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AN INVESTIGATION INTO

PCAOB REPORTING DEFICIENCIES

A Dissertation Presented

by

JAMES SAMUEL WAINBERG

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

September 2010

Isenberg School of Management

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AN INVESTIGATION INTO

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A Dissertation Presented

by

JAMES SAMUEL WAINBERG

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DEDICATION

For my wife, Eliza

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I would like to thank my good friend and advisor, Tom Kida, for his invaluable guidance and support throughout my years in the Ph.D. program. I feel extremely fortunate to have been taken under the wing of someone with his capability and terrific sense of humor. Who knew that accounting research could generate so many laughs? Though often quite difficult, these were truly the best years of my life and I would not hesitate doing it all over again.

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ABSTRACT

AN INVESTIGATION INTO

PCAOB REPORTING DEFICIENCIES

SEPTEMBER 2010

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The PCAOB inspection reports for large audit firms are primarily anecdotal in nature, providing only a list of deficiencies found without any statistical context (e.g., the inspection sample size). This is problematic when trying to determine the extent of a firm's audit weaknesses. However, simply adding statistical data to the reports, as currently provided in the PCAOB reports of small firms, may not solve the problem. Prior research suggests that statistical data are often ignored or underweighted when anecdotal data are present. This study investigates whether a bias for anecdotal data overwhelms the statistical data as currently presented in small firm reports, and whether any anecdotal bias can be overcome by possible decision aids. I first demonstrate that the anecdotal data presented in PCAOB reports can lead to incorrect perceptions of audit firms. I then find that the PCAOB's practice of providing statistical context in small firm reports is ineffective; that is, users continue to focus on anecdotal data even in the presence of informative statistical data. Finally, I provide evidence to indicate that two easily implemented decision aids can successfully help incorporate statistical data into perceptions of audit firms, resulting in more informed audit engagement decisions.

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CHAPTER 1

INTRODUCTION

The Sarbanes-Oxley Act of 2002 created the Public Company Accounting Oversight Board (PCAOB) to restore confidence in audited financial statements. The PCAOB has effectively replaced the AICPA's practice of peer review, which had previously served as the industry's measure of audit firm quality. Since 2003, the PCAOB has inspected the audit firms of SEC issuers and made public their inspection reports. As a result, PCAOB inspection reports have become the audit industry's de facto independent measure of audit firm performance.

The extent to which the PCAOB has been effective in providing useful information is under question. For example, the US Department of the Treasury's Advisory Committee on the Auditing Profession (2008, 114) has warned that within the current PCAOB regulatory environment, there is "minimal publicly available information regarding indicators of audit quality at individual auditing firms," and that "it is difficult to determine whether audit committees…have the tools that are useful in assessing audit quality that would contribute to making the initial auditor selection and subsequent auditor retention evaluation process more informed and meaningful." So while the PCAOB has succeeded in providing independent reporting on firm audit performance, the "inspection reports still aren't the scorecards of auditing expertise that corporations and investors had hoped for" (Whitehouse 2009, 1).

Currently, the PCAOB issues two types of inspection reports depending on whether the audit firm is large or small, and these reports differ in terms of the

information provided.[1] Reports for large firms are primarily anecdotal in nature and have been criticized for failing to provide any information that would help a user gauge the extent of the weaknesses found (BDO Seidman 2008). That is, the reports provide vivid descriptions of each audit deficiency identified, but are devoid of any statistical context for assessing the relative frequency of the deficiencies found (e.g., the number of audits inspected to find these deficiencies, the number of audits with no deficiencies found).[2] For example, if the PCAOB reports four deficiencies for a certain audit firm, users of that information do not know if ten audits were inspected or if only two had been inspected. As a result, information is not presented to adequately assess firm performance.

The PCAOB reports for small firms provide basic contextual statistical information that would allow the reader to determine the relative frequency of audit deficiencies. These reports include the number of audits sampled and the number of audits where deficiencies were found, along with the listing of specific deficiencies. While an obvious solution would be to simply include this kind of scope information in large firm reports, that inclusion may not have the anticipated effect of providing sufficient context. Prior research in psychology, accounting and other fields suggests that we have an inherent bias for anecdotal data (Kida 2006; Green et al. 2000; Fagerlin et al. 2005; de Wit et al. 2008; Kazoleas 1993; Wainberg et al. 2010). That is, statistical data are often ignored or underweighted when anecdotal data are present. This bias is especially likely to occur in small firm reports because the statistical data are embedded in the text preceding the deficiencies listed, increasing the likelihood that this information

[1] Large firms are classified as having more than 100 public clients while small firms have 100 or fewer clients.
[2] Deficiencies refer to problems or weaknesses that are generally departures from GAAP or GAAS.

will be overlooked. As a result, even if statistical data were provided, as in small firm reports, it may be overshadowed by the more vivid anecdotes listed.

The preference for anecdotal data is a robust and broad-based phenomenon and has been observed across a wide variety of decision making contexts. The most common reason given for this bias is that stories are generally more vivid and memorable than statistical forms of evidence (Nisbett and Borgida 1975; Hamill et al. 1980; Kazoleas 1993; Baesler 1997). The vividness of stories can lead to an increase in the availability of its message, overwhelming the often more informative statistical data (de Wit et al. 2008; Block and Keller 1997). The question therefore arises: Does an anecdotal bias exist when users evaluate the information provided in PCAOB inspection reports?

The PCAOB and the Regulatory Environment

The passage of the Sarbanes-Oxley Act of 2002 (SOX) effectively brought to an end an era of self-regulation and oversight in the U.S. audit industry. Congress moved quickly to pass the Act as a response to the audit failures that shook the public markets at the turn of this century.[3] Section 101 of the Act created the PCAOB to provide an independent oversight of the audit industry, making clear its directive "to oversee the audit of public companies that are subject to the securities laws, and related matters, in order to protect the interests of investors and further the public interest in the preparation of informative, accurate, and independent audit reports for companies" (SOX 2002, 750).

[3] Notable failures include Enron, Tyco, Global Crossing, AOL, Adelphia, Cendant, Worldcom, Merck & Co., Kmart, IMClone Systems, Sunbeam, Qwest Communications, Xerox, & Waste Management.

Prior to SOX, the U.S. audit industry had used the AICPA's triennial peer reviews as its primary mechanism for quality control oversight. While self-regulation had its faults, peer review provided some measure of relative audit quality that could be used by audit committees, boards of directors, and shareholders (e.g., see Hilary and Lennox 2005). With the passage of SOX, however, the peer review process was supplanted by PCAOB inspection reports.

By replacing the AICPA peer review, the PCAOB inspection reports have effectively become the audit industry's independent measure of auditor performance. While PCAOB disclaimers caution against using the reports as a balanced assessment of firm quality, they have done little to stop the financial press from publicizing the results with reputation-challenging headlines that chastise firms for poor performance. For example, headlines stating "Audit Watchdog Report Raps Ernst, KPMG" (Wall Street Journal 2007), "PCAOB Cites PwC, Crowe for Shoddy Auditing," (Compliance Week 2008), or "Failing Grades for E&Y, KPMG" (CFO Magazine 2008) give the impression that these large firms are not providing high quality audit services. In addition, firms with relatively 'clean' inspection reports frequently use them as evidence to market the high quality of services they provide (Whitehouse 2009).

Whether via sensationalized media accounts or from the reports themselves, negative publicity can have a serious effect on public perceptions of audit firm quality. A firm's reputation for quality is a fundamental determinant of its ability to attract and retain clients, and may affect the level of audit fees it charges (Chaney and Philipich 2002). To defend their reputations, firms frequently issue strongly worded response letters claiming that the deficiencies listed in PCAOB reports are isolated instances and

disagreeing with the evaluations expressed. For example, BDO Seidman (2008, 1) complained that the "design of the draft Report does not provide a comprehensive description of the procedures that were performed… or other information that may provide additional context for understanding the nature or frequency of the findings." Needless to say, audit firms view PCAOB inspection reports as potential threats to their reputations, and have noted and complained about the lack of statistical context.

The PCAOB currently uses two different reporting styles for large and small firms. Large firm reports contain vivid, detailed descriptions of deficiencies found, without providing any statistical context for assessing the relative frequency of those deficiencies (e.g., the total number of audits the PCAOB inspected). This can have significant implications for perceptions of audit firm quality if users only rely on the number of weaknesses listed without taking any statistical context into account.

For example, a firm receiving four deficiencies in its inspection report may have had as many as twelve audits inspected by the PCAOB (i.e., 0.25 deficiencies per audit inspected) or only one audit inspected (i.e., 4.0 deficiencies per audit). Focusing on anecdotal information alone, as large firm PCAOB inspection reports do, can lead to incorrect impressions of a firm. That is, without statistical information, users of the reports have no basis for assessing the relative frequency of the firm's audit deficiencies.[4]

[4] When deficiencies are listed and described without any reference to the number of audits inspected, it can negatively impact the perception of the firm. For example, in their 2007 inspection reports, the PCAOB cited PwC with seven and Crowe Chizek and Company with five deficiencies in total, prompting the Compliance Week (2008) headline: "PCAOB Cites PwC, Crowe for Shoddy Auditing." While finding five to seven deficiencies in a small number of audits inspected might indicate 'shoddy auditing,' finding this same number in a very large inspection sample of audits would probably not.

Providing statistical information in the reports of large firms, as is currently presented in small firm reports, would appear to be a simple solution to this problem of context deficiency. However, this alone may not provide the comparative indicators of balanced reporting sought by the industry. Prior research suggests that statistical evidence is often ignored and/or underweighted in the presence of less informative anecdotal data (see, e.g., Kida 2006). This is likely to be exacerbated by the fact that the statistical information provided in small firm reports is embedded in the boilerplate text preceding the anecdotal deficiencies, making it easily overlooked.[5] As a result, even if statistics are provided, they may still be overlooked if attention is not drawn to them. This could have significant implications for assessing firm weaknesses. That is, firms that have the greatest absolute number of weaknesses reported, without taking into account the size of the sample taken, would be viewed more negatively than firms having fewer deficiencies, but with a higher ratio of deficiencies per audit.

Stories vs. Statistics

As humans, we appear to be predisposed to make inductive generalizations about the world by taking single accounts (i.e., stories, anecdotes, testimonials) and extrapolating to the population as a whole. Research in psychology, accounting, and other fields of behavioral research suggest that people often ignore the limitations imposed by sample size when making inductive generalizations. In particular, research suggests that we prefer stories over statistics (Kida 2006; Hamill et al. 1980; Borgida and Nisbett

[5] For example, the following standard introduction was taken from a random small firm report: "The inspection procedures included a review of aspects of the Firm's auditing of financial statements of six issuers….The deficiencies identified in three of the audits reviewed included deficiencies of such significance that it appeared to the inspection team that the Firm did not obtain sufficient competent evidential matter to support its opinion on the issuers financial statements" (PCAOB Release no. 104-2008-097, 5).

1977; Zillmann 1999; Green et al. 2001; Fagerlin et al. 2005; de Wit et al. 2008; Wainberg et al. 2010).

This preference for processing stories is believed to have originated as a result of our social and cognitive evolution (Landau 1984). Human knowledge and wisdom have historically been passed down from one generation to the next by stories or personal narratives. While story-telling dates back into human pre-history, statistical forms of data collection and presentation are a relatively new concept (Kida 2006). In fact, in evolutionary terms, we've only recently begun recording and storing data using external sources. As a result, humans do not appear to be 'hard-wired' to process statistics as they are stories.

Studies across a number of fields have provided evidence for the existence of story, or anecdotal, preferences. For example, Hamill et al. (1980) investigated the extent to which people make generalizations to a population based on a single anecdote, even after being warned that it was atypical of the population as a whole. They had participants watch a videotaped interview of a prison guard that appeared to be either humane or inhumane. Participants were either told that the person was typical, or atypical, of prison guards in general, and then asked to make assessments about the characteristics and intentions of prison guard populations. Results indicated that participants reacted to the characteristics of the single prison guard in the interview, and generalized what they observed to the population as whole with little attention given to the warning that the guard was atypical.

In an accounting context, Wainberg et al. (2010) found that managers were more likely to make inferior capital investment decisions when provided with an anecdote that

conflicted with relevant statistical data. In that study, participants were given statistical data based upon reviews of hundreds of users of equipment under consideration and a single anecdote from a colleague expressing dissatisfaction with the statistically superior choice. Managers overwhelmingly ignored the statistical data in favor of the anecdote and elected to purchase equipment that was inferior in quality and more costly to operate. In a second experiment, they found that auditors conducting analytical review significantly underweighted the diagnostic value of statistical data in favor of the general implications provided by anecdotal data.

In a medical study, de Wit et al. (2008) found that participants who received anecdotal evidence presented in the form of a personal written account about the risks and dangers associated with certain sexual behaviors were more likely to report an intention to change their risky behavior as compared to participants given only statistical evidence of risk. In addition, Borgida and Nisbett (1977) found that face-to-face testimonials were more persuasive than statistical data in a study designed to measure participant's subsequent intention to take college courses, while Kazoleas (1993) found that participants exposed to anecdotal versus statistical forms of evidence were more likely to recall information and have attitude changes that were persistent over time.

Our preference for anecdotal over statistical data are also supported by transportation theory (Green et al. 2002), which proposes that a story's ability to 'transport' the listener into the narrative world can make the narrative experience seem more like a direct experience. Since direct experiences have a powerful effect on the formation of beliefs and attitudes, evidence capable of eliciting this type of processing can be formidably persuasive (Green and Brock, 2000; Fazio and Zanna 1981; Zillmann

and Brosius 2000). According to Green and Brock (2001), the greater the imagery invoked by a story, the greater the transportation of its reader and the more persuasive its message will be. Transportation theory is consistent with Tversky and Kahneman's (1973) availability heuristic, in that images that are more easily brought to mind give the impression of greater frequency of occurrence and plausibility.

Absent statistical data, the PCAOB inspection reports for large audit firms are purely anecdotal, providing no context for assessing the frequency of weaknesses found. Moreover, including statistical data in the format currently used by the PCAOB for small firm reports may not be sufficient to counter the impact of the anecdotal data. Why would that occur? Prior research indicates that we preferentially attend to anecdotal data and that this bias is prevalent across a wide variety of decision making contexts. In addition, the statistics provided in the reports of small firms are buried in the boilerplate introduction used by the PCAOB, making them easy to overlook.

