Risk-based Auditing, Strategic Prompts and Auditor Sensitivity to the Strategic Risk of Fraud

Abstract

Under risk-based auditing, more (fewer) audit resources are allocated to accounts that are more (less) likely to be misstated. However, if auditors do not anticipate the strategic risk that arises when financial reporting managers anticipate auditors’ risk-based resource allocations, undetected misstatements among ostensibly low-risk accounts could be much more common than traditional risk assessment procedures suggest. Using a laboratory experiment, this study demonstrates this potential weakness of risk-based auditing and examines whether prompting auditors to form beliefs about managers’ expectations of, and responses to, audit strategies can enhance auditors’ sensitivity to the strategic risk of fraud. I find that participants assuming the auditor role in an abstract audit setting do not naturally attune to strategic risks but instead focus resources on accounts with high non-strategic risk and fail to allocate sufficient resources to ostensibly low-risk accounts that are consequently high in strategic risk. Participants in the manager role exploit these resource allocations by overriding the low-risk accounts more often than the accounts with high non-strategic risk. However, when auditor-participants are asked to consider those managers’ expectations of, and responses to, audit resource allocations, auditor-participants devote additional resources to the low-risk accounts but no additional resources to high-risk accounts.

**Keywords:** audit resource allocation; strategic reasoning; fraud risk; risk-based auditing; experimental economics.

**Data Availability:** Data used in this study are available upon request.
I. Introduction

The basic premise of risk-based auditing is that auditors should devote more resources to accounts that are likely to be misstated and fewer resources to those that are less likely to be misstated (Bell et al. 2005; Rittenberg and Schwieger 2005; Knechel 2007). Such an approach is expected to lead to more effective and efficient audits (e.g., Bell et al. 2005; PCAOB 2007a). However, if auditors do not accurately assess misstatement risk at the account level, audit resources will be misallocated, resulting in undetected misstatements (e.g., Kinney 2005; O’Donnell and Schultz 2005).

One reason auditors could wrongly assess misstatement risk is by focusing on observable non-strategic risk factors that indicate certain accounts are likely, and others are unlikely, to be misstated and by failing to appreciate the attendant implications for unobservable strategic risks that arise when financial reporting managers anticipate that auditors will allocate resources based on those non-strategic risk factors (Fellingham and Newman 1985).1 By fixating on non-strategic risk factors and by allocating resources accordingly, auditors could actually create opportunities for fraud among the ostensibly low-risk accounts.

The HealthSouth audit failure provides an example of such an outcome. Having apparently assessed fixed assets as a low-risk account, HealthSouth’s auditors reportedly devoted relatively few resources to testing fixed assets, particularly to vouching smaller fixed asset additions. HealthSouth’s management anticipated this strategy and exploited it by capitalizing certain expenses into the fixed asset accounts (Weil 2004).

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1 For example, the quality of the accounting system and internal controls, frequency and complexity of transactions and prevalence of management judgments are observable factors that could suggest that misstatements are more, or less, likely to occur within certain accounts.
The purpose of this study is to demonstrate this potential weakness of risk-based auditing by examining the way in which auditors allocate resources among accounts that differ in non-strategic risk and by examining the strategic implications of these allocations for account-specific misstatement risk. While a number of prior studies consider strategic audit settings (e.g., Fellingham and Newman 1985; Shibano 1990; King 2002; Fischbacher and Stefani 2007; Bowlin et al. 2009; Hoffman and Zimbelman 2009), those studies primarily focus on the auditor’s overall choice of effort or on the auditor’s specific strategy with respect to a single financial statement account rather than on auditor resource allocations among accounts.

I further examine a class of interventions designed to overcome this weakness. Although audit standards and extant research acknowledge that auditees might anticipate and exploit auditors’ risk-based strategies (e.g., AICPA 2003; Peecher et al. 2007; Hoffman and Zimbelman 2009), few prior studies have proposed or tested interventions designed to enhance auditors’ sensitivity to that possibility. An important exception is Hoffman and Zimbelman (2009), who find that prompting auditors to consider likely client responses to audit strategies leads to more effective modifications of a standard audit program in a single-account setting where the risk of fraud specific to that account (revenue) is known to be high.

My study builds on Hoffman and Zimbelman (2009) in two important ways. First, I use a multi-account setting to explore the way in which auditors allocate a limited pool of resources among client accounts that differ in non-strategic risk and whether client managers anticipate and exploit those allocations. Second, I examine whether prompting strategic reasoning can enhance auditor sensitivity to the potential manager
exploitation of auditors’ risk-based resource allocations and whether such prompts could thereby improve auditor risk assessments and the effectiveness and efficiency of audit resource allocations among accounts. By comparison, Hoffman and Zimbelman (2009) focus on the use of prompts in improving auditor anticipation of, and responses to, specific modes of fraud when an account is already known to be high in fraud risk.

