of Phase 3 academic paper and submission of paper for publication.  
|   |   | • Creation of Phase 3 auditor brief/non-academic paper for FINRA.  
|   |   | • Presentation of Phase 3 findings to academic audiences and invited auditor groups.  
|   |   | • Testing of Phase 4. Employ research assistant to test accuracy of web-based tool by hand-collecting NFMs and comparing to output from web-based tool.  
| #4 | February 1, 2009 | June 1, 2009  
|   |   | • Phase 4: refinement of web-based tool to make content and output interactive with user.  
| #5 | June 1, 2009 (continues after project is completed) | July 15, 2009  
|   |   | • Creation of white paper summarizing findings from Phases 1-4.  
|   |   | • Submission of white paper to policy-makers  
|   |   | • If invited, create policy presentation of white paper for FINRA and policy makers.  
|   |   | • Dissemination of Phase 1-
4 findings through general media and business press.

a While Brazel et al (2007a) is a completed working paper and has currently been revised and resubmitted for a second round of review at the *Journal of Accounting Research*, we anticipate that the process of revising and publishing the paper will require substantial additional effort due to future reviewer comments (e.g., expansion of sample size, collection of additional control variables, enhancement of econometric/statistical analyses) from additional rounds of review (i.e., top-tier accounting journals tend to require 3-5 rounds of review). Second and third round reviews at top-tier accounting journals typically require a substantial amount of additional data collection and analysis. While the review process at the *Journal of Accounting Research* will be rigorous, we feel that the validation of our Phase 1 findings in such a prestigious peer-reviewed academic journal is essential to the project’s success.

b The Internal Review Board (IRB) approval process cannot be begun until the final experimental instrument is completed and submitted to the IRB at North Carolina State University. Therefore, IRB approvals cannot be obtained during the first milestone and must be obtained after our instruments are completed (during Milestones 2 and 3). Because participation in the study by auditors and investors will be anonymous (demographic data will be obtained), we anticipate, and have confirmed with discussions with the IRB, that we will receive an exemption from the IRB. The exemption process with the IRB is typically a very efficient process.