Enhanced Statistical Presentation

If participants ignore or underweight statistical data as now presented in small firm reports, the question arises as to what can be done to enhance attention to that information. Prior research has found that the use of statistical data can be increased by enhancing the vividness and presentation of the statistical information. For example, Fagerlin et al. (2005) investigated how anecdotal reasoning in a medical treatment decision could be reduced by the use of pictographs. Participants were provided with both anecdotal and statistical data relating to treatments for angina – balloon angioplasty and bypass surgery. The anecdotal data provided a description of former patient experiences

with each of the treatments, while statistical data indicated that the bypass surgery had a 75% cure rate versus 50% for the balloon angioplasty. Participant treatment choices were consistent with anecdotal biases except when pictographs, drawing attention to the statistical information, were employed.[6]

If the statistical data in small firm PCAOB reports is pallid by comparison to the vividness of anecdotal accounts of deficiencies noted, then elaboration and enhancement of the statistical data may be able to increase its salience. For example, a PCAOB report listing three deficiencies found at ten clients inspected could be elaborated on to highlight those areas where, in fact, no deficiencies were found (i.e., seven out of the ten clients had no deficiencies). In addition, enhancing the vividness of the statistical data could be achieved by placing it into a table along with the elaborations discussed, thereby increasing its chances of being attended to.

Judgment Orientation

Judgment Orientation refers to how a person will perceive a given task and the types of evidence they will attend to as a result of that orientation (Zukier and Pepitone 1984). Epstein et al. (1992) propose that if a rational orientation is taken by decision makers, they will more likely engage their critical cognitive faculties. For example, Dennis and Babrow (2005) gave participants either a 'scientific' or an 'intuitive' orientation prior to receiving both statistical and anecdotal evidence concerning a medical diagnosis. Participants in the scientific orientation condition were told that the study had been "sponsored by the 'Center for Research in Scientific Thinking' and that they should

[6] The pictograph showed the number of people out of 100 expected to be cured by a given procedure by shading in that fraction of the figures provided in the graph.

make their judgment as would a scientist analyzing data." In the intuitive condition, participants were told that the study was "sponsored by the 'Center for Personal Decision-Making Studies' and that they should make judgments based on sensitivity and general knowledge." Participants in the 'intuitive' orientation condition showed a preferential assimilation and weighting of anecdotal information, whereas those in the 'scientific' orientation condition were more attentive to the statistical data.

In a capital budgeting context, Wainberg et al. (2010) had managers choose from among three capital investment options. Given both statistical and anecdotal data, managers overwhelmingly ignored the statistical data in favor of the anecdotal, and a significant reduction in anecdotal bias occurred when managers were given a judgment orientation. Some participants were given a definition of 'scientific thinking' and how science generally progresses through "the deliberate process of obtaining quantifiable evidence through observation and/or experimentation." They were further instructed to make their judgments by analyzing the information in the way that a 'scientist' would, thereby promoting a rational orientation, as described by Epstein et al. (1992). This scientific judgment orientation decision aid proved very effective at focusing managers' attention on the statistical data.

As discussed previously, we do not appear be 'hard-wired' to attend to statistical data. If users of PCAOB inspection reports are biased towards processing anecdotal data, then simple enhancement and elaboration of statistical data may not be enough to overcome this bias. By introducing a judgment orientation as a de-biasing technique, along with enhanced statistical data, significantly greater attention to the statistical data may be achieved.

Overview of the Study

In this study, I investigate whether the anecdotal data presented in PCAOB inspection reports for large firms overshadows the inclusion of statistical data, as presented in PCAOB reports of small firms. I also test the efficacy of two decision aids that the PCAOB could easily implement, which I designed to help incorporate statistical data into judgments. Prior decision making research suggests that anecdotal bias may be reduced by introducing visual enhancements to increase the vividness of statistical data, thereby increasing its chances of being assimilated into the decision (Fagerlin et al. 2005). Research in psychology, accounting and other fields also suggests that a person's judgment orientation, i.e., the approach taken to process certain forms of data, can impact the assimilation of statistical data in the decision making process (Zukier and Pepitone 1984; Dennis and Babrow 2005; Wainberg et al. 2010). As a result, I investigate the efficacy of incorporating these two decision aids in PCAOB reports to counteract any anecdotal biases observed.

The study asked managers and other professionals who qualify to serve on audit committees to make an auditor engagement decision after reviewing inspection reports for two audit firms. I examined five different conditions in a between-subjects design. In one condition, participants received inspection reports as now presented by the PCAOB for large audit firms. In another condition, participants evaluated the inspection reports as presented for small firms. A third condition received only statistical data, providing a benchmark for measuring the relative influence of that data alone. Finally, two conditions evaluated possible decision aids to help assimilate statistical data into the decision. One

condition tested the efficacy of visually enhancing the statistical data, while the other added a statistical judgment orientation.

Preview of the Results

My results indicate that the current reporting of anecdotal data by the PCAOB can lead to incorrect perceptions of audit firms. In addition, the statistical information provided by the PCAOB in small firm reports is ineffective. That is, users continue to focus on anecdotal data in the presence of statistical data, as now presented in small firm reports. Finally, I found that participants were more likely to incorporate the implications of statistical data when a vividness enhancement of the statistical data and a statistical judgment orientation were introduced. These findings suggest that anecdotal biases in the PCAOB inspection reports can be effectively mitigated by employing these easily implemented decision aids.

CHAPTER 2

LITERATURE REVIEW

In this chapter I review the current literature relating to the PCAOB inspection reports and their relative importance in influencing audit committee engagement and retention decisions. I then review the studies which provide evidence for anecdotal biases that lead to either ignoring or underweighting of statistical data in decisions. Finally, I review the handful of studies that have investigated decision aids for countering these anecdotal biases.

The PCAOB and the Regulatory Environment

The Public Company Accounting Oversight Board (PCAOB) was enacted as part of the sweeping regulatory reforms in the Sarbanes-Oxley Act of 2002 (SOX). Section 101 of the Act created the PCAOB to provide an independent oversight of the audit industry, making clear its directive "to oversee the audit of public companies that are subject to the securities laws, and related matters, in order to protect the interests of investors and further the public interest in the preparation of informative, accurate, and independent audit reports for companies" (SOX 2002, 750).

Prior to Sarbanes-Oxley and the PCAOB, the audit industry had self-regulated by using the AICPA Peer Review process to report on audit firm quality. The Peer Review's inherent lack of independence was blamed for not providing the vigorous oversight necessary for detecting and preventing numerous high profile accounting scandals in the late 1990's and early 2000's. One need only look to the massive failures of Enron, Tyco, Worldcom and others to understand how ineffective self-regulation had been.

However, even with all its faults, Peer Review did provide at least some measure of relative audit quality that could be used by audit committees, boards of directors, and shareholders (e.g., see Hilary and Lennox 2005). With the passage of SOX, the Peer Review process was effectively supplanted by PCAOB inspection reports.

PCAOB disclaimers warn against using their reports to infer audit quality. However, an unintended result of supplanting AICPA Peer Review is that PCAOB inspection reports have now effectively become the industry's de facto independent measure of auditor performance. PCAOB disclaimers are largely ignored by the financial press who often publicize the inspection report results, chastising the firms for poor audit performance. In addition, firms with relatively 'clean' inspection reports also ignore PCAOB disclaimers by using the reports as evidence of the high quality of services they provide (Whitehouse 2009). Whether the PCAOB likes it or not, the reports are being used as a measure of audit quality.

PCAOB Inspection Reports

The PCAOB currently issues two types of reports depending on whether a firm is designated as large or small.[7] The information content of the reports differ in that large firm reports provide detailed descriptions of deficiencies found, without providing the total number of audits the PCAOB inspected. This can have significant implications for perceptions of audit firm quality as users may only rely on the number of weaknesses listed without taking any statistical context into account.

[7] The PCAOB considers firms having more than 100 public clients to be large while all others are considered to be small.

In 2007, the U.S. Treasury established the Advisory Committee on the Auditing Profession to examine auditing industry concentration, its financial soundness, audit quality, and other topics (U.S. Department of the Treasury, 2007). The committee's 2008 report warned that within the current PCAOB regulatory environment, indicators of audit quality at individual auditing firms were lacking and that it was difficult to determine whether audit committees had the necessary tools for assessing audit quality. That is, the committee noted a lack of publicly available information that would contribute to making the initial auditor selection and subsequent auditor retention evaluation process more informed and meaningful. While this assessment may not have been directed specifically at the PCAOB inspection reports themselves, it did reflect a general sentiment that the PCAOB inspection reports weren't the scorecards of auditing expertise that the public had hoped for (Whitehouse 2009).

The committee's final report goes on to recommend that "the PCAOB, in consultation with auditors, investors , public companies, audit committees, boards of directors, academics, and others determine the feasibility of developing key indicators of audit quality and effectiveness and requiring auditing firms to publicly disclose these indicators" (VIII:15). They note that such indicators of audit quality are currently being disclosed in the UK and Europe since the inception of the Transparency reports as required by the EU's Directive 8 (PCAOB SAG 2008).

Professional Oversight Board

In the UK, the Professional Oversight Board (POB) provides regulatory oversight of the UK audit industry. The Audit Inspection Unit (AIU) is the arm of the POB that

monitors the audits of all listed and major public interest entities. The AIU is somewhat similar to the PCAOB in that it inspects the audit firms and makes public the results of those inspections. One noted difference is that, while the AIU reports on deficiencies uncovered in the inspection, it also provides an overall opinion on the audit practices of the firm being inspected (somewhat similar to the AICPA Peer Review reports), as well as provides underlying statistical information regarding the scope of the inspection (i.e., the number of a firm's audits inspected by the AIU). As evidenced in their report on the 2008 Standing Advisory Group meeting, the PCAOB is considering some of the reporting methods of the AIU for possible adoption. Adding statistics to the reports could be one possible way to improve them.

Audit Firm Reaction

The PCAOB provides audit firms an opportunity to respond to the content of their inspection report prior to its publishing in the form of response letters. The firm responses are then attached to the back of the publicly available inspection report itself. The response letters provide evidence that some firms are aware of the lack of statistical context in the PCAOB inspection reports and its potential implications. For example, BDO Seidman (2008, 1) has complained numerous times in their response letters that the "design of the draft Report does not provide a comprehensive description of the procedures that were performed… or other information that may provide additional context for understanding the nature or frequency of the findings." Needless to say, audit firms view PCAOB inspection reports as potential threats to their reputations, and have noted and complained about the lack of statistical context. However, as discussed in the

next section, adding statistical data alone may not solve the problem of lack of statistical context.

Stories vs. Statistics

There is a growing body of literature in psychology, communications, medical decision making, and more recently accounting, suggesting that people are generally better at assimilating stories than they are statistics (Kida 2006; Zillmann 1999; Hamill et al. 1980; Borgida and Nisbett 1977; Green et al. 2001; Fagerlin et al. 2005; deWit et al. 2008; Kazoleas 1993). That is, we as humans appear to be 'hard-wired' to making inductive generalizations about the world by taking single accounts (i.e. stories, anecdotes, testimonials) and extrapolating these to the population as a whole.

Landau (1984) ascribes this predilection for processing stories as being rooted in our social and cognitive evolution. She argues that scientists, in general, have failed to recognize the extent to which narrative structures shape and define their thinking and communication of ideas. Story-telling is ubiquitous to human culture and narrative traditions can be traced back to the very root of human history. Traditional forms of human knowledge and wisdom have typically been passed down from one generation to the next by way of narrative, or other story-telling vehicle. Kida (2006) explains that the consequence of this is an inherent human "penchant to pay close attention to information that comes to us in the form of a story or personal account."

Hamill, Wilson, and Nisbett (1980) investigated the extent to which people make inductive generalizations to a population based on a single anecdote, even after being warned that it was atypical of the population as a whole. They had 127 participants read a description of an irresponsible woman who had been on welfare for many years.

Participants in one condition were told that this was a typical representation of a welfare recipient and provided statistics to corroborate this claim. The statistics reported that the average length of stay for a welfare recipient was 15 yrs and that 90% were still on the rolls after eight years.

Participants in a second condition were warned that the depiction of the irresponsible woman was not typical and were provided statistical data that was more positive and conflicted with that depiction. These statistics disconfirmed the exemplar and reported that the average stay on welfare was two years and that 90% were off the rolls by four years. A control condition provided a baseline for *a priori* beliefs relating to the subject matter. After reviewing the materials, participants were asked to answer seven Likert-type scale questions meant to assess their attitudes toward welfare recipients. Their results indicated that participants in the atypical condition failed to assimilate the more positive statistical information into their judgments as inferences made to the general population of welfare recipients failed to differ between the two experimental conditions ($t = 0.44$, $p > 0.25$). Participants in the control condition held a more favorable view of welfare participants than the atypical condition ($t = 2.50$, $p < 0.05$), even though their uninformed beliefs were generally more negative.[8]

In a second experiment, Hamill et al. (1980) had 147 participants watch a videotaped interview of a prison guard that appeared to be either humane or inhumane. Participants in the first two conditions were either told that the interview was typical or

[8] Participants in the control condition guessed that the average length of stay on welfare was 10 years and that the required length of time required to remove 90% of recipients from the rolls was 21 yrs.

atypical of prison guards in general.[9] Participants in a control condition were not given any information as to the typicality of the representation. After watching the video interview, participants were asked four questions relating to the dependent measure. Their results indicated that they were markedly influenced by the characteristic of the guard in the video. The humaneness of the guard accounted for 26.4% ($F = 38.43$, $p<0.001$) of the total variance while the sampling information accounting for only 1.2% of the variance ($F < 1$, *ns*).[10]

Borgida and Nisbett (1977) examined the effect that testimonials can have on people's choices. In their study, undergraduate student participants were asked to indicate their intention to take courses after being exposed to either statistical data (representing summarized course evaluations on a five-point scale from a larger student body) or face-to-face testimonials (in the form of a panel of upper level students), where the course was rated by two or three students on the panel using the same five-point scale. Their results suggest that the vividness of the face-to-face testimonials were a more powerful influence on students' subsequent intention to take courses than the summary statistical data.

In a medical treatment decision task, Fagerlin, Wang and Ubel (2005) asked participants to choose between two treatments for angina - balloon angioplasty and bypass surgery. Participants were provided with a brief description of the effects of angina (e.g., tightness in chest and difficulty performing everyday chores), along with details about the two types of treatment available. Statistical data relating to the success rate of each type of treatment were provided. In addition to the statistical data,

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[9] The prison guard in this conditions was described as either being "one of the best" (humane) or "one of the worst" (inhumane).
[10] The authors do not provide exact F or *p* values for that analysis.

testimonials were provided that were either consistent or inconsistent with the statistical information (i.e., the patient testimonials described how the procedure had helped or didn't help their condition). Their results suggest that the testimonials had a significant influence on a participant's preference for bypass surgery over balloon angioplasty, with 41% choosing bypass when the anecdotes were representative of the statistics, versus only 20% when the testimonials were not ($\chi^2 = 14.4$, $p < 0.001$).