To address these questions, I conduct a laboratory experiment where student participants assume the role of external auditor or financial reporting manager and interact in a two-account audit setting, where the accounts differ in that one has significantly higher non-strategic risk of misstatement relative to the other (hereafter the “high-risk” and “low-risk” accounts).2 In this setting, the manager chooses whether to override each account, and the auditor allocates a limited pool of resources between the two accounts. Although these accounts differ greatly in non-strategic risk, the auditor’s Nash equilibrium resource allocations are much less extreme than the differential non-strategic risks would imply. That is, because of the low-risk account’s lower non-strategic risk, the strategic manager expects that account to draw relatively little auditor attention, and therefore, the manager views it as a ripe opportunity for intentional misstatement, creating differential strategic risks that an auditor should consider along with the exogenous non-strategic risks. This between-account difference in non-strategic risk provides a within-subjects variable as part of the experimental design.3

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2 Experimental materials do not use terms such as auditor, manager, audit, fraud, etc., but instead use neutral terminology so that participants’ choices were not influenced by their beliefs about how auditors and managers ought to behave (Haynes and Kachelmeier 1998). However, for clarity, I generally use the more meaningful terminology in this manuscript. For further expository convenience, I generally refer to participants simply as “auditors” and “managers” although all participants are students, who assume those roles for the purposes of this study.

3 Phillips (1999) similarly examines auditor sensitivity to the presence of fraud in a multi-account setting, where misstatement risk differs between accounts. However, Phillips (1999) focuses on the eventual
I also manipulate whether auditors receive a strategic prompt. Auditors in the prompt condition are informed of the non-strategic risk probabilities and are additionally prompted to consider the strategic implications of that information, while auditors in the no prompt condition are only provided with the non-strategic risk probabilities. Each auditor in the prompt condition is specifically asked to report his or her beliefs about how the manager expects the auditor to allocate resources and how the manager is likely to respond to such an allocation.

Prior research has demonstrated that resource constraints can affect the way in which auditors perceive and respond to risk (Houston 1999; Asare et al. 2000), which suggests that the constraints on audit resources could also affect the usefulness of strategic prompts. Therefore, I additionally manipulate the amount of resources available to the auditor in order to determine whether the effectiveness of the strategic prompt is robust to the degree of resource constraint. In the adequate resources condition, resources are limited to an amount that slightly exceeds that required by the Nash equilibrium, whereas in the excess resources condition, the level of available resources is well above the equilibrium level.

I find that participants in the auditor role tend to allocate fewer resources to the low-risk account relative to the high-risk account and participants in the manager role respond by overriding the low-risk account more often than the high-risk account. This results in more undetected misstatements in the ostensibly low-risk account than in the high-risk account, despite the high-risk account’s relatively high level of non-strategic evaluation of audit evidence, whereas the current study is concerned with sensitivity to the strategic implications of differences in non-strategic risk during the risk assessment and planning phases of the audit.

4 In practice, auditors likely learn of non-strategic risk probabilities through experience, professional or firm guidance and analysis of client accounting systems.
risk. However, compared to auditors in the no prompt condition, prompted auditors tend to utilize more of their available resources and tend to allocate significantly more resources to the ostensibly low-risk account but not significantly more resources to the high-risk account. This indicates that the strategic prompt does not simply result in an across-the-board increase in resource deployment, which could be inefficient, but instead enhances strategic reasoning with the result that resources are deployed more effectively while maintaining efficiency. I further find that these results are robust to the level of resources available to the auditor, though auditors do utilize more resources under the excess resources condition.

These results demonstrate an important potential weakness of risk-based auditing that has been largely overlooked in the accounting literature; that is, by failing to appreciate the strategic nature of fraud, auditors may not appropriately deploy their resources resulting in failure to detect the intentional misstatements among ostensibly low-risk accounts that occur when managers anticipate that auditors will not focus resources on those accounts. However, the results further suggest that prompting auditors to form beliefs about managers’ expectations of, and responses to, auditors’ strategies may enhance auditor sensitivity to strategic fraud risk and result in more effective deployment of resources. Therefore, standard-setters and audit firms could potentially improve audit effectiveness by incorporating such strategic prompts into auditing standards and other professional guidance. These results may be particularly important to the Public Company Accounting Oversight Board (the “PCAOB”), which encourages a risk-based approach to integrated audits of internal controls and financial statements (PCAOB 2007) and is considering new auditor risk assessment standards (PCAOB 2009).
In Section II, I describe the setting for this study as well as the game-theoretic predictions. I develop hypotheses and describe the experimental design and method in Sections III and IV, respectively. Section V presents analysis of the results followed by concluding comments in Section VI.

II. Setting

Game theoretic models of auditing (e.g., Shibano 1990; Bloomfield 1995; Newman et al. 2005) demonstrate that the risk of fraud is endogenous in that the financial reporting manager’s optimal reporting strategy depends on his or her expectations of the auditor’s strategy. This study examines a multi-account audit setting constructed following the game-theoretic reasoning described in that prior analytic research and adapted in prior behavioral research (e.g., Bloomfield 1997; King 2002; Fischbacher and Stefani 2007; and Bowlin et al. 2009).

In this setting, the auditor is responsible for detecting misstatements within two financial statement accounts, \( i \in \{1, 2\} \), either of which could be misstated due to a non-strategic accounting system error or due to the financial reporting manager’s strategic override of the accounting system. To that end, the auditor allocates a fixed pool of audit resources among the two audited accounts and his or her personal consumption.

Following Bloomfield (1997), the accounting system materially misstates each account balance with probability \( r_i \), which differs between accounts and represents each account’s non-strategic risk. Although the value of \( r_i \) is common knowledge by assumption, neither the manager nor the auditor knows whether the accounting system will actually generate a misstatement prior to making their respective choices. Thus,
simultaneous with the accounting system’s outcome, the manager chooses whether to accept that outcome or to override the accounting system. If the manager chooses to override an account, that account will be misstated with certainty but will not also be unintentionally misstated. In practice, multiple misstatements could occur within a single account. Although this does not alter the strategic tension between the auditor and the manager, it does allow for a more straight-forward analysis of the game and implementation in the laboratory.