In another recent medical study, de Wit, Das and Vet (2008) examined whether objective statistical information or personal testimonial was more effective in the transmission and acceptance of a health risk communication. The majority of the 118 participants in the study identified themselves as homosexual (86.4%) and warranted inclusion in the study as an at-risk population for HBV (Hepatitis-B). Participants provided with statistical information were told that the number of chronic HBV infections had increased by 80% in recent years and that 30% of those infected were homosexual men who comprise only approximately 5% of the general population (indicating the highest risk for that group). Participants in the narrative condition were provided with a personal testimonial of a homosexual male who had resisted vaccination for HBV and subsequently become infected. Each condition ended with a message stating that vaccination was effective in providing long-term protection from HBV. Their results indicate that both the perceived risk of infection as well as an intention to obtain vaccination was highest among men who received the narrative vs. statistical data.[11]

[11] While significant overall ANOVA statistics are provided by the authors (two control groups were included in the study), specific *t*-test results are not provided and are only mentioned in the text as being significant.

In a recent working paper, Wainberg, Kida and Smith (2010) conducted two experiments in two different accounting contexts (i.e., managerial accounting and auditing) to investigate whether accounting decision makers were unduly influenced by anecdotal data in the presence of superior, and contradictory, statistical data. In their first experiment, they had 92 practicing managers and other individuals with significant business experience engage in a capital budgeting investment task. Participants were asked to make an investment choice between three machines for a manufacturing production line. All were provided with statistical data relating to each machine's reliability rating and economic cost of operation. They were informed that these statistics were from a trusted source and represented hundreds of observation points collected from managers in the industry having had first-hand experience with the equipment. Participants receiving an anecdote read about a single bad experience with the top-rated choice. They were informed that this anecdotal experience had been captured in the aggregated statistical measure (thereby rendering it irrelevant). Participants exposed to the anecdote were more likely to make suboptimal investment choices (i.e., 58% of participants shunned the superior choice and elected to purchase equipment that was of inferior quality and more costly to operate) when compared to participants not exposed to the anecdote, where only 4% failed to choose the optimal investment ($\chi^2 = 16.285$, $p < 0.001$).

In their second experiment, Wainberg et al. (2010) tested for the existence of anecdotal biases in an audit setting. Fifty-five entry-level auditors were provided with hypothetical audit case materials and asked to perform an analytical review and make a resource allocation decision based on that review. The financial statements (i.e.,

statistical data) provided to the auditors indicated that the accrued warranty liability and related expense accounts had experienced a significant, yet unexplained, income-increasing fluctuation when compared to the previous year.

In one condition, auditors were provided with two anecdotes in addition to the statistics. The anecdotes were designed to direct attention away from the account with the large fluctuation (i.e., accrued warranty liability) and toward the account that had relatively little fluctuation (i.e., accrued compensation liability). The first anecdote represented a financial news story that involved fraud at another company where executives had understated accrued compensation liability and expenses in order to meet analyst forecasts. The second anecdote, provided in the form of a consumer report article, provided a glowing assessment of the company's product reliability (which had remained unchanged for the last five years). This second anecdote was designed to provide an unwarranted level of comfort with the precipitous drop in expenses over the period. Consistent with prior research, their results indicated that auditors were unduly impressed by the anecdotal data and significantly underweighted the diagnostic value of the statistical data, as evidenced by their allocation of audit resources.

Summary

Overall, there is a growing body of literature in psychology, communications, medical decision making, and accounting that point to the existence and prevalence of anecdotal biases across wide range of decision making tasks. The PCAOB inspection reports for large firms are primarily anecdotal in nature, providing vividly detailed descriptions of deficiencies uncovered by the inspection teams without any statistical

context. However, including statistical data in the reports may not solve this problem. Based on the research previously discussed, users of the reports are likely to ignore or underweight those statistics, focusing primarily on the sheer number of anecdotes reported without taking into account the relative frequency with which they occur.

While many studies have successfully demonstrated the stories vs. statistics phenomenon, the underlying psychological mechanism causing our preference for stories over statistics is an open question. As mentioned previously, this preference could be attributed to our social and cognitive evolution. That is, our predisposition for the narrative format may be a result of our ancestral heritage of passing along information in that form. In addition, dual process theories of reasoning and transportation theory have been advanced as possible explanations as well. These are discussed in the following section.

Dual Process-Theories of Reasoning

A number of recent studies have suggested the use of dual process theories of reasoning and transportation theory as descriptive models to provide a theoretical explanation for these observed effects (Hinyard and Kreuter 2007; Berger 2007; Green and Brock 2000; Green et al. 2002; Knowles and Linn 2004; Limon and Kazoleas 2004).

The dual process theory of reasoning refers to a substantial and growing body of literature in psychology proposing that individuals use two distinct cognitive systems to process information. Philosophers and psychologists have long debated the existence of these dual systems with references being made to it dating back into antiquity (Sloman 1996; Epstein 1994; Evans 2003). The duality of reasoning expressed in these theories can be commonly observed in everyday life and are often expressed in what laymen

would term 'head' vs. 'heart' decision choices.[12] Brain imaging studies using fMRI technology support the existence of these separate systems with different areas of the brain being active in the performance of certain types of cognitive reasoning tasks (Goel 2003; Evans 2003). If differing types or forms of evidentiary matter have the potential to differentially engage these two systems of processing, then biased decision choices could occur.

Stanovich and West (2000) provide a comprehensive review of these dual process theories, applying the generic labels of System 1 and System 2 in place of the more descriptive terms often used. System 1 refers to cognition that can be characterized as intuitive, rapid, and effortless, consistent with the constructs of automaticity and heuristic processing. System 2 refers to the deliberative processing of analytical intelligence. System 2 is often described as slower, more controlled, rule-based form of cognitive processing.

According to the dual process model, System 1 and System 2, though separate, operate jointly to affect decision choices with task variables influencing the degree to which a decision maker will rely on each of those system's outputs. The effect of each system on a given decision choice will depend largely on where the decision maker stands on that System 1 – System 2 processing continuum (i.e., the level of System 2 engagement).

[12] The terms most often used in psychology to express this cognitive duality include intuitive vs. analytical, implicit vs. explicit, experiential vs. rational, heuristic vs. analytic, tacit vs. explicit, and cognitive vs. experiential. While many of the technical properties of these dual-process systems do not match precisely, their underlying constructs bear familiar resemblances (Stanovich and West 2000).

Epstein et.al., (1992) propose that stories (i.e., narratives, anecdotes) are appealing to System1 because they tend to be emotionally engaging and represent events and situations that are quite similar to those experienced in real life, whereas statistical data is least often integrated in our daily lives. Being rich in anecdotal detail, the PCAOB inspection reports for large firms may appeal to, or engage more of, System 1 versus System 2 - type processing.

Transportation Theory

Transportation theory (Green and Brock 2000) provides yet another possible explanation for the existence of these narrative or anecdotal biases. Transportation theory posits that a powerfully persuasive factor of the narrative, or story, format is its ability to 'transport' the reader into another frame of reference.

Transportation theory holds that a story's ability to 'transport' an individual into the narration can significantly reduce counterarguments which can lead to a greater acceptance of an argument's message. For example, Limon and Kazoleas (2004) find that participants exposed to messages supported by anecdotes generated fewer counterarguments and produced a lower number of cognitive responses than those exposed to messages supported by statistics only.

Transportation theory also posits that 'transportation' into the narrative can have the effect of making the message seem like a direct experience. Since direct experiences can have a powerful effect on the formation of attitudes and beliefs, evidence capable of eliciting that type of processing can be formidably persuasive (Fazio and Zanna 1981; Zillman and Brosius 2000).

Decision Aids

A small number of decision aids have been examined for de-biasing decision maker judgments where anecdotal biases have been found. Three decision aids in particular have proven successful in this regard – judgment orientation, enhanced statistical presentation, and counterargument. The present study investigates the efficacy of the first two decision aids in de-biasing judgments made using anecdote-laden PCAOB inspection reports. The literature concerning the two decision aids examined are discussed.

Judgment Orientation

Judgment orientation has been used as a de-biasing aid in a handful of studies. Judgment orientation typically refers to how the contextual features of a decision can influence a decision maker's conception of a task, the kinds of evidence considered, and the specific cognitive strategies employed (Zukier 1984; Zukier and Pepitone 1984). That is, the relative weights placed on differing types of information in a decision task can be largely defined by the orientation taken by the decision maker. As a consequence, Zukier and Pepitone (1984) argue that information considered important in one orientation may be ignored or underweighted in another.

Zukier and Pepitone (1984) examined the effect of taking a 'scientific' or 'clinical' orientation on base rate utilization in Kahneman and Tversky's (1973) classic engineer-lawyer problem. In that Kahneman and Tversky problem, participants were told that an individual had been randomly selected from a pool of 100 professionals – either 70 lawyers and 30 engineers or 30 lawyers and 70 engineers. The individual is described

as being conservative, careful, and interested in math puzzles. While this description is made to purposefully sound like an engineer, thereby invoking the representativeness heuristic, it does not in any way preclude the individual from being a lawyer. Participants in these studies invariably fail to appropriately incorporate the statistical information in their likelihood assessments. In fact, even when an entirely neutral description is provided (i.e., the individual is of high ability, well respected), participant likelihood judgments center around 0.5, reflecting an overweighting of the uncertain neutral description and an underweighting of the statistical data.

In the Zukier and Pepitone (1984) study, participants were provided with a judgment orientation prior to their exposure to Kahneman and Tversky's problem. Participants given a 'scientific' orientation were told that the study had been sponsored by the 'Center for Research in Scientific Thinking' and that they were examining how much people will use scientific thinking in making decisions when provided with only a few pieces of information. They were further instructed to make their judgment as if they were scientists analyzing the data. Conversely, participants given a 'clinical' orientation were told that the study had been sponsored by the 'Center for Job Counselor Training' and told to call on their general knowledge, sensitivity, and empathy in making their assessment. The results indicated that participants provided with a 'scientific' orientation were more likely to incorporate the statistical data into their judgments.

In a more recent study of judgment orientation, Dennis and Babrow (2005) extended the judgment orientation literature into a medical decision task where participants were asked to assess the likelihood that a patient had an illness, rather than membership to a professional group. Their results were largely consistent with Zukier

and Pepitone (1984), whereas a 'scientific' judgment orientation was successful in drawing attention to the statistical data while a 'narrative' orientation had participants more focused on qualitative information.

Wainberg et al. (2010) examined whether or not a 'scientific' judgment orientation might help de-bias a manager's capital budgeting decisions. They tested two versions of their 'scientific' orientation; a stronger and weaker version. In both orientation conditions, participants were told prior to reading the case materials that the study had been sponsored by "The Center for Scientific Thinking in Management," and they were provided with a short explanation of what "scientific thinking" entailed (i.e., "a scientific thinker is one who very carefully considers the quality of each piece of information"). In the stronger orientation condition, this description of scientific thinking was enhanced with an additional description of how science progresses (i.e., "Progress in science is generally achieved via the deliberate process of obtaining quantifiable data through observation and/or experimentation"). Participants in both orientation conditions were told to analyzing the information in the way that a scientist would and then to 'think like a scientist' just prior to making their decision.

Their results indicated that the 'scientific' orientation was successful in directing attention to the statistical data. In the weaker orientation condition, 52 percent of participants made the optimal decision (i.e., the statistically superior choice) as compared to only 42 percent of participants in the non-orientation condition ($\chi^2 = 3.969$, $p = 0.069$). In addition, when the scientific judgment orientation manipulation was made stronger, 78 percent of the participants chose the statistically superior choice, which was significantly more than the participants in both the non-orientation ($\chi^2 = 5.784$, $p = 0.027$) and the

weaker 'scientific' orientation condition ($\chi^2 = 5.187$, $p = 0.038$) conditions. While the enhanced intervention did not completely eliminate the anecdotal bias, the results indicate that it was highly effective in reducing that bias.

As evidenced by the studies previously described, a judgment orientation can be helpful for focusing attention on specific elements of a decision.

Enhanced Statistical Presentation

Prior research by Fagerlin, Wang, and Ubel (2005) has found that the use of statistical data can also be increased by enhancing the vividness and presentation of the statistical information. Asking whether a picture was worth a thousand statistics, Fagerlin et al. (2005) replicated an earlier study that found an anecdotal bias in a medical decision and then utilized pictographs in order to enhance the delivery of statistical information. As previously described here in this review, the authors had asked participants to choose between two treatments for angina - balloon angioplasty and bypass surgery. Their results suggested that anecdotal data had a significant influence on participant's preference for bypass surgery over balloon angioplasty, with 41% choosing bypass when the anecdotes were representative of the statistics, versus only 20% when the anecdotes were not ($\chi^2 = 14.4$, $p < 0.001$). The authors found that decisions were considerably de-biased when a pictograph was introduced (see Figure 2.1) indicating the various success rates using the two treatments.

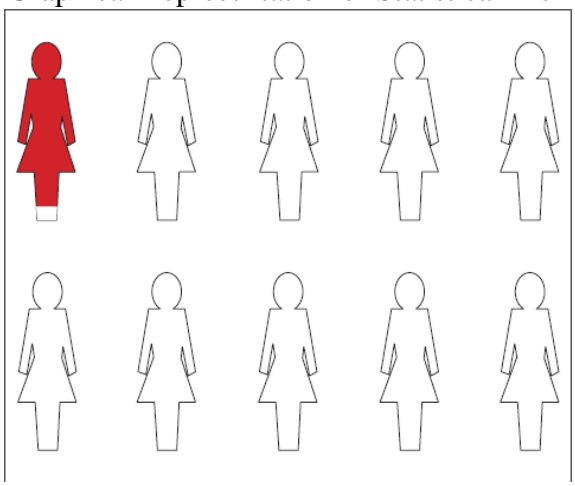
The pictograph in Figure 2.1 graphically illustrates that the success rate for curing angina is 50% using balloon angioplasty and 75% when bypass surgery is chosen. In their study, participants receiving the pictographic representation of the statistical data were

more likely to choose bypass surgery than participants receiving non-enhanced statistical information (40% vs. 27%, $\chi^2 = 6.44$, $p < 0.001$).

FIGURE 2.1
Pictograph of Statistical Data

In an earlier medical focus study, Schapira, Nattinger and McHorney (2001) found that participants responded best to frequency graphics that use human figures to highlight the risk of breast cancer. In the graphical representation of breast cancer risk presented in Figure 2.2, human figures add contextual meaning to the statistical information by illustrating a nine percent lifetime risk of contracting cancer. Schapira et al.'s (2001) focus group found this format to be easier to identify and more understandable than other forms of statistical representation.

FIGURE 2.2
Graphical Representation of Statistical Risk



Overall, the research suggests that vividness enhancements can be used to successfully improve the chances that statistical data are assimilated into judgments being made.

Summary

The PCAOB inspection reports are an important tool for reporting on the audit quality of both large and small firms. While preliminary results have been mixed as to whether the market uses these reports to make auditor engagement and retention decisions, the report findings are being used both in the general press, and by the accounting firms themselves. The reports for large firms contain only anecdotal lists of deficiencies found without any statistical context for understanding the magnitude of the deficiencies uncovered. This lack of statistical context can lead to incorrect perceptions of audit firm quality. Simply providing statistics, as found in the reports for small firms, may not provide a solution to this problem. As discussed in this section, there is a considerable amount of research indicating that anecdotal biases are likely to overwhelm the inclusion of statistical information. However, prior research has found that decision aids, such as judgment orientation and vividness enhancement, can be successfully

employed to mitigate this bias by focusing attention away from the anecdotal data and onto statistical data.

CHAPTER 3

METHODOLOGY

The primary purpose of this study is to examine whether the lack of statistical context in large firm reports can lead to incorrect perceptions of audit firms and whether the inclusion of statistical context will be overshadowed by the anecdotal deficiencies listed in the reports as the result of an anecdotal bias. The experiment concerned having participants make an audit engagement decision between two firms after reviewing PCAOB-likened inspection reports for each firm.

The study manipulated the number of deficiencies reported in each inspection report so that one firm would be preferable over the other when no statistical context was provided. That is, preference would naturally favor the firm with the fewest deficiencies, *ceteris paribus*. The addition of statistical data was intended to switch preference from the firm with the fewest number of deficiencies in total to the firm with the fewest *scaled* deficiencies per audit. That is, consideration of the statistical implications would favor the firm having the highest number of deficiencies in total, but with the lowest percentage of deficiencies per audit inspected, *ceteris paribus*.

Finally, the experiment also investigated the efficacy of using two decision aids, judgment orientation and a vividness enhancement, for overcoming any anecdotal biases identified.

Hypotheses

The PCAOB currently uses two different reporting styles for large and small firms. Large firm reports contain vivid, detailed descriptions of deficiencies found, without providing any statistical context for assessing the relative frequency of those

deficiencies (e.g., the total number of audits the PCAOB inspected). This can have significant implications for perceptions of audit firm quality if users only rely on the number of weaknesses listed without taking any statistical context into account.

To determine whether this is a potential problem, I reviewed all of the PCAOB inspection reports for small firms between August 2004 and May 2009, for which the PCAOB *does* provide information on the number of audits inspected. My results, reported in Table 3.1, illustrate the potential problem.[13] As can be seen, the range of audits inspected for each number of deficiencies found can vary widely. For example, a firm receiving four deficiencies in its inspection report may have had as many as thirteen audits inspected by the PCAOB (i.e., 0.31 deficiencies per audit inspected) or as few as one audit inspected (i.e., 4.0 deficiencies per audit). Focusing on anecdotal information alone (as large firm PCAOB inspection reports do) can potentially lead to incorrect impressions of a firm. That is, without statistical information, users of the reports have no basis for assessing the relative frequency of the firm's audit deficiencies.

Hypothesis 1

It would appear that a simple solution to the problem of context deficiency would be to provide statistical information in the reports of large firms, as is currently presented in small firm reports. However, this alone may not solve the problem. As discussed in the literature review section of this paper, prior research suggests that statistical evidence is often ignored and/or underweighted in the presence of less informative anecdotal data. In addition, anecdotal biases are likely to be exacerbated by the fact that the statistical

[13] The table only includes inspection reports for small firms because no information about the number of audits inspected is provided in the reports of large firms.

information provided in small firm reports is embedded in the boilerplate text preceding the anecdotal deficiencies, making it easily overlooked.[14]

TABLE 3.1
Descriptive Statistics from 793 PCAOB Small Firm Inspection Reports*

Number of Deficiencies	Range of Audits Inspected		Number of Deficiencies per Audit Inspected	
	Min	Max	Min	Max
0	1	16	n/a	n/a
1	1	10	0.10	1.00
2	1	11	0.18	2.00
3	1	10	0.30	3.00
4	1	13	0.31	4.00
5	2	9	0.56	2.50
6	2	9	0.67	3.00
7	2	8	0.88	3.50
8	1	13	0.62	8.00
9	2	12	0.75	4.50
10	4	14	0.71	2.50
11 or more**	3	9	1.33	3.67

* I collected data from all available PCAOB inspection reports from August 2004 through May 2009. I only present the data from small firm reports because no scope information is available for large firms. The number of deficiencies found refers to the total number of deficiencies reported in the inspection report of a given firm. The range of audits inspected provides the scope of the inspection team's audit, which can vary widely. For example, a firm having four deficiencies may have had as many as thirteen, or as few as one, audit inspected. The number of deficiencies per audit is the number of deficiencies divided by the number of audits inspected.
** 99% of the inspection reports of small firms have 10 or fewer deficiencies.

[14] For example, the following standard introduction was taken from a random small firm report: "The inspection procedures included a review of aspects of the Firm's auditing of financial statements of six issuers….The deficiencies identified in three of the audits reviewed included deficiencies of such significance that it appeared to the inspection team that the Firm did not obtain sufficient competent evidential matter to support its opinion on the issuers financial statements" (PCAOB Release no. 104-2008-097, 5).

As a result, the statistics may still be overlooked if attention is not drawn to them. This could have significant implications for assessing firm weaknesses, possibly leading to misperceptions of firm audit quality. That is, firms that have the greatest absolute number of weaknesses reported, without taking into account the size of the sample taken, could be viewed more negatively than firms having fewer deficiencies, but with a higher ratio of deficiencies per audit.

Given the preceding discussion and results of prior research, I test the following hypothesis:

> H1*: Participants given inspection reports containing anecdotal lists of deficiencies and statistical data, as currently presented in PCAOB reports of small firms, will make decisions consistent with having ignored, or underweighted, the implications of the statistical data, resulting in decisions that are no different from those using inspection reports that just list anecdotal data, as presented in large firm reports.*

Hypothesis 2

As previously discussed, prior research has found that the use of statistical data can be increased by enhancing the vividness and presentation of the statistical information. If the presentation of statistical data in PCAOB small firm reports are pallid when compared to the vividness of anecdotal accounts of deficiencies noted, then elaboration and enhancement of the statistical data may be able to increase its salience. For example, a PCAOB report listing four deficiencies found at ten clients inspected could be elaborated on to highlight those areas where, in fact, no deficiencies were found (i.e., six out of the ten clients had no deficiencies). Also, enhancing the vividness of the statistical data could be achieved by placing it into a table along with the elaborations

discussed, thereby increasing its chances of being attended to. As a result, I test the following hypothesis:

H2: *Participants given inspection reports containing an anecdotal list of deficiencies and enhanced statistical data will make decisions consistent with a greater utilization of statistical data than participants receiving an anecdotal list of deficiencies only, as presented in PCAOB reports of large firms, and an anecdotal list of deficiencies and statistical data, as presented in PCAOB reports of small firms.*

Hypothesis 3

As discussed previously, we do not appear be 'hard-wired' to attend to statistical data. If users of PCAOB inspection reports are biased towards processing anecdotal data, then an enhancement and elaboration of the statistical data, as theorized in Hypothesis 2, may not be enough to overcome this bias. I propose introducing a judgment orientation as a debiasing technique, in addition to the enhanced statistical data. As a result, I test the following hypothesis:

H3: *Participants given a judgment orientation promoting attention to statistical data, in addition to the anecdotal list of deficiencies and enhanced statistical data, will make decisions consistent with a greater utilization of statistical data than participants receiving an anecdotal list of deficiencies only, as presented in PCAOB reports of large firms, an anecdotal list of deficiencies and statistical data, as presented in PCAOB reports of small firms, and anecdotal lists of deficiencies and enhanced statistical data.*

Method

Participants

Participants were 207 managers and other professionals who qualify to serve on audit committees. Responses were obtained while they attended a professional management training program. The participants included individuals from upper level

management (e.g., corporate director, president, chief operating officer), middle level management (e.g., operations manager, product manager, senior finance manager), and others with significant professional experience (e.g., controller, financial analyst, senior internal auditor). On average, participants had nine years of business experience.[15] The participants' backgrounds qualify them to serve on boards of directors and audit committees of many companies across a range of industries, and therefore influence auditor selection and retention decisions (SEC 2003; Hoitash et al. 2009; Kesner 1988).[16]

Overview of the Study

The instrument was administered online using Qualtrics® research software. Participants were asked to assume the role of an audit committee member and to make a hiring decision between two audit firms that were being considered to perform the company's year-end audit. The two firms under consideration were described as being identical with respect to size and historical reputation. Participants were told that they had obtained the publicly available annual inspection reports from the (PCAOB-likened) Federal Public Auditor Regulatory Board (FPARB) whose job it was to "audit the

[15] Fiolleau et al. (2009) found that managers influence auditor selection decisions. Of our 207 participants, 152 were experienced managers. I ran all of the analyses using only managers and found similar results that yielded the same conclusions as those reported with all participants included (please see the additional analyses section for a more complete analysis of that sub-group's responses). In addition, I found no significant effects due to the level of business experience.

[16] The SEC (2003) requires that only one member of the audit committee have financial expertise, which the SEC broadly defines as having an understanding of financial reporting and internal controls, but explicitly *not* necessarily requiring financial or supervisory experience (i.e., financial experts need not be CEOs, CFOs, CPAs, etc.). The remaining members of the audit committee need not even meet the 'understanding' requirement. In fact, Hoitash et al. (2009) report that a full 79% of audit committee members, in their sample of public companies, were not financial accounting experts. Consistent with this finding, we conducted a review of audit committees of public companies and found a wide range of professional backgrounds. For example, audit committee members include managers, lawyers, physicians, engineers and other professionals across a variety of industries.

auditors."[17] Consistent with PCAOB inspection reports, I provided a description of the inspection process which indicated that the number of audits inspected was left to the discretion of each inspection team, and that the number tended to vary widely between firms. The order of the two firms was counterbalanced to ensure no order effects.

The reports contained audit deficiencies taken from actual PCAOB inspection reports. I designed the experiment so that the inspection report of Audit Firm A included three deficiencies discovered over two audits inspected, while the report for Audit Firm B included six deficiencies discovered over twelve audits inspected.[18] I did this so that the number of anecdotes would favor Firm A (i.e., three vs. six audit deficiencies), while placing these anecdotes in statistical context would favor Firm B (i.e., 1.5 deficiencies per audit inspected for Firm A vs. 0.5 deficiencies per audit inspected for Firm B). This design feature provided me with a benchmark of participant attention to the statistical or anecdotal data. To ensure that the audit deficiencies were equally severe, I adapted fifty audit deficiencies from actual PCAOB inspection reports that I considered to be of moderate severity, and pre-tested them on sixty Master's of Accounting students who rated their significance to audit quality on a scale of one to seven. From these, I selected nine deficiencies for inclusion in the experiment that had no significant differences in severity ($F=0.446$, $p=0.893$).

[17] While the PCAOB allows use of its reports for a variety of purposes, it does not allow the use of its name if the reports are altered in any way, and so we use the name Federal Public Auditor Regulatory Board (FPARB).

[18] I used the labels 'Audit Firm ABC' and 'Audit Firm XYZ' in the actual instrument. These labels were counterbalanced to ensure that no preference for firm name would affect the results. I provide the generic terms of 'Firm A' and 'Firm B' in the paper for ease of exposition.

Experimental Design

Participants were randomly assigned to one of five experimental conditions: *anecdotes only (PCAOB–L), statistics only, anecdotes & statistics (PCAOB–S), anecdotes & statistics–enhanced,* and *anecdotes & statistics–judgment orientation.*

The *anecdotes only (PCAOB–L)* condition provided reports with only detailed anecdotal information about each audit deficiency without any statistical context, as currently presented in the PCAOB reports for large audit firms (see Appendix). The *statistics only* condition did not provide detailed anecdotal information about each deficiency, but rather provided statistical data relative to the inspection (see Appendix). The data was presented in a table which gave the total number of clients inspected, the total number of clients where deficiencies were found, the total number of deficiencies found, the average number of deficiencies per client inspected, the ratio and percentage of clients with deficiencies to all clients inspected, and the ratio and percentage of clients without deficiencies to all clients inspected. In addition, the reports included the audit area where the deficiencies were found (e.g., inventory, loan loss reserves, discontinued operations; see Appendix). These two conditions provide a benchmark that indicates the judgments made when only anecdotal or statistical data are provided. As such, they can be used to compare the incremental effect of the remaining three conditions that provide both anecdotal and statistical data.

The *anecdotes & statistics (PCAOB–S)* condition presents the anecdotes exactly as in the anecdotes only condition, plus the statistical information in boilerplate language as currently presented by the PCAOB in its inspection reports for small audit firms (i.e., "PCAOB−S"). That is, users were told how many clients were inspected, how many deficiencies were found, and how many clients had deficiencies (see Appendix). As a result, all of the underlying statistical information in the statistics-only condition (e.g., the ratio of deficiencies per audit inspected, the number of audits with no deficiencies, the number of deficiencies on each audit) were *implicitly* available to participants in this

condition, although it was not explicitly presented since it is only implicit in the PCAOB inspection reports for small firms.

The *anecdotes & statistics–enhanced* condition was a combination of the *anecdotes only (PCAOB–L)* and *statistics only* conditions. The statistics were presented in a table as given in the Appendix. The anecdotes were placed in a second table, providing the same anecdotal information as given in the *anecdotes only (PCAOB–L)* condition (see Appendix). In this table, I placed the name of the client in the left column, the number of deficiencies uncovered at that client in the middle column, and the full anecdote in the right column. While the anecdotes provided were identical to those in the *anecdotes only (PCAOB–L)* condition, the table explicitly listed those clients where no deficiencies were found. This feature was added to reinforce the implications of the statistical data showing that, while deficiencies may have been found, certain client audits were, in fact, deficiency-free.

Finally, the *anecdotes & statistics–judgment orientation* condition provided participants with audit firm reports that were identical to the *anecdotes & statistics–enhanced* condition, except that an introduction was added to the beginning of each report reminding users that the scope of the inspections could vary widely between firms and that the sample size taken by the inspection team was not necessarily related to firm size or historical reputation for audit quality. The reports also had a disclaimer urging participants to appropriately consider the number of clients inspected in addition to the number of deficiencies found when making comparisons. This was done to focus attention on the statistical data so that the anecdotal data was put in its statistical context.

After reviewing the materials, participants were asked to make a choice between the two audit firms and indicate whether they held a slight, moderate, or strong preference for that choice. In addition to this primary dependent variable, I requested that participants answer two exploratory questions (i.e., I had no a priori reason to expect that assignment to the various conditions would affect participant responses). The first

question asked how credible they believed the audit profession to be today on a seven point Likert-type scale ranging from not very credible to very credible. The second question captured how effective they believed the Sarbanes-Oxley Act of 2002 has been in uncovering and/or preventing audit failures in the last five years (on a similar seven point Likert-type scale ranging from very ineffective to very effective). I also collected data on years of business experience, management or supervisory experience, age, and gender.