Without prior knowledge of the manager’s decisions, the auditor chooses the number of costly audit resources units, \( e_i \), to devote to the audit of each account. The probability that the auditor will detect any existing misstatement in account \( i \), \( p_i \) (the detection probability), is the product of \( e_i \) and an audit effectiveness multiplier, \( T \), which represents the marginal increase in the auditor’s probability of detecting a misstatement for each additional unit of resources devoted to a given account. Although, in practice, this factor likely varies across accounts, for the purposes of this study, \( T \) is set to 1 percent for all accounts. This means that for each additional resource unit devoted to an account, the probability of detecting an existing misstatement increases by one percentage point. Accordingly, if the auditor allocates 100 resource units to account \( i \) (i.e., \( e_i = 100 \)), the detection probability, \( p_i \), is 100 percent. At the opposite extreme, if no resources are devoted to account \( i \) (i.e., \( e_i = 0 \)), there is zero probability of detecting a misstatement associated with that account.

After the manager has chosen whether to override the two accounts and the auditor has allocated his or her resources, audit outcomes are determined randomly based
on those choices and the non-strategic risk of misstatement, \( r_i \). Each player’s payoff depends on these outcomes, as described below.

**Payoffs and the Nash Equilibrium**

The auditor’s total cost of resources is \( \sum e_i K \), where \( K \) is the auditor’s cost per unit of resource. Consistent with King (2002), the total amount of resources devoted to auditing the two accounts is exogenously limited by an audit fee, \( FK \). In other words, \( FK \geq \sum e_i K \). Any resources that are not allocated to the audit are consumed by the auditor. In addition to the utility garnered from unused resources, the auditor receives utility of \( Y \) for each account for completing the audit.\(^5\) When undetected misstatements occur, the auditor also incurs a penalty, \( Z \), which does not depend on whether the undetected misstatement was intentional or unintentional.

For each account, if the manager accepts the balance generated by the accounting system, his or her payoff is \( M_L \) when a misstatement does not occur or when a misstatement does occur but is not detected. When a misstatement is detected, the manager’s payoff is \( M_L - V_L \). On the other hand, when the manager overrides the accounting system, he or she receives \( M_H \) when the auditor does not detect the resulting intentional misstatement and \( M_H - V_H \) when that misstatement is detected. Consistent with the reasoning of prior research, I assume that the financial reporting manager prefers to override the accounting system when misstatements will not be detected, but prefers to accept the system’s output when misstatements will be detected. That is, \( M_H > M_L \), but \( M_H - V_H < M_L - V_L \).

\(^5\) Although the value of \( Y \) does not affect the equilibrium solution to the audit game (as derived in the Appendix), a sufficiently high value of \( Y \) serves the practical purpose of ensuring non-negative payoffs to experimental participants. Therefore, for consistency, I include it in the auditor’s utility function here.
Solving for the equilibrium gives $e_i^* = \frac{K - Zr_i T}{T(Z - Zr_i)}$ and $e_i^* = \frac{M_H - M_L}{T(V_H - r_i V_L)}$ as derived in the Appendix. Consistent with the logic of a mixed strategy equilibrium (Fudenberg and Tirole 1991), the auditor’s (manager’s) optimal strategy is a function of the manager’s (auditor’s) payoff structure and the account-specific non-strategic risk, $r_i$, but does not depend on his or her own payoffs. Additionally, the equilibrium is unaffected by the auditor’s fee, $F$. However, I do assume that the amount of resources available to the auditor is sufficient to provide an equilibrium level of resources to both accounts. If resources were constrained to lower levels, the auditor would always allocate below-equilibrium resources to, at least, one account. This would result in corner solutions, where the manager always overrides at least one of the accounts. Assuming a sufficient level of available resources allows me to focus on the more interesting circumstances with interior solutions.

Table 1 summarizes the game parameters, which are intended to capture the real-world preferences of both the auditor and manager. Note that the two accounts in this game differ only in the non-strategic risk parameter, $r_i$, which is set at 20 percent and 80 percent for Account 1 (the low-risk account) and Account 2 (the high-risk account), respectively. Accordingly, the equilibrium is approximately $(e_1^*, e_2^*, q_1^*, q_2^*) = (48, 52, .75, 0)$ for both resource conditions.

Under this parameterization of the game, the combination of the non-strategic risk of error and the strategic risk of fraud results in an equilibrium misstatement risk of 80 percent for each account regardless of the non-strategic risk. Therefore, the auditor will
allocate similar amounts of resources to the two accounts, even though an unintentional misstatement is substantially more likely to occur in Account 2 versus Account 1.

Although the equilibrium probability of misstatement is the same for both accounts, the auditor does allocate slightly more resources to the high-risk account in equilibrium. This occurs because the manager is penalized when an unintentional misstatement is detected. Since the manager cannot control the quality of the accounting system in this setting, this penalty for unintentional misstatements reduces the marginal disincentive of the penalty for detected override. Therefore, as the quality of the accounting system decreases (i.e., as the non-strategic risk increases), the auditor allocates more resources to the high-risk account although the equilibrium level of risk remains unchanged. Though, in practice, equilibrium allocations of auditor effort could be more sharply skewed towards the high-risk account, the equilibrium in this setting strengthens the ability of an experiment to test the theoretical premise that endogenous management reporting can offset differences in non-strategic risk.