CHAPTER 4

DATA ANALYSIS

This chapter presents an analysis of the data gathered. The results from my experimental analysis are presented in Table 4.1 and are represented graphically in Figure 4.1. Since audit committees ultimately have to choose which audit firm to employ, the choice of firm A or B is my dependent variable of interest. I first examined whether the purely anecdotal versus purely statistical data sets resulted in participants choosing different audit firms. That is, did those in the *anecdotes only (PCAOB–L)* condition choose Firm A (i.e., the firm with fewer total deficiencies), and did those in the *statistics only* condition choose Firm B (i.e., the firm with the fewest deficiencies per audit)? These served as the benchmark for my analyses of the relative level of attention paid to anecdotal versus statistical data in the other experimental conditions. As expected, the results show that 68.2% (31.8%) of participants in the *anecdotes only (PCAOB–L)* condition selected Firm A (Firm B) while 17.9% (82.1%) of participants chose Firm A (Firm B) in the *statistics only* condition (χ^2= 21.12, p<0.001).

Test of Hypothesis 1 Results

I tested Hypothesis 1 by analyzing the extent to which the decisions in the *anecdotes & statistics (PCAOB–S)* condition differed from the decisions in the *anecdotes only (PCAOB–L)* condition. The results are consistent with Hypothesis 1, as 66.7% (33.3%) of participants in the *anecdotes & statistics (PCAOB–S)* condition selected Firm A (Firm B) as compared to 68.2% (31.8%) of participants in the *anecdotes only (PCAOB–L)* condition (χ^2= 0.02, p=0.883).

TABLE 4.1
Participants' Auditor Selection Decisions

Panel A: Percent Choosing Firm Consistent with Anecdotal Data or Statistical Data

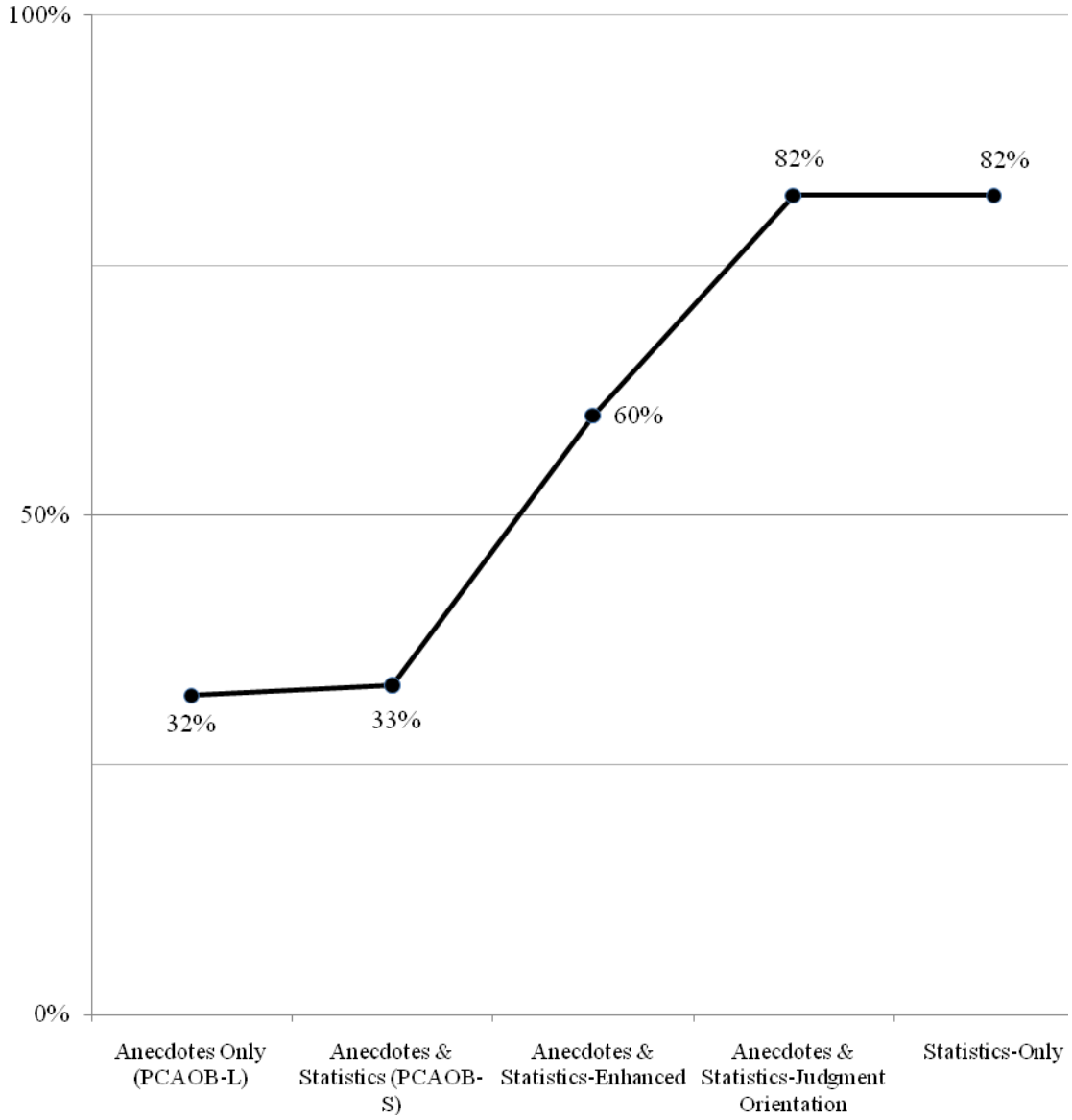
Condition	Anecdotes Consistent[a]	Statistics Consistent[b]	*n*[c]
Anecdotes Only (PCAOB−L)	68.2%	31.8%	44
Anecdotes & Statistics (PCAOB−S)	66.7%	33.3%	39
Anecdotes & Statistics−Enhanced	40.0%	60.0%	40
Anecdotes & Statistics−Judgment Orientation	17.8%	82.2%	45
Statistics Only	17.9%	82.1%	39

Panel B: Planned Contrasts

Contrast	Hypothesis	χ^2	*p*-value[d]
Anecdotes & Statistics (PCAOB−S)			
vs. Anecdotes Only (PCAOB−L)	H1	0.02	0.883
Anecdotes & Statistics−Enhanced			
vs. Anecdotes Only (PCAOB−L)	H2	6.72	0.005
vs. Anecdotes & Statistics (PCAOB−S)	H2	5.64	0.009
Anecdotes & Statistics−Judgment Orientation			
vs. Anecdotes Only (PCAOB−L)	H3	23.10	< 0.001
vs. Anecdotes & Statistics (PCAOB−S)	H3	20.23	< 0.001
vs. Anecdotes & Statistics−Enhanced	H3	5.16	0.012
Statistics Only			
vs. Anecdotes Only (PCAOB−L)		21.12	< 0.001
vs. Anecdotes & Statistics (PCAOB−S)		18.96	< 0.001
vs. Anecdotes & Statistics−Enhanced		4.65	0.031
vs. Anecdotes & Statistics−Judgment Orientation		0.00	0.984

[a] Choices consistent with the implications of the anecdotal data (i.e., the firm having the fewest number of deficiencies in total).
[b] Choices consistent with the implications of the statistical data (i.e., the firm having the fewest number of deficiencies per audit inspected).
[c] Cell size differences are a result of the software generated random assignment of participants to treatment conditions.
[d] Consistent with the hypotheses, our tests for H1 are two-tailed while tests for H2 & H3 are one-tailed. The remaining tests are all two-tailed.
In the *Anecdotes Only (PCAOB−L)* condition, participants received inspection reports containing deficiencies only, as provided in the current PCAOB reports of large audit firms. In the *Statistics Only* condition, participants received inspection reports having visually enhanced and elaborated statistical information along with a listing of areas where deficiencies were found (i.e. inventory, loan loss reserves, revenue recognition). These conditions provided a benchmark for assessing participant attention to anecdotal and statistical data. In the *Anecdotes & Statistics (PCAOB−S)* condition, participants received inspection reports containing both deficiencies and statistical information as provided in the PCAOB reports of small audit firms. The *Anecdotes & Statistics-Enhanced* condition received reports that were a combination of the *Anecdotes Only (PCAOB−L)* and the S*tatistics Only* conditions. The *Anecdotes & Statistics-Judgment Orientation* condition received the same information as the *Anecdotes & Statistics-Enhanced* condition with an added manipulation drawing attention to the statistical portion of the reports.

FIGURE 4.1
Percent of Participants Choosing the Audit Firm
Consistent with the Implications of the Statistical Data



In the *Anecdotes Only (PCAOB−L)* condition, participants received inspection reports containing deficiencies only, as provided in the current PCAOB reports of large audit firms. In the *Statistics Only* condition, participants received inspection reports having visually enhanced and elaborated statistical information along with a listing of areas where deficiencies were found (i.e. inventory, loan loss reserves, revenue recognition). These conditions provided a benchmark for assessing participant attention to anecdotal and statistical data. In the *Anecdotes & Statistics (PCAOB−S)* condition, participants received inspection reports containing both deficiencies and statistical information as provided in the PCAOB reports of small audit firms. The *Anecdotes & Statistics-Enhanced* condition received reports that were a combination of the *Anecdotes Only (PCAOB−L)* and the S*tatistics Only* conditions. The *Anecdotes & Statistics-Judgment Orientation* condition received the same information as the *Anecdotes & Statistics-Enhanced* condition with an added manipulation drawing attention to the statistical portion of the reports.

This indicates that participants failed to attend to the implications of the statistical data provided in small firm reports. This finding is consistent with the results of prior research that suggests decision makers ignore, or underweight, statistical data in the presence of anecdotes. The finding also serves to caution the PCAOB that their current practice of including statistics in the reports of small firms is unlikely to solve the lack of statistical context problem in large firm reports.

Test of Hypothesis 2 Results

I tested Hypothesis 2 by analyzing the extent to which the decisions of participants in the *anecdotes & statistics–enhanced* condition demonstrated a greater assimilation of statistical data than those in both the *anecdotes only (PCAOB–L)* and *anecdotes & statistics (PCAOB–S)* conditions. The results support Hypothesis 2, as a greater percentage of participants in the *anecdotes & statistics–enhanced* condition (60.0%) selected Firm B (preference consistent with statistical data), than in both the *anecdotes only (PCAOB–L)* condition (31.8%; χ^2= 6.72, p=0.005) and the *anecdotes & statistics (PCAOB–S)* condition (33.3%; χ^2= 5.64, p=0.009). It should be noted that participants in the two statistics conditions (*anecdotes & statistics (PCAOB–S)* and *anecdotes & statistics–enhanced*) were given data that reflected the same basic information. That is, all of the information given in the *anecdotes & statistics–enhanced* condition could be easily derived in the *anecdotes & statistics (PCAOB—S)* condition. The difference was the enhanced presentation of the statistical data.

My results are consistent with prior research indicating that enhanced statistical data can help to improve the assimilation of statistics into decisions. However, while a clear majority of participants (60.0%) attended to the statistical data, a rather large minority (40.0%) continued to exhibit anecdotal biases by ignoring, or underweighting, the statistical data in favor of the anecdotal data. This result is consistent with prior

research that anecdotal biases are robust, requiring substantial interventions to overcome our preference for anecdotal data. As such, I examine the incremental impact of judgment orientation.

Test of Hypothesis 3 Results

I tested Hypothesis 3 by analyzing the extent to which the decisions of participants in the *anecdotes & statistics–judgment orientation* condition differed from the decisions of those in the *anecdotes only (PCAOB–L)*, the *anecdotes & statistics (PCAOB–S)*, and the *anecdotes & statistics–enhanced* conditions. The intention of this manipulation was to provide a more forceful intervention for overcoming powerful anecdotal biases. Recall that participants in this condition were cautioned that the scope of the inspections could vary widely between firms and that the sample size taken by the inspection team was not necessarily related to firm size or historical reputation for audit quality. They were also urged to appropriately consider the number of clients inspected in addition to the number of deficiencies found when making comparisons.

The results support Hypothesis 3, as a greater percentage of participants in the *anecdotes & statistics–judgment orientation* condition (82.2%) selected Firm B (preference consistent with statistical data), than in the *anecdotes only (PCAOB–L)* condition (31.8%; χ^2= 23.10, p<0.001), the *anecdotes & statistics (PCAOB–S)* condition (33.3%; χ^2= 20.23, p<0.001), and the *anecdotes & statistics–enhanced* condition (60.0%; χ^2= 5.16, p=0.012). My results are consistent with prior psychology research and suggest that providing a statistical judgment orientation in addition to enhancing the statistics can successfully aid in increasing attention to, and assimilation of, statistical data in participants' decisions.

In addition to the decision variable, I gathered data on strength of preference (i.e., slightly prefer, moderately prefer, strongly prefer). I combined the participants' decision with their strength of preference to create a six-point scale. The judgment orientation

decision aid (H3) again resulted in a significantly higher strength of preference for Firm B in the *anecdotes & statistics-judgment orientation* condition relative to both the *anecdotes-only (PCAOB-L)* and *anecdotes & statistics (PCAOB-S)* conditions (both *p*'s <0.001), and while it was greater than the *anecdotes & statistics – enhanced* condition, the significance level was *p*=0.16. Thus, the judgment orientation decision aid influenced decisions significantly more than the enhanced statistical presentation alone (82.2% vs. 60.0%, *p*=0.012), but only marginally farther up the six-point scale. As with the decision variable, I found an insignificant contrast consistent with H1 (*p*=0.92), and I found even stronger support for H2 (both *p*'s <0.001). Overall, my findings suggest that these two decision aids effectively help participants incorporate statistics into their decisions.

Additional Analyses

In addition to the dependent variable of interest, I collected data on participant perceptions of the credibility of the audit profession and whether they believed the current regulatory oversight had been effective in uncovering and/or preventing audit failures in the past five years. An analysis of the responses to these questions yielded no differences in perceptions of audit profession credibility (F = 0.107, p = 0.98) or the effectiveness of regulatory oversight (F = 1.007, p = 0.41) across the five conditions. The overall means across all conditions on the seven point scales were 4.35 for credibility and 4.20 for regulatory effectiveness.

I also found no differences between conditions relating to their business experience (μ = 8.69, F = 0.156, p = 0.96), management experience (μ = 4.19, F = 0.506, p = 0.73), age (μ = 33.5, F = 1.037, p = 0.39), or gender (69% male and 31% female, χ^2 = 8.647, p = 0.37).

Summary

Overall, the analyses indicate that participants failed to attend to the implications of statistical data when presented in reports containing both anecdotal and statistical data (as in small firm reports). The findings indicate that without statistical context, misperceptions of audit firm quality are a potential problem and that even when statistical data are present, those misperceptions can persist as a result of an anecdotal bias. This serves to caution the PCAOB that their current practice of providing statistical information in small firm reports is unlikely to solve the lack of statistical context problem in large firm reports. However, the analyses do point to the efficacy of using statistical enhancements and judgment orientation as potentially effective decision aids.