This model incorporates a number of simplifying assumptions that facilitate implementation in the laboratory. First, although this game is meant to represent a fraud setting, the manager does not issue an accounting report on which the auditor opines, but instead chooses a hidden action (whether to override the accounting system), which, in the analytic literature, is more often associated with misappropriation of firm assets rather than misreporting (Newman et al. 1996). Second, consistent with Anderson and Young (1988) but contrary to Newman et al. (1996), I assume that there are no interdependencies between the two audited accounts. That is, detecting a misstatement in one account does not make a misstatement in the other account more likely to be detected. Third, I assume
that the auditor’s penalty for undetected misstatements does not differ depending on
whether or not the misstatement is intentional. While, in practice, those penalties may
differ, that difference would not affect the equilibrium predictions regarding auditor
behavior. Game theory would predict that increasing the auditor’s penalty for undetected
fraud, while holding constant the penalty for undetected errors, would result in a lower
likelihood of fraud. However, the manager would continue to override accounts with
lower non-strategic risk more often than those with higher non-strategic risk except as
auditor penalties approach infinity. Finally, this model treats the audit as a one-shot
game, though, in practice, the same auditor and manager may interact repeatedly over the
course of their relationship, allowing each party to learn about the other’s behavior. A
multi-period Bayesian analysis of the game could provide further analytic insights and
predictions about auditor and manager behavior. However, although each of these
assumptions has important implications for predicted behavior, the purpose of this model
is not to form precise predictions about auditor and manager behavior, per se, but rather
to capture, in a multi-account setting, the strategic nature of the auditor-manager
relationship and to allow a clear examination of auditor resource allocation strategies,
manager responses and the potential benefits of a strategic prompt in such settings.

III. Hypotheses

Effect of Non-strategic Risk

The theoretic equilibrium solution to the multi-account audit game described in
section II is calculated under the assumption that both the auditor and the manager are
each able to anticipate the other’s strategy and to respond optimally. However, people
often exhibit low levels of the strategic reasoning necessary to do so (e.g., Ochs 1995; Bloomfield 1997; Zimbelman and Waller 1999; Wilks and Zimbelman 2004; Fischbacher and Stefani 2007; Bowlin et al. 2009), and instead adopt intuitive decision rules when faced with cognitively challenging problems (Tversky and Kahneman 1986). Adoption of intuitive decision rules are likely in the multi-account audit game due to the cognitive complexity of calculating the game’s mixed strategy equilibrium. Further, since the only observable difference between the two accounts in this setting is the non-strategic risk of misstatement, that risk will likely provide a salient focal point (Sugden 1995) upon which the auditor will construct an intuitive allocation strategy, directing substantially fewer resources to the low-risk account than the high-risk account contrary to the game theoretic prediction.

**H1:** Auditors will allocate a smaller percentage of resources to the low-risk account than to the high-risk account.

**Manager Behavior**

Allocating significantly more resources to the high-risk account, as predicted by H1, would be reasonable if managers do not anticipate or respond to that strategy, but such an allocation is ineffective if managers are strategic and do respond according to standard economic predictions. The game theoretic model in Section II predicts that the manager will anticipate the audit strategy predicted in H1 and that he or she will respond by overriding the low-risk account with a greater probability (75%) than the high-risk account (0%).

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6 Wilks and Zimbelman (2004) define the auditor’s strategic reasoning as the ability to anticipate the financial reporting manager’s response to the auditor’s strategy.
Consistent with the model’s game-theoretic reasoning, I predict that managers in this study will override the low-risk account significantly more often than the high-risk account. To the extent the manager does not initially anticipate that the auditor will allocate more resources to the low-risk account than the high-risk account, the feedback he or she receives through adoption of a testing strategy (Bowlin et al. 2009) will likely indicate that overriding the high-risk account is detected by the auditor much more often than overriding the low-risk account. Therefore, feedback will likely further encourage the following predicted behavior:

**H2:** Managers will override the low-risk account more often than the high-risk account.

**Strategic Reasoning and the Effect of Strategic Prompts**

Prior economics and accounting research has modeled strategic reasoning as a hierarchy of beliefs (e.g., Stahl and Wilson 1995; Zimbelman and Waller 1999; Camerer et al. 2004; Hoffman and Zimbelman 2009), in which strategic reasoning is categorized in levels according to the players’ conjectures about their opponents’ beliefs and likely behavior. Following Stahl and Wilson’s (1995) model and terminology, Level-0 players make no assumptions about other players and, therefore, haphazardly choose from available strategies. Players with Level-1 beliefs assume that all other players are Level-0 types. Since these Level-1 players assume their opponents make choices haphazardly, Level-1 players in mixed strategy games, such as my audit game, are likely to be responsive to components of their own utility functions. Level-2 players believe that all other players are a mixture of Level-0 and Level-1 players (Stahl and Wilson 1995;  

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7 The behavior predicted in H1 is consistent with Level-1 beliefs.
Camerer et al. 2004). Therefore, these players are more likely to be responsive to their opponents’ utility functions, making them more strategically sophisticated.

While prior research demonstrates that people typically attain low levels of this strategic reasoning (Zimbelman and Waller 1999; Camerer et al. 2004; Ochs 1995; Fischbacher and Stefani 2007; Bowlin et al. 2009), few studies have tested interventions intended to raise the level of strategic reasoning. Hoffman and Zimbelman (2009) provide an important exception by examining the use of strategic prompts within the auditing literature. In their study, professional auditors are asked to suggest modifications to a standard audit program after reviewing case information based on an actual fraud event. Before making these recommendations, participants in the strategic condition are required to explain how management might commit fraud using the accounts receivable and how management might conceal that fraud if management is able to anticipate the auditor’s standard procedures. The authors find that auditors receiving this prompt recommend audit procedures that are more consistent with procedures suggested by a panel of expert auditors.