Analyses Using the Manager Subset

Managers Only Analysis

As previously mentioned, 152 of the participants in the study were experienced managers. Since an argument can be made that experienced managers might be considered a marginally more representative participant pool, I re-ran all of the analyses using only that participant base to see whether this significant sub-group behave any differently.

The results from my experimental analysis of the manager sub-group are presented in Table 4.2 and are represented graphically in Figure 4.2. As in the first analysis using all 207 participants, I first examined whether the purely anecdotal versus purely statistical data sets resulted in managers choosing different audit firms. That is, did managers in the *anecdotes only (PCAOB–L)* condition choose Firm A (i.e., the firm with fewer total deficiencies), and did managers in the *statistics only* condition choose Firm B

(i.e., the firm with the fewest deficiencies per audit). Recall that these served as my benchmark for my analyses of the relative level of attention paid by managers to anecdotal versus statistical data in my other experimental conditions. As expected, the results show that 63.9% (36.1%) of managers in the *anecdotes only (PCAOB–L)* condition selected Firm A (Firm B) while only 13.8% (86.2%) of managers chose Firm A (Firm B) in the *statistics only* condition (χ^2= 16.60, p<0.001). This finding is consistent with the first analysis using the full 207 participants.

Test of Hypothesis 1 Using Managers Only

To see whether my analysis and conclusions would differ using the manager subgroup, I next tested Hypothesis 1 by analyzing the extent to which the decisions of managers only in the *anecdotes & statistics (PCAOB–S)* condition differed from the decisions of managers only in the *anecdotes only (PCAOB–L)* condition. These results are also consistent with the prior inclusion of all participants and Hypothesis 1, as 61.5% (38.5%) of managers in the *anecdotes & statistics (PCAOB–S)* condition selected Firm A (Firm B) as compared to 63.9% (36.1%) of managers in the *anecdotes only (PCAOB–L)* condition (χ^2= 0.04, p=0.85). This indicates that managers failed to attend to the implications of the statistical data provided in small firm reports. This finding is consistent with the results of the prior analysis that suggests decision makers ignore, or underweight, statistical data in the presence of anecdotes.

Test of Hypothesis 2 Using Managers Only

I next tested Hypothesis 2 by analyzing the extent to which the decisions of managers in the *anecdotes & statistics–enhanced* condition demonstrated a greater

TABLE 4.2
Managers' Auditor Selection Decisions

Panel A: Percent Choosing Firm Consistent with Anecdotal Data or Statistical Data

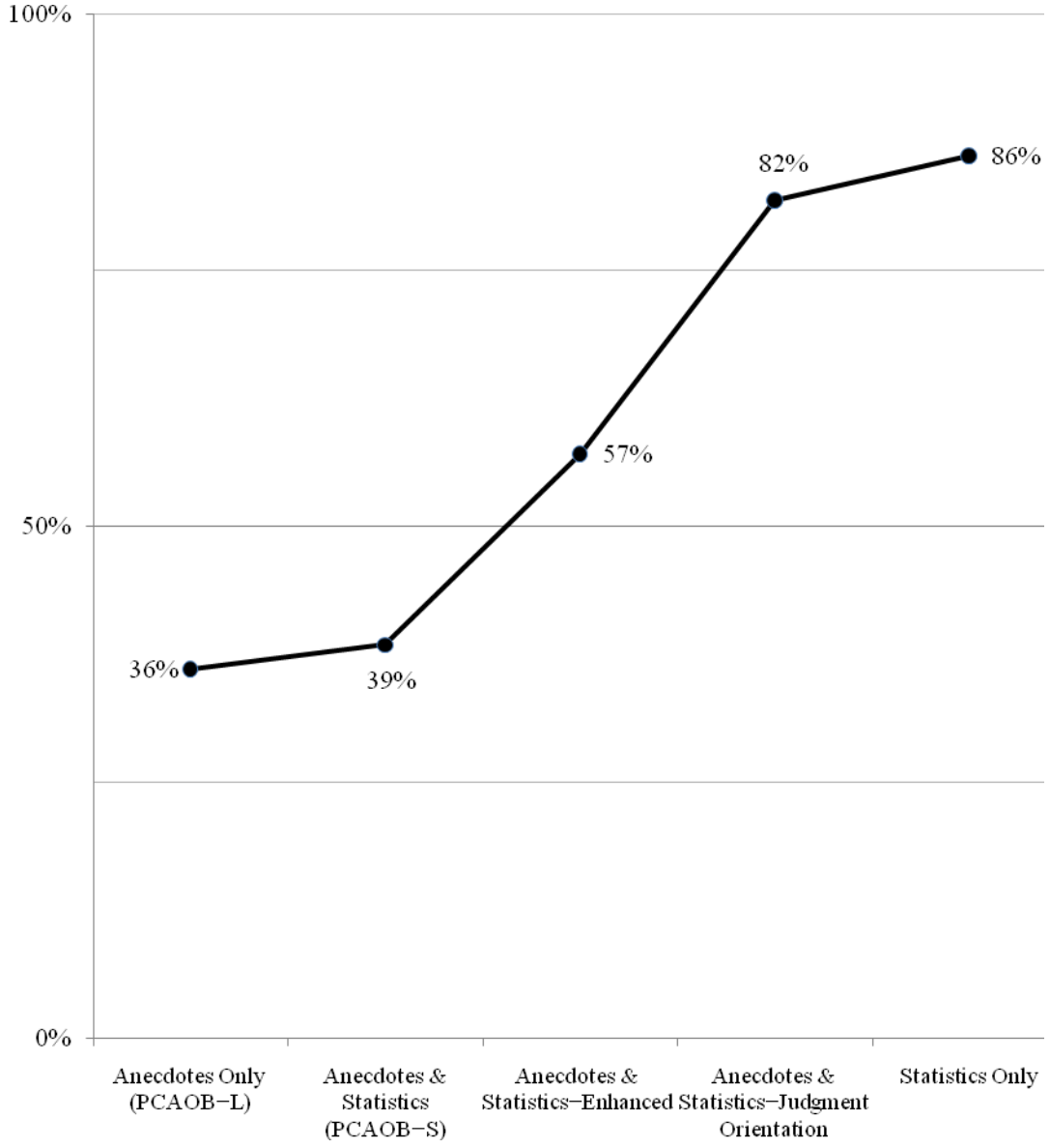
Condition	Anecdotes Consistent[a]	Statistics Consistent[b]	*n*[c]
Anecdotes Only (PCAOB−L)	63.9%	36.1%	36
Anecdotes & Statistics (PCAOB−S)	61.5%	38.5%	26
Anecdotes & Statistics−Enhanced	42.9%	57.1%	28
Anecdotes & Statistics−Judgment Orientation	18.2%	81.8%	33
Statistics Only	13.8%	86.2%	29

Panel B: Planned Contrasts

Contrast	Hypothesis	χ^2	*p*-value[d]
Anecdotes & Statistics (PCAOB−S)			
vs. Anecdotes Only (PCAOB−L)	H1	0.04	0.850
Anecdotes & Statistics−Enhanced			
vs. Anecdotes Only (PCAOB−L)	H2	2.81	0.047
vs. Anecdotes & Statistics (PCAOB−S)	H2	1.89	0.085
Anecdotes & Statistics−Judgment Orientation			
vs. Anecdotes Only (PCAOB−L)	H3	14.76	< 0.001
vs. Anecdotes & Statistics (PCAOB−S)	H3	11.69	< 0.001
vs. Anecdotes & Statistics−Enhanced	H3	4.43	0.018
Statistics Only			
vs. Anecdotes Only (PCAOB−L)		16.60	< 0.001
vs. Anecdotes & Statistics (PCAOB−S)		13.51	< 0.001
vs. Anecdotes & Statistics−Enhanced		5.96	0.015
vs. Anecdotes & Statistics−Judgment Orientation		0.22	0.639

[a] Choices consistent with the implications of the anecdotal data (i.e., the firm having the fewest number of deficiencies in total).
[b] Choices consistent with the implications of the statistical data (i.e., the firm having the fewest number of deficiencies per audit inspected).
[c] Cell size differences are a result of the software generated random assignment of participants to treatment conditions.
[d] Consistent with the hypotheses, our tests for H1 are two-tailed while tests for H2 & H3 are one-tailed. The remaining tests are all two-tailed.
In the *Anecdotes Only (PCAOB−L)* condition, participants received inspection reports containing deficiencies only, as provided in the current PCAOB reports of large audit firms. In the *Statistics Only* condition, participants received inspection reports having visually enhanced and elaborated statistical information along with a listing of areas where deficiencies were found (i.e. inventory, loan loss reserves, revenue recognition). These conditions provided a benchmark for assessing participant attention to anecdotal and statistical data. In the *Anecdotes & Statistics (PCAOB−S)* condition, participants received inspection reports containing both deficiencies and statistical information as provided in the PCAOB reports of small audit firms. The *Anecdotes & Statistics-Enhanced* condition received reports that were a combination of the *Anecdotes Only (PCAOB−L)* and the S*tatistics Only* conditions. The *Anecdotes & Statistics-Judgment Orientation* condition received the same information as the *Anecdotes & Statistics-Enhanced* condition with an added manipulation drawing attention to the statistical portion of the reports.

FIGURE 4.2
Percent of Managers Choosing the Audit Firm
Consistent with the Implications of the Statistical Data



In the *Anecdotes Only (PCAOB−L)* condition, participants received inspection reports containing deficiencies only, as provided in the current PCAOB reports of large audit firms. In the *Statistics Only* condition, participants received inspection reports having visually enhanced and elaborated statistical information along with a listing of areas where deficiencies were found (i.e. inventory, loan loss reserves, revenue recognition). These conditions provided a benchmark for assessing participant attention to anecdotal and statistical data. In the *Anecdotes & Statistics (PCAOB−S)* condition, participants received inspection reports containing both deficiencies and statistical information as provided in the PCAOB reports of small audit firms. The *Anecdotes & Statistics-Enhanced* condition received reports that were a combination of the *Anecdotes Only (PCAOB−L)* and the S*tatistics Only* conditions. The *Anecdotes & Statistics-Judgment Orientation* condition received the same information as the *Anecdotes & Statistics-Enhanced* condition with an added manipulation drawing attention to the statistical portion of the reports.

assimilation of statistical data than managers in both the *anecdotes only (PCAOB–L)* and *anecdotes & statistics (PCAOB–S)* conditions. The results are consistent with the original analysis and support Hypothesis 2, as a greater percentage of managers in the *anecdotes & statistics–enhanced* condition (57.1%) selected Firm B (preference consistent with statistical data), than both the *anecdotes only (PCAOB–L)* condition (36.1%; χ^2= 2.81, p=0.047) and the *anecdotes & statistics (PCAOB–S)* condition (38.5%; χ^2= 1.89, p=0.085). This last analysis was the only condition that differed slightly from the full analysis with all participants included where a marginal significance of p=0.085 was found between the a*necdotes & statistics–enhanced* condition versus the *anecdotes & statistics (PCAOB–S).* While this was only marginally significant (the analysis using all 207 participants found the significance between these two conditions to be p=0.009) the results are in the same expected direction and I draw the same conclusions as in the original analysis.

It should be noted again that, as was the case with all participants, managers in the two statistics conditions (*anecdotes & statistics (PCAOB–S)* and *anecdotes & statistics–enhanced*) were given data that reflected the same basic information. That is, all of the information given in the *anecdotes & statistics–enhanced* condition could be easily derived in the *anecdotes & statistics (PCAOB—S)* condition. The difference was the enhanced presentation of the statistical data.

Also consistent with what was found in the original analysis, while a clear majority of managers (57.1%) attended to the statistical data, a rather large minority (42.9%) continued to exhibit anecdotal biases by ignoring, or underweighting, the statistical data in favor of the anecdotal data. This result is consistent with prior research

that anecdotal biases are robust, requiring substantial interventions to overcome my preference for anecdotal data. As such, I examine the incremental impact of judgment orientation on the manager sub-group.

Test of Hypothesis 3 Using Managers Only

To see whether the findings would be consistent in the managers only subgroup, I tested Hypothesis 3 by analyzing the extent to which managers in the *anecdotes & statistics–judgment orientation* condition differed from the judgments of managers only in the *anecdotes only (PCAOB–L)*, the *anecdotes & statistics (PCAOB–S)*, and the *anecdotes & statistics–enhanced* conditions. Recall, the intention of this manipulation was to provide a more forceful intervention for overcoming powerful anecdotal biases. All participants in this condition were cautioned that the scope of the inspections could vary widely between firms and that the sample size taken by the inspection team was not necessarily related to firm size or historical reputation for audit quality. They were also urged to appropriately consider the number of clients inspected in addition to the number of deficiencies found when making comparisons. The results are again consistent with the prior analysis and support Hypothesis 3, as a greater percentage of managers in the *anecdotes & statistics–judgment orientation* condition (81.8%) selected Firm B (preference consistent with statistical data), than in the *anecdotes only (PCAOB–L)* condition (36.1%; χ^2= 14.76, p<0.001), the *anecdotes & statistics (PCAOB–S)* condition (38.5%; χ^2= 11.69, p<0.001), and the *anecdotes & statistics–enhanced* condition (57.1%; χ^2= 4.43, p=0.018). Again, these results are consistent with prior psychology research and suggest that providing a statistical judgment orientation in addition to enhancing the statistics can successfully aid in increasing attention to, and assimilation of, statistical data in managers' decisions.

Recall that I also gathered data on the strength of preference (i.e., slightly prefer, moderately prefer, strongly prefer). As in the previous analysis, I combined the

managers' strength of preference with their decision to create a six-point scale. The judgment orientation decision aid (H3) again increased managers' preference for Firm B over the *anecdotes-only (PCAOB-L)* and *anecdotes & statistics-(PCAOB-S)* conditions (both *p*'s <0.001) and while the means were in the right direction when compared to the *anecdotes & statistics – enhanced* decision aid condition, the difference was not statistically significant (p=0.31). Thus, the judgment orientation decision aid influenced the manager's choice of firms significantly more than the enhanced statistical presentation alone (81.8% vs. 57.1%, p=0.018), but only marginally farther up the six-point scale. As with the decision variable, we find an insignificant contrast consistent with H1 (p=0.89) and even stronger support for H2 (both *p*'s <0.001). Overall, all of my findings suggest that these two decision aids effectively helped the managers only sub-group to incorporate statistics into their decision.

Additional Analyses

In addition to the dependent variable of interest, I collected data on participant perceptions of the credibility of the audit profession and whether they believed the current regulatory oversight had been effective in uncovering and/or preventing audit failures in the past five years. An analysis of the responses to these questions yielded no differences in manager's perceptions of audit profession credibility (F = 0.403, p = 0.81) or the effectiveness of regulatory oversight (F = 2.311, p = 0.06) across the five conditions. The overall mean across all conditions on the seven point scales were 4.28 for credibility and 4.2 for regulatory effectiveness.