My study builds on Hoffman and Zimbelman (2009) in important ways regarding the use of strategic prompts. First, their study is not interactive, meaning that the managers, who may anticipate audit strategies, are hypothetical. Therefore, their study cannot explore whether managers do anticipate and respond to the auditors’ basic audit programs or whether they might further anticipate and respond to the auditors’ proposed modifications of those programs. An interactive setting like mine allows one to demonstrate the need for enhanced strategic reasoning via examination of the strategic outcomes of the audit game. Second, Hoffman and Zimbelman (2009) consider a single-
account setting where the risk of fraud is already known to be high. My study, on the other hand, takes a step back and examines the efficacy of a strategic prompt in improving the assessments of, and responses to, misstatement risk, which Hoffman and Zimbelman (2009) take as given.

A small number of prior studies in economics do examine the effects of strategic prompts in interactive settings (e.g., Ortmann et al. 2000; Croson 2000; and Costa-Gomes and Weizsäcker 2006), but the results of those studies have been mixed. For example, in public goods and prisoner’s dilemma games, Croson (2000) finds that players are more likely to choose the dominant equilibrium strategies of free-riding in the public goods game and defection in the prisoner’s dilemma game when players are required to make guesses about their opponents’ strategies.

In a study by Costa-Gomes and Weizsäcker (2008), participants play a series of one-shot 3×3 normal form games during which outcome feedback is suppressed. The authors find that participant choices are not affected by whether they are required to state beliefs about their opponents’ choices before they choose their own strategies and, further, that participants do not seem to respond to their own stated beliefs about their opponents’ behavior. Similarly, Ortmann et al. (2000) find that, in a standard trust game, sender investment is not affected when senders are prompted to predict how much of firm product will be returned to them by the receivers.8

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8 In a trust game, a sender receives an endowment and chooses the portion of the endowment to invest with a receiver. The amount invested is multiplied and the receiver then chooses a portion of the product to return to the sender. Game theory predicts that the receiver would choose to maximize his or her profit by keeping the entire product and that the sender will, therefore, not invest any of his or her endowment. However, contrary to these economic predictions, prior experimental studies find that senders often invest at least part of the endowment and that receivers often return some of the product to the senders (e.g., Berg and McCabe 1995).
One possible explanation for the mixture of results could be the differences in the strategic complexity of the games played within these studies. Specifically, in public goods and prisoner dilemma games, each player’s optimal strategy is to defect regardless of the opponent’s choices. In such strategically simple games, a strategic prompt will likely highlight each player’s dominant strategy making the play of such strategies more likely. However, the prompt may not always be as effective in more strategically complex games like the trust game in Ortmann et al. (2000) and the normal form games in Costa-Gomez and Weizacker (2008), where each player’s optimum strategy depends on the opponent’s chosen strategy. This is because, even when prompted to consider other players’ strategies, it may be difficult to predict their choices or to calculate appropriate responses based on those predictions.

Though an audit may be characterized as a type of mixed strategy game (Fischbacher and Stefani 2008 and Bowlin et al. 2009), which is highly strategically complex (Bloomfield 1995), a strategic prompt is likely to be more effective in my audit setting than in games considered by Ortmann et al. (2000) and Costa-Gomez and Weisacker (2008) because judgments about risk and others’ behavior are likely to be made by contrasting the two accounts rather than evaluating each one independently (Bhattacharjee et al. 2007). While it may be difficult for a client manager to predict the absolute amount of resources an auditor will devote to the low-risk account, the manager will likely predict that fewer resources will be devoted to low-risk accounts compared to high-risk accounts. This difference in non-strategic risk may similarly aid the auditors in predicting and responding to manager behavior when they are prompted to do so. That is, the same relative assessments of non-strategic risk that provide a focal point for the
intuitive allocation strategy predicted in H1 will also help prompted auditors recognize that client managers are likely to believe auditors will focus fewer resources on low-risk accounts and are more likely, then, to misreport those accounts. With this understanding, these prompted auditors are likely to devote more resources to low-risk accounts than would unprompted auditors.

**H3a:** Auditors receiving the strategic prompt will allocate more resources to the low-risk account than auditors not receiving such a prompt.

If the prompt does indeed enhance auditors’ sensitivity to the strategic risk of fraud, they will recognize that managers are more likely to override the low-risk account than the high-risk account. In accordance with this understanding, auditors receiving the strategic prompt will likely allocate more resources to the low-risk account, but those auditors are not as likely to also allocate more resources to the high-risk account. In other words:

**H3b:** The strategic prompt will have a more pronounced positive effect on the level of resources allocated to the low-risk account than to the high-risk account.

**Effect of Resource Availability**

Prior research suggests that the way in which auditors perceive and respond to risk could depend on the degree to which audit resources are constrained (Glover 1997; Houston 1999). Tight constraints on resources are likely to induce constraint stress, which occurs when one feels that he or she is externally prevented from doing what is desired or necessary (Schuler 1980). Prior auditing research indicates that when auditors
face constraint stress, they often respond by mentally filtering away information that seems less relevant to the judgment at hand (e.g., Glover 1997; Asare et al. 2000).⁹

When auditors in strategic settings are faced with tightly constrained resources, they may similarly respond by filtering away information that seems less relevant to the required judgments. However, in the setting described in Section II, the information that seems less relevant would likely be the information about the managers’ incentives and potential strategic behavior, the use of which is likely to seem more ambiguous and less obvious than the information about non-strategic risk which clearly differs between accounts. Contrary to auditors under the no prompt condition, who are less likely to comprehend the strategic implications of the game, auditors under the prompt condition are likely to recognize the strategic nature of the game, but they may filter that information when making the allocation decision if resources are more tightly constrained. Auditors with excess resources are less likely to suffer from constraint stress and, therefore, may be less likely to filter strategic information. Consequently, the strategic prompt could be more effective under the excess resources condition than in the adequate resources condition.

On the other hand, the opposite prediction is not unreasonable. For example, economics research has shown that introducing excess cash into a market can result in large price bubbles even when fundamental value is well-known (Caginalp et al. 2001). Similarly, when auditors have access to excess resources, they could avoid cognitively

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⁹ Glover (1997) finds that auditors filter less relevant information when they face time limits during the conduct of substantive audit procedures. Asare et al. (2000) extends Glover (1997) by operationalizing time pressure with constrained budgets rather than time limits. They find evidence suggesting that, during the planning phase, auditors similarly filter information when choosing which audit procedures under tighter time budget constraints. My resource manipulation is analogous to Asare et al.’s (2000) budget manipulation.
challenging allocation decisions by devoting large amounts of resources to both accounts (relative to the equilibrium) and still retain some resources as profit. Under these circumstances, auditors may not attune as closely to the differences in risk between the two accounts. If this is true, then having greater resources could make a prompt less effective.

These two lines of reasoning support predictions of two potential, and opposite, ordinal interactions between the prompt and resource variables and suggest that the effect of the strategic prompt may not be robust across differing levels of available audit resources. That said, however, it is unclear which of these two possible effects will dominate or whether both effects may operate simultaneously within a population. Therefore, I state the fourth hypothesis in the null form:

**H4:** The effect of the strategic prompt on the amount of resources allocated to the low-risk account will not differ between the adequate and excess resources conditions.

### IV. Experimental Method

**Environment and Procedures**

The experiment was conducted in a controlled laboratory environment with 132 volunteer upper-division accounting students as participants. Prior to beginning the experiment, participants were provided with written instructions that were read aloud by the experimenter. The instructions explained that each player would be anonymously assigned to one of two player types, a “Chooser” (analog to an financial reporting manager) or a “Guesser” (analog to an auditor), and that each Chooser would be paired
with one Guesser for 20 rounds of the audit game described in Section II.\textsuperscript{10} The
instructions familiarized participants with the setting of the game, the choices to be made
by each player type, and their respective payoffs for each of the possible game outcomes.

To enhance comprehension, the instructions characterized the game as a
production process with two machines (analog to the accounting system) that each
deposit 100 marbles into its output bin. Of the 100 marbles placed in each bin, one will
be an odd color (analog to a misstatement) if the Chooser overrides the machine or if the
machine places an odd-colored marble in its bin by chance. The instructions explained
that the Guesser may search for odd-colored marbles by specifying the number of
marbles to be drawn from each bin up to a maximum total of 101 and 181 marbles in the
adequate and excess resource conditions, respectively.

The game was implemented using z-Tree software (Fischbacher 2007) on
networked laboratory computers. After the experimenter finished reading the
instructions, participants received supplemental instructions via z-Tree, which
summarized the paper-based instructions and, for auditors in the prompt condition, also
described the strategic prompt. After reading these supplemental instructions,
participants took a true-or-false quiz to help ensure their understanding of the
instructions.\textsuperscript{11}

When all participants had completed the quiz, the computer began the first round
of the game described above. In all conditions, the managers chose whether to override

\textsuperscript{10} Although the player labels were intended to reduce potential demand effects, the “guesser” label could
potentially suggest that participants in that role should allocate resources at random. However, results
reported in Section V suggest that this is not the case. Additionally, in their responses to open-ended post-
experimental questions about their decision-making, nearly all participants describe allocation strategies
that are more sophisticated than a simple guessing strategy.

\textsuperscript{11} To help ensure that the instructions were understood, when a participant answered a question incorrectly,
z-Tree provided an explanation of the relevant portion of the instructions. The participant then answered
that question again before moving on to the next question.
each of the two accounts and the auditors chose how their resources would be allocated to each account and how much would remain unallocated. However, before making their allocation decisions, auditors in the prompt condition responded to two belief-elicitation questions that made up the strategic prompt described in more detail in below. When all decisions had been entered, the computer randomly generated outcomes conditional on participant choices and the account-specific non-strategic risk. The computer then awarded points according to the parameters in Table 1. After receiving feedback reports, the game was repeated as described above for another 19 rounds.

**Feedback and Compensation**

After the computer determined the outcomes at the end of each round, each participant received feedback for each account. The auditor’s feedback only reported his or her own allocation choice and whether he or she had detected a misstatement. If no misstatement was detected, the auditor was not informed about whether a misstatement had occurred but had been undetected. Similarly, the manager’s feedback reported his or her own choices and whether a misstatement had been detected but did not report the amount of audit resources devoted to each account. The incomplete nature of this feedback reflects an institutional reality that auditors cannot know with certainty that an account balance is correctly stated unless that account is fully audited (Anderson and Young 1988) and managers cannot know with certainty the auditor’s overall level of effort or how the auditor allocates his or her resources (Bowlin et al. 2009).