I also find no differences between conditions relating to their business experience (μ = 10.25, F = 0.751, p = 0.56), management experience (μ = 5.70, F = 0.699, p = 0.59), age (μ = 35.6, F = 0.673, p = 0.61), or gender (67% male and 33% female, χ^2 = 6.515, p = 0.59).

Summary

Overall, the analyses using the managers only sub-group are consistent with the previous analyses using all 207 participants. The analyses indicate that managers failed to attend to the implications of the statistical data when presented with reports containing both anecdotal and statistical data, as presented in small firm reports. The findings indicate that without statistical context, misperceptions of audit firm quality are a potential problem and that even when statistical data are added, those misperceptions can persist as a result of an anecdotal bias. Again, this serves to caution the PCAOB that their current practice of providing statistical information in small firm reports is unlikely to solve the lack of statistical context problem in large firm reports. The analyses also points to the efficacy of using statistical enhancements and judgment orientation as potentially effective decision aids.

CHAPTER 5

CONCLUSIONS

Audit committees are tasked with making auditor engagement and/or retention decisions from among competing firms, often with scant publicly available indicators of auditor quality. For better or worse, the PCAOB inspection reports are currently the only independent regulatory reporting on audit firm performance. The PCAOB reports for large firms are primarily anecdotal in nature, providing little more than a listing of deficiencies uncovered by the PCAOB inspection team, without any statistical context at all. The PCAOB reports for small firms contain the contextual data necessary for making meaningful comparisons across firms. However, prior research indicates that statistical data are often ignored or underweighted when anecdotal data are present, possibly resulting in inattention to the statistical data as presented in small firm reports.

This study demonstrates that the anecdotal data presented in PCAOB reports can lead to incorrect perceptions of audit firms. I also find that the PCAOB's practice of providing statistical context in small firm reports is ineffective; that is, users continue to focus on anecdotal data even in the presence of potentially more informative statistical data. As a result, I tested two easily implemented decision aids, a vividness enhancement and a judgment orientation, which were successful in helping participants incorporate statistical data into perceptions of audit firms, resulting in more informed audit engagement decisions.

The results of this study suggest that the current reporting of the PCAOB is flawed and can lead to misperceptions of a firm's audit performance, which can negatively affect auditor engagement decisions. My research offers, as a simple

prescription for improving the current reports, vividness enhancement and statistical judgment orientation as a way to minimize an observed anecdotal bias. As such, the improved reports can begin to produce the type of information that may be used to better assess firm performance and result in more informed audit engagement and retention decisions.

Limitations

One potential limitation of the study is that the participants used in the experiment were not actual audit committee members per se. However, as argued earlier in this paper, I conducted a review of audit committees of public companies and found a wide range of professional backgrounds and experience levels that were consistent with my sample. For example, audit committee members included managers, lawyers, physicians, engineers and other professionals across a variety of industries. So while my participants may not have been actively sitting on an audit committee, their experience and backgrounds do qualify them to serve on boards of directors and audit committees of many companies across a range of industries.

Another limitation is that in order to keep the sample size of participants to a manageable level, the experimental design was not fully crossed. I did not evaluate the judgment orientation decision aid as a stand-alone intervention. Recall that the judgment orientation was applied in addition to the enhanced statistical presentation and as a result I was unable to cleanly separate its effect on participant choices. Future research could look to see whether the judgment orientation decision aid alone would be sufficient in overcoming any anecdotal biases.

Suggestions for Future Research

The results of the study suggest a number of fruitful areas for future research. Consistent with prior psychology research, I found that anecdotal biases occur when evaluating PCAOB inspection reports, which can lead to incorrect perceptions of audit firms. Future research could investigate whether anecdotal biases are prevalent in other areas of accounting. This study identified two decision aids that help to increase attention to statistical data, thereby mitigating the anecdotal bias. Future research could identify and test the efficacy of other decision aids in overcoming this observed bias.

The US Department of the Treasury's Advisory Committee on the Auditing Profession (2008) has recommended that the PCOAB, in collaboration with industry and academics, identify indicators of audit quality in order to help audit committees make auditor engagement decisions. While future research may succeed in identifying additional indicators of audit quality that can be made available to audit committees for such use, this study serves to caution the manner in which that data is included. This study found that the anecdotal data presented in PCAOB inspection reports were powerfully persuasive, overwhelming the statistical information provided and may likewise, affect the assimilation of other indicators of audit quality into audit engagement and retention decisions.

My results suggest that the current reporting of the PCAOB is flawed and can lead to misperceptions of a firm's audit performance, which can negatively affect auditor engagement decisions. I offer, as a simple prescription for improving the current reports, vividness enhancement and statistical judgment orientation as a way to minimize an observed anecdotal bias. As such, the improved reports can produce the type of

information that may be used to better assess firm performance and result in more informed audit engagement and retention decisions.

APPENDIX

RESEARCH INSTRUMENT

The instruments that participants received are presented on the following pages. A short description is provided before each instrument describing which of the five conditions it relates to and the information provided.

Introduction and Background Information

The following contains the study's introduction and background information which was provided to participants in each condition.

Thank you for agreeing to participate in this research study.

The purpose of the study is to investigate decisions concerning the selection of audit firms. Your participation is voluntary and any responses you provide will be kept completely anonymous. The study should only take about 15-20 minutes to complete.

This study looks at certain factors involved in the selection of an external auditor for a given company. While we understand that many factors may go into making decisions of this kind, we are interested in the information presented here and how it would impact your professional judgment.

Please read the following case study and answer the questions provided.

If you have any questions about this research, please contact James Wainberg at jamesw@som.umass.edu.

Please provide your name and the course you are attending so that we may add you to the raffle for an 8 GB IPod nano and also to remove you from further emails requesting your participation. Your information will be kept completely confidential.

Thanks again for your participation!

First Name

Last Name

Course Name

Auditor Selection for Jefferson Circuit Assembly

You are a member of the committee that selects the external auditor for Jefferson Circuit Assembly, a medium sized publicly-traded electronics manufacturing company. The audit committee is currently reviewing the credentials of prospective accounting firms to perform next year's audit. The committee has narrowed the decision down to two firms, Firm ABC and Firm XYZ. The two firms are identical in size and both have historically enjoyed a good reputation for offering quality audit services.

In addition to reviewing the promotional materials provided to you by each firm, you obtain and review the publicly available Federal Public Auditor Regulatory Board (FPARB) inspection reports for each firm. The FPARB performs yearly inspections on accounting firms that audit publicly-traded companies to ensure the quality and integrity of the audit profession. In other words, the FPARB's job is to 'audit the auditors'.

The FPARB inspection process involves selecting a sample of the Firm's audit clients and then reviewing the conduct of each of those audits. The number of clients selected is left to the discretion of each FPARB inspection team and tends to vary widely between firms (some firms may have many clients inspected while other firms may have fewer). Each deficiency uncovered by the inspectors is reported as a failure on the part of the accounting firm to sufficiently perform its duties at a given client.

The FPARB inspection reports for the two accounting firms you are considering are provided on the pages that follow. The FPARB inspection reports contain excerpts from actual Public Company Accounting Oversight Board (PCAOB) inspection reports. The reports are shortened to include only the section entitled "Review of Audit Engagements." After reviewing the inspection reports, you will be asked to make a choice as to which accounting firm you would choose to hire for your company's year-end audit.

ANECDOTES ONLY (PCAOB-L) CONDITION

This condition provided participants with inspection reports containing only anecdotal deficiencies (as provided in PCAOB large firm inspection reports). One report contained three deficiencies while the other had six deficiencies. Consistent with large firm PCAOB reports, no contextual statistics were provided.
The reports were counterbalanced to ensure no order effects.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm ABC. In reviewing the audits, the inspection team identified matters that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm ABC, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

Client A

In this audit, Firm ABC failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The Firm failed to perform sufficient procedures with respect to using the findings of a specialist hired by the client to determine the fair value assigned to acquired in-process research and development. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had obtained an understanding of certain critical methods and assumptions that the specialist used, or that it had performed tests of certain critical data provided to the specialist.

Client B

In this audit, Firm ABC failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects –

- When testing inventory, the Firm relied on the client's inventory cycle count process without appropriately evaluating the design of the cycle count controls or testing the cycle count procedures. For example, the Firm failed to test the client's cycle count process to evaluate whether all inventory items were subject to cycle counting and whether the reports that were used in the process were complete and accurate. In addition, the Firm observed and concurrently tested only a single cycle count, although the Firm relied on this control to function effectively throughout the year.

- The client had a note receivable from a shareholder that was secured by the shareholder's ownership interest in the client. The client considered the collection of the note to be uncertain and determined that the value of the note receivable should be based on the value of the shareholder's ownership interest in the client. The Firm, however, failed to obtain information to corroborate management's representations by, for example, making inquiries of the client's lawyers.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm XYZ. In reviewing the audits, the inspection team identified matters that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm XYZ, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

Client A

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The client held investments in certain illiquid securities. The Firm failed to perform sufficient procedures to evaluate the client's valuation of these securities. While the Firm obtained an understanding of the process the client had used to obtain information regarding the fair value of the securities and performed other audit procedures, the Firm failed to evaluate the reasonableness of certain of the assumptions related to the underlying information used to develop and support the estimated fair values.

Client B

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects–

- When testing inventory, the Firm applied a controls reliance strategy, which included reliance on IT controls. The Firm's work papers indicated that the results of its tests of the client's information technology general controls did not support a conclusion that the client's information processing was reliable. The Firm, however, did not perform any additional procedures to address its finding, nor did it modify its audit strategy.

- The Firm tested minimum rental income primarily through the use of analytical procedures that did not meet the requirements for substantive analytical procedures. The Firm did not set an expectation that was precise enough to provide the desired level of assurance that differences that may be potential material misstatements, individually or when aggregated, would be identified for investigation.

Client C

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The Firm did not perform sufficient audit procedures to test the allowance for loan losses. The Firm's procedures for certain loans were limited to recalculating and comparing reserve factors from the current year to prior years and obtaining explanations from the client for changes. With respect to other loans, the Firm's procedures were limited to recalculating the factors.

Client D

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects–

- There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had evaluated whether the client's use of the straight-line method of amortization for acquired customer-related intangible assets reflected the pattern in which the economic benefits of the intangible asset were being consumed or otherwise used up. In addition, the Firm failed to evaluate whether, in light of actual customer attrition rates, the asset's life should have been adjusted.

- The Firm failed to perform, or failed to include in the work papers evidence that it performed, sufficient analysis to assess the appropriateness of the client's classification of a divested business as a discontinued operation. In connection with the divestiture, the client entered into certain agreements with the acquirer which called into question whether the operations and cash flows of the divested business would be eliminated from the ongoing operations of the client, and thus whether presentation of the divested business as a discontinued operation was appropriate.

STATISTICS ONLY CONDITION

This condition provided participants with inspection reports containing only statistical information and the audit area in which the deficiencies was found. The statistics provided the total number of clients inspected, the number of clients where deficiencies were found, the total number of deficiencies found, the average number of deficiencies per client inspected, the ratio and percentage of clients with deficiencies to all clients inspected, and the ratio and percentage of clients without deficiencies to all clients inspected.

The reports were counterbalanced to ensure no order effects.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm ABC on two clients. In reviewing the audits, the inspection team identified a total of three matters across two clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm ABC, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	2
Total Number of Clients Where Deficiencies Were Found:	2
Total Number of Deficiencies Found:	3
Average Number of Deficiencies Per Client Inspected:	1.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	2/2 (100%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	0/2 (0%)

Results by Client Inspected For Audit Firm ABC:

Client Inspected	Deficiencies Found	Area of Audit Deficiency
Client A	1	1. Fair-Value Assessment
Client B	2	1. Inventory 2. Notes Receivable

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm XYZ on twelve clients. In reviewing the audits, the inspection team identified a total of six matters across four clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm XYZ, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	12
Total Number of Clients Where Deficiencies Were Found:	4
Total Number of Deficiencies Found:	6
Average Number of Deficiencies Per Client Inspected:	0.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	4/12 (33%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	8/12 (67%)

Results by Client Inspected For Audit Firm XYZ:

Client Inspected	Deficiencies Found	Area of Audit Deficiency
Client A	0	No Deficiencies Found
Client B	0	No Deficiencies Found
Client C	1	1. Security Valuation
Client D	0	No Deficiencies Found
Client E	0	No Deficiencies Found
Client F	2	1. Inventory 2. Rental Income

Results by Client Inspected For Firm XYZ Continued:

Client Inspected	Deficiencies Found	Area of Audit Deficiency
Client G	0	No Deficiencies Found
Client H	1	1. Loan Loss Reserves
Client I	0	No Deficiencies Found
Client J	0	No Deficiencies Found
Client K	2	1. Intangible Assets 2. Discontinued Operations
Client L	0	No Deficiencies Found

ANECDOTES & STATISTICS (PCAOB-S) CONDITION

This condition provided participants with inspection reports containing anecdotal deficiencies identical to those in the Anecdotes Only (PCAOB-L) condition and statistical information (as provided in PCAOB small firm reports). The statistics provided the total number of clients that were inspected, the number of clients where deficiencies were found, and the total number of deficiencies found.
The reports were counterbalanced to ensure no order effects.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm ABC on two clients. In reviewing the audits, the inspection team identified a total of three matters across two clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm ABC, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

Client A

In this audit, Firm ABC failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The Firm failed to perform sufficient procedures with respect to using the findings of a specialist hired by the client to determine the fair value assigned to acquired in-process research and development. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had obtained an understanding of certain critical methods and assumptions that the specialist used, or that it had performed tests of certain critical data provided to the specialist.

Client B

In this audit, Firm ABC failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects –

- When testing inventory, the Firm relied on the client's inventory cycle count process without appropriately evaluating the design of the cycle count controls or testing the cycle count procedures. For example, the Firm failed to test the client's cycle count process to evaluate whether all inventory items were subject to cycle counting and whether the reports that were used in the process were complete and accurate. In addition, the Firm observed and concurrently tested only a single cycle count, although the Firm relied on this control to function effectively throughout the year.

- The client had a note receivable from a shareholder that was secured by the shareholder's ownership interest in the client. The client considered the collection of the note to be uncertain and determined that the value of the note receivable should be based on the value of the shareholder's ownership interest in the client. The Firm, however, failed to obtain information to corroborate management's representations by, for example, making inquiries of the client's lawyers.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm XYZ on twelve clients. In reviewing the audits, the inspection team identified a total of six matters across four clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm XYZ, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

Client A

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The client held investments in certain illiquid securities. The Firm failed to perform sufficient procedures to evaluate the client's valuation of these securities. While the Firm obtained an understanding of the process the client had used to obtain information regarding the fair value of the securities and performed other audit procedures, the Firm failed to evaluate the reasonableness of certain of the assumptions related to the underlying information used to develop and support the estimated fair values.

Client B

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects–

- When testing inventory, the Firm applied a controls reliance strategy, which included reliance on IT controls. The Firm's work papers indicated that the results of its tests of the client's information technology general controls did not support a conclusion that the client's information processing was reliable. The Firm, however, did not perform any additional procedures to address its finding, nor did it modify its audit strategy.

- The Firm tested minimum rental income primarily through the use of analytical procedures that did not meet the requirements for substantive analytical procedures. The Firm did not set an expectation that was precise enough to provide the desired level of assurance that differences that may be potential material misstatements, individually or when aggregated, would be identified for investigation.

Client C

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following respect–

- The Firm did not perform sufficient audit procedures to test the allowance for loan losses. The Firm's procedures for certain loans were limited to recalculating and comparing reserve factors from the current year to prior years and obtaining explanations from the client for changes. With respect to other loans, the Firm's procedures were limited to recalculating the factors.

Client D

In this audit, Firm XYZ failed to obtain sufficient competent evidential matter to support its audit opinion in the following two respects–

- There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had evaluated whether the client's use of the straight-line method of amortization for acquired customer-related intangible assets reflected the pattern in which the economic benefits of the intangible asset were being consumed or otherwise used up. In addition, the Firm failed to evaluate whether, in light of actual customer attrition rates, the asset's life should have been adjusted.

- The Firm failed to perform, or failed to include in the work papers evidence that it performed, sufficient analysis to assess the appropriateness of the client's classification of a divested business as a discontinued operation. In connection with the divestiture, the client entered into certain agreements with the acquirer which called into question whether the operations and cash flows of the divested business would be eliminated from the ongoing operations of the client, and thus whether presentation of the divested business as a discontinued operation was appropriate.

ANECDOTES & STATISTICS – ENHANCED CONDITION

This condition is a combination of the Anecdotes Only (PCAOB-L) and the Statistics Only conditions. Participants were provided with inspection reports containing anecdotal deficiencies as provided in the Anecdotes Only (PCAOB-L) condition along with the statistical information provided in the Statistics Only condition.
The reports were counterbalanced to ensure no order effects.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm ABC on two clients. In reviewing the audits, the inspection team identified a total of three matters across two clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm ABC, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	2
Total Number of Clients Where Deficiencies Were Found:	2
Total Number of Deficiencies Found:	3
Average Number of Deficiencies Per Client Inspected:	1.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	2/2 (100%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	0/2 (0%)

Results by Client Inspected For Audit Firm ABC:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client A	1	1. The Firm failed to perform sufficient procedures with respect to using the findings of a specialist hired by the client to determine the fair value assigned to acquired in-process research and development. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had obtained an understanding of certain critical methods and assumptions that the specialist used, or that it had performed tests of certain critical data provided to the specialist.

Results by Client Inspected For Firm ABC Continued:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client B	2	1. When testing inventory, the Firm relied on the client's inventory cycle count process without appropriately evaluating the design of the cycle count controls or testing the cycle count procedures. For example, the Firm failed to test the client's cycle count process to evaluate whether all inventory items were subject to cycle counting and whether the reports that were used in the process were complete and accurate. In addition, the Firm observed and concurrently tested only a single cycle count, although the Firm relied on this control to function effectively throughout the year. 2. The client had a note receivable from a shareholder that was secured by the shareholder's ownership interest in the client. The client considered the collection of the note to be uncertain and determined that the value of the note receivable should be based on the value of the shareholder's ownership interest in the client. The Firm, however, failed to obtain information to corroborate management's representations by, for example, making inquiries of the client's lawyers.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm XYZ on twelve clients. In reviewing the audits, the inspection team identified a total of six matters across four clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm XYZ, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	12
Total Number of Clients Where Deficiencies Were Found:	4
Total Number of Deficiencies Found:	6
Average Number of Deficiencies Per Client Inspected:	0.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	4/12 (33%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	8/12 (67%)

Results by Client Inspected For Audit Firm XYZ:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client A	0	No Deficiencies Found
Client B	0	No Deficiencies Found
Client C	1	1. The client held investments in certain illiquid securities. The Firm failed to perform sufficient procedures to evaluate the client's valuation of these securities. While the Firm obtained an understanding of the process the client had used to obtain information regarding the fair value of the securities and performed other audit procedures, the Firm failed to evaluate the reasonableness of certain of the assumptions related to the underlying information used to develop and support the estimated fair values.

Results by Client Inspected For Audit Firm XYZ Continued:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client D	0	No Deficiencies Found
Client E	0	No Deficiencies Found
Client F	2	1. When testing inventory, the Firm applied a controls reliance strategy, which included reliance on IT controls. The Firm's work papers indicated that the results of its tests of the client's information technology general controls did not support a conclusion that the client's information processing was reliable. The Firm, however, did not perform any additional procedures to address its finding, nor did it modify its audit strategy. 2. The Firm tested minimum rental income primarily through the use of analytical procedures that did not meet the requirements for substantive analytical procedures, as the Firm did not set an expectation that was precise enough to provide the desired level of assurance that differences that may be potential material misstatements, individually or when aggregated, would be identified for investigation.
Client G	0	No Deficiencies Found
Client H	1	1. The Firm did not perform sufficient audit procedures to test the allowance for loan losses. The Firm's procedures for certain loans were limited to recalculating and comparing reserve factors from the current year to prior years and obtaining explanations from the client for changes. With respect to other loans, the Firm's procedures were limited to recalculating the factors.
Client I	0	No Deficiencies Found
Client J	0	No Deficiencies Found

Results by Client Inspected For Audit Firm XYZ Continued:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client K	2	1. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had evaluated whether the client's use of the straight-line method of amortization for acquired customer-related intangible assets reflected the pattern in which the economic benefits of the intangible asset were being consumed or otherwise used up. In addition, the Firm failed to evaluate whether, in light of actual customer attrition rates, the asset's life should have been adjusted. 2. The Firm failed to perform, or failed to include in the work papers evidence that it performed, sufficient analysis to assess the appropriateness of the client's classification of a divested business as a discontinued operation. In connection with the divestiture, the client entered into certain agreements with the acquirer which called into question whether the operations and cash flows of the divested business would be eliminated from the ongoing operations of the client, and thus whether presentation of the divested business as a discontinued operation was appropriate.
Client L	0	No Deficiencies Found

ANECDOTES & STATISTICS – JUDGMENT ORIENTATION CONDITION

This condition provided reports containing the same anecdotal and statistical information as in the Anecdotes & Statistics–Enhanced condition. However, each report began with a statistical judgment orientation in order to further focus attention on the statistical data. The reports were counterbalanced to ensure no order effects.

The following FPARB inspection report provides an overview of the inspection teams' audit of Firm ABC. The first part of the report provides a statistical summary of the results, including data on the scope (i.e., the number of clients the inspection team audited) and the frequency with which deficiencies were found. The second part of the report provides a more detailed description of each deficiency that the inspection team encountered.

The FPARB inspection process involves selecting a sample of Firm ABC's audit clients and then reviewing the conduct of each of those audits. The number of clients sampled, however, is left to the discretion of each FPARB inspection team and tends to vary widely between firms and is not necessarily related to firm size or historical reputation for audit quality.

> The FPARB cautions the users of these reports to take care not to overweight the sheer number of deficiencies reported without appropriately considering the number of clients inspected.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm ABC on two clients. In reviewing the audits, the inspection team identified a total of three matters across two clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm ABC, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	2
Total Number of Clients Where Deficiencies Were Found:	2
Total Number of Deficiencies Found:	3
Average Number of Deficiencies Per Client Inspected:	1.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	2/2 (100%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	0/2 (0%)

Results by Client Inspected For Firm ABC:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client A	1	1. The Firm failed to perform sufficient procedures with respect to using the findings of a specialist hired by the client to determine the fair value assigned to acquired in-process research and development. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had obtained an understanding of certain critical methods and assumptions that the specialist used, or that it had performed tests of certain critical data provided to the specialist.
Client B	2	1. When testing inventory, the Firm relied on the client's inventory cycle count process without appropriately evaluating the design of the cycle count controls or testing the cycle count procedures. For example, the Firm failed to test the client's cycle count process to evaluate whether all inventory items were subject to cycle counting and whether the reports that were used in the process were complete and accurate. In addition, the Firm observed and concurrently tested only a single cycle count, although the Firm relied on this control to function effectively throughout the year. 2. The client had a note receivable from a shareholder that was secured by the shareholder's ownership interest in the client. The client considered the collection of the note to be uncertain and determined that the value of the note receivable should be based on the value of the shareholder's ownership interest in the client. The Firm, however, failed to obtain information to corroborate management's representations by, for example, making inquiries of the client's lawyers.

FPARB Release Number 197-2008-036

Inspection of Audit Firm XYZ
2008

FPARB
Federal Public Auditor Regulatory Board

The following FPARB inspection report provides an overview of the inspection teams' audit of Firm XYZ. The first part of the report provides a statistical summary of the results, including data on the scope (i.e., the number of clients the inspection team audited) and the frequency with which deficiencies were found. The second part of the report provides a more detailed description of each deficiency that the inspection team encountered.

The FPARB inspection process involves selecting a sample of Firm XYZ's audit clients and then reviewing the conduct of each of those audits. The number of clients sampled, however, is left to the discretion of each FPARB inspection team and tends to vary widely between firms and is not necessarily related to firm size or historical reputation for audit quality.

> The FPARB cautions the users of these reports to take care not to overweight the sheer number of deficiencies reported without appropriately considering the number of clients inspected.

A. Review of Audit Engagements

The scope of the inspection procedures performed included reviews of aspects of selected audits of financial statements and of internal control over financial reporting performed by Firm XYZ on twelve clients. In reviewing the audits, the inspection team identified a total of six matters across four clients that it considered to be audit deficiencies. The deficiencies identified were of such significance that it appeared to the inspection team that Firm XYZ, at the time it issued its audit report, had not obtained sufficient competent evidential matter to support its opinion on the client's financial statements. The deficiencies that reached this degree of significance are described below.

SUMMARY OF FINDINGS ACROSS ALL CLIENTS INSPECTED	
Total Number of Clients Inspected:	12
Total Number of Clients Where Deficiencies Were Found:	4
Total Number of Deficiencies Found:	6
Average Number of Deficiencies Per Client Inspected:	0.5
Ratio (%) of Clients With Deficiencies To All Clients Inspected:	4/12 (33%)
Ratio (%) of Clients Without Deficiencies To All Clients Inspected:	8/12 (67%)

Results by Client Inspected For Firm XYZ:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client A	0	No Deficiencies Found
Client B	0	No Deficiencies Found
Client C	1	1. The client held investments in certain illiquid securities. The Firm failed to perform sufficient procedures to evaluate the client's valuation of these securities. While the Firm obtained an understanding of the process the client had used to obtain information regarding the fair value of the securities and performed other audit procedures, the Firm failed to evaluate the reasonableness of certain of the assumptions related to the underlying information used to develop and support the estimated fair values.
Client D	0	No Deficiencies Found
Client E	0	No Deficiencies Found
Client F	2	1. When testing inventory, the Firm applied a controls reliance strategy, which included reliance on IT controls. The Firm's work papers indicated that the results of its tests of the client's information technology general controls did not support a conclusion that the client's information processing was reliable. The Firm, however, did not perform any additional procedures to address its finding, nor did it modify its audit strategy. 2. The Firm tested minimum rental income primarily through the use of analytical procedures that did not meet the requirements for substantive analytical procedures, as the Firm did not set an expectation that was precise enough to provide the desired level of assurance that differences that may be potential material misstatements, individually or when aggregated, would be identified for investigation.
Client G	0	No Deficiencies Found
Client H	1	1. The Firm did not perform sufficient audit procedures to test the allowance for loan losses. The Firm's procedures for certain loans were limited to recalculating and comparing reserve factors from the current year to prior years and obtaining explanations from the client for changes. With respect to other loans, the Firm's procedures were limited to recalculating the factors.
Client I	0	No Deficiencies Found
Client J	0	No Deficiencies Found

Results by Client Inspected For Firm XYZ Continued:

Client Inspected	Deficiencies Found	Client-Specific Description of Deficiency Found
Client K	2	1. There was no evidence in the audit documentation, and no persuasive other evidence, that the Firm had evaluated whether the client's use of the straight-line method of amortization for acquired customer-related intangible assets reflected the pattern in which the economic benefits of the intangible asset were being consumed or otherwise used up. In addition, the Firm failed to evaluate whether, in light of actual customer attrition rates, the asset's life should have been adjusted. 2. The Firm failed to perform, or failed to include in the work papers evidence that it performed, sufficient analysis to assess the appropriateness of the client's classification of a divested business as a discontinued operation. In connection with the divestiture, the client entered into certain agreements with the acquirer which called into question whether the operations and cash flows of the divested business would be eliminated from the ongoing operations of the client, and thus whether presentation of the divested business as a discontinued operation was appropriate.
Client L	0	No Deficiencies Found

DEPENDENT VARIABLE AND DEMOGRAPHIC QUESTIONS

The first question captured my decision variable representing the participant's choice of firm (i.e., dependent variable) along with their strength of preference.

The second and third questions were supplemental and asked to assess the participant's global impression of the audit profession and the industry's regulatory oversight today.

The remaining questions collected demographic information.

1. Given all the information you've reviewed, which audit firm would you choose to perform Jefferson Circuit Assembly's audit next year?

(Please indicate your preference by selecting the number on the scale below that best represents your judgment. The closer you respond to the endpoints, the stronger your preference for that firm)

Strongly Prefer Firm ABC	Moderately Prefer Firm ABC	Slightly Prefer Firm ABC	Slightly Prefer Firm XYZ	Moderately Prefer Firm XYZ	Strongly Prefer Firm XYZ
☐	☐	☐	☐	☐	☐

2. Please indicate on the scale below how credible you believe the audit profession is today.

(Please indicate your choice by selecting a point on the scale below that best represents your judgment. The closer you respond to the endpoints, the stronger your preference for that statement)

Not Very Credible Very Credible

☐ ☐ ☐ ☐ ☐ ☐ ☐

3. Given the oversight initiated by the Sarbanes-Oxley Act of 2002, please indicate on the scale below how effective you believe the regulatory oversight has been at uncovering and/or preventing audit failures in the last five years.

(Please indicate your choice by selecting a point on the scale below that best represents your judgment. The closer you respond to the endpoints, the stronger your preference for that statement)

Very Ineffective Very Effective

☐ ☐ ☐ ☐ ☐ ☐ ☐

Please provide the following information:

Total Years of Business Experience: _____

Total Years of Managerial or Supervisory Experience:_____

Present job title: _____

Age: _____

Please indicate your gender:

☐ Male ☐ Female

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