Note that the auditor only learned whether he or she detected a misstatement and not whether a detected misstatement occurred by chance or due to manager override. This is consistent with Statement on Auditing Standards No. 99 (SAS 99), which
suggests that auditors may have difficulty determining whether a detected misstatement is intentional or unintentional (AICPA 2002, footnote 4).

Consistent with the tenets of experimental economics, participants were privately compensated at the end of each session. Participants received a show-up fee of $5.00 plus 6 cents per point earned. The average participant earned approximately $28 for sessions lasting no more than ninety minutes.

**Manipulation**

In order for an auditor to choose an effective and efficient allocation strategy, his or her understanding of the audit should include the possibility that the manager will anticipate and attempt to exploit the resource allocation predicted in H1. However, a prompt that simply asks the auditor to predict the manager’s strategy may not sufficiently enhance the auditor’s understanding of managerial incentives. To the extent that auditors naturally engage in Level-1 reasoning, a prompt that merely elicits the auditor’s beliefs about the manager’s likely choice might only elicit Level-1 priors (that the manager will behave randomly).

Therefore, I test a stronger strategic prompt that begins by asking an auditor to predict the manager’s beliefs about the auditor’s allocation strategy and then further asks the auditor to predict the manager’s response to those beliefs. Eliciting both types of beliefs is more likely to help auditors develop a strategically sophisticated understanding of the audit environment.

Accordingly, at the beginning of each round, auditors in the prompt condition were required to state their beliefs about the managers’ expectations of, and likely responses to, auditors’ resource allocations prior to specifying the amount of resources to
be allocated to each account. Specifically, and continuing the marble and bin analogy, each auditor in the prompt condition entered his or her beliefs about the number of marbles the manager expected the auditor to draw from each bin. Then, using a Likert scale, the auditor entered his or her beliefs about the likelihood that the manager would override each machine. To maintain *ceteris paribus* conditions, the managers were not made aware of this prompt and auditor compensation was not dependent on their responses to it.\(^{12}\)

The level of resources was also manipulated between subjects. Continuing the marble and bin analogy, auditors in the adequate resources condition could draw up to 101 of the 200 total marbles in the two bins, which is sufficient to play the equilibrium strategy described in Section II, which suggests that approximately 48 and 52 marbles will be drawn from the high-risk and low-risk bins, respectively. However, auditors in the excess resources condition could draw as many as 181 marbles from the two bins. The level of resources available to the auditor was common information to both auditors and managers.

\(^{12}\) Not compensating auditors based on their responses to the prompt has the added benefit of maintaining the incentive dominance of the auditors’ resource allocation decisions.
chose to override that account. Panels A, B, and C of Table 2 summarize the mean number of resource units that auditors utilize in total and specifically devote to the low-risk and high-risk accounts, respectively, while Panels A and B of Tables 5 summarizes manager behavior under each experimental condition.13

Preliminary Analysis of Auditor Behavior

Panel A of Table 2 indicates that more resources are utilized when auditors receive the strategic prompt and when higher levels of resources are available. Pooling across resource conditions, auditors utilize a mean of 110.0 resource units when they receive the prompt but only use an average of 98.6 units when they are not prompted. In addition, auditors utilize 122.5 resource units in the excess resources condition, but only utilize an average of 84.7 units in the adequate resources condition.

Table 3 presents a three-factor, repeated-measures ANOVA on audit resource allocations with two between-subjects main effects (PROMPT and RESOURCES) and one within-subjects main effect (ACCOUNT) as well as all interaction effects. This ANOVA provides an omnibus test of the overall effects of RESOURCES and PROMPT across both the high-risk and low-risk accounts. The significant main effects of PROMPT ($t_{62} = 1.87$, one-sided $p = .033$) and RESOURCES ($p < .001$, Table 3) suggest that both prompting auditors to consider the strategic nature of the audit and making more

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13 Levene tests for equality of variance (Levene 1957) suggest that there is significant heterogeneity among the cell variances reported in Panels A and B of Table 2. This heterogeneity can be reduced by converting the data to ranks (Kachelmieier and Messier Jr 1990). However, inferences based on the analysis of rank-transformed data do not qualitatively differ from inferences based on the analysis of raw data. Therefore, for consistency across analyses, the results discussed in the following sections are based on the raw data.
resources available to the auditor result in the utilization of more of audit resources overall.

**Effect of Non-strategic Risk (H1)**

Recall that H1 predicts that auditors will allocate more resources to the high-risk account relative to the low-risk account. Consistent with H1, results tabulated in Panels B and C of Table 2 show that more resources are allocated to the high-risk account than the low-risk account under all treatments. Pooling across prompt conditions in the excess resources condition, auditors allocate, on average, 68.8 and 53.7 resource units to the high- and low-risk accounts, respectively. Similarly, in the adequate resources condition auditors allocate 55.4 units to the high-risk account and 29.2 to the low-risk account. A significant main effect of ACCOUNT (p < .001, Table 3) in the omnibus ANOVA confirms that the overall difference in the amount of resources devoted to the high-risk account relative to the low-risk account is significant and provides support for H1.

**Manager Behavior (H2)**

Consistent with H2 and as tabulated in Table 5, managers choose to override the low-risk account more often than the high-risk account under both prompt conditions. Managers under the adequate resources condition choose to override the low-risk account 67.4 percent of the time, while overriding the high-risk account 47.6 percent of the time. Similarly, under the excess resources condition, managers choose to override the low-risk and high-risk accounts 49.9 percent and 35.1 percent of the time, respectively. A significant main effect of ACCOUNT (t_{62} = 4.62, one-sided p < .001) in the three-factor, repeated-measures ANOVA reported in Table 6 indicates that, overall, managers override the low-risk account more often than the high-risk account, suggesting that managers are
responsive to the auditors’ strategies of allocating larger amounts of resources to the high-risk account than the low-risk account.

[INSERT TABLES 5 ABOUT HERE]

[INSERT TABLE 6 ABOUT HERE]

I further explore manager behavior through logistic regression of manager override decisions on ACCOUNT, PROMPT, RESOURCES and an experience variable (ROUND) along with all possible interactions.\textsuperscript{14} None of the main effects of ACCOUNT, PROMPT and RESOURCES is significant. However, both the ACCOUNT×ROUND and RESOURCES×ROUND interactions in Table 7 are positive and significant (p < .001 and p = .004, respectively). These results, along with non-significant three- and four-way interactions, suggest that, rather than occurring immediately, the manager sensitivity to ACCOUNT and RESOURCES documented above develops with experience. Specifically, as participants in the manager role gain experience they become increasingly more likely to override the low-risk account than the high-risk account. Similarly, compared to managers in the excess resources condition, managers in the adequate resources condition become more likely to override accounts, in general, as they gain experience.

**Effect of Strategic Prompt (H3a and H3b)**

Because auditors tend to allocate relatively few resources to the low-risk account and because client managers exploit this behavior, an effective strategic prompt would result in additional resources being devoted particularly to the low-risk account.

\textsuperscript{14} In the logistic regression model, ACCOUNT is coded as 0 and 1 for the high- and low-risk accounts, respectively, PROMPT is coded as 0 and 1 for the no prompt and prompt conditions, respectively, and RESOURCES is coded as 0 and 1 for the excess and adequate resource conditions, respectively. The dependent variable is coded as 0 when the manager does not override the account and as 1 when an override does occur.
Accordingly, H3a focuses on the prompt’s specific effect on the amount of resources devoted to the low-risk account and predicts that auditors receiving the prompt will devote more resources to the low-risk account than auditors who do not receive the prompt.

Although the repeated-measures ANOVA in Table 3 suggests that the overall utilization of audit resources is affected by the strategic prompt, this omnibus analysis is not capable of testing the prompt’s specific effect on the amount of resources allocated to the low-risk account. Therefore, in Table 4, Panel A, I separately analyze resource allocations to the low-risk account in a 2×2 ANOVA that crosses PROMPT with RESOURCES. Within the adequate (excess) resources condition, auditors not receiving the prompt devote a mean of 24.3 (46.5) resource units to the low-risk account, while auditors receiving the strategic prompt allocate a mean of 33.3 (61.3) units to that account. The ANOVA main effect reported in Table 4, Panel A indicates that this difference is statistically significant (t\textsubscript{62} = 2.18, one-sided p = .016), providing support for H3a.  

\[\text{[INSERT TABLE 4 ABOUT HERE]}\]

Theory suggests that when auditors receive the strategic prompt, they will be more likely to recognize that managers will anticipate that fewer resources will be allocated to the low-risk account than to the high-risk account and that managers may, therefore, view the low-risk account as a particularly attractive opportunity for fraud. Therefore, a prompt that enhances an auditor’s sensitivity to the strategic risk of fraud is

\footnote{\textsuperscript{15} An untabulated regression of the amount of resources allocated to the low risk account during the last ten rounds of the game on PROMPT, RESOURCES and the detection of manager override during the first 10 rounds indicates a positive relationship between allocations to the low-risk account and previously detected override behavior. However, this learning does not appear to moderate the effects of PROMPT or RESOURCES on resources allocated to the low-risk account.}
expected to cause an increase in the amount of resources devoted specifically to the low-risk account rather than just a general increase in resource usage, which, while improving effectiveness, would do so with the cost of reduced efficiency. Finding that the prompt increases audit resources devoted to the low risk account without a similar increase in attention to the high risk account would support the underlying argument that a strategic prompt enhances auditors’ strategic understanding of the audit and of misstatement risk rather than simply prompting a general deployment of additional resources.16

The ACCOUNT×PROMPT interaction effect in Table 3 provides a direct test of the relative effects of the strategic prompt on allocations of resources to the high- and low-risk accounts (H3b). While Table 3 documents that this interaction is marginally significant ($t_{62} = 1.32$, one-sided $p = .096$),17 separate analyses of the high- and low-risk accounts provide further evidence that the additional resources used under the PROMPT condition are allocated in a manner consistent with an enhanced understanding of the strategic nature of misstatement risk. As noted above, the 2×2 ANOVA in Panel A of Table 4 indicates that the increase in resources allocated to the low-risk account under the prompt condition is significant ($t_{62} = 2.18$, one-sided $p = .016$). However, PROMPT’s effect on the amount of resources allocated to the high-risk account is not significant ($p = .658$, Table 4, Panel B). These results suggest that the prompt enhances auditor sensitivity to the strategic risk of fraud and consequently improves the effectiveness of auditor resource allocations without diminishing the efficiency of them.

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16 Since participants were not compensated based on the quality or accuracy of their responses to the strategic prompt, those responses may not reliably report their true beliefs while nevertheless enhancing strategic understanding of the audit setting. In fact, analyses of those responses discern few relationships among them aside from a positive correlation between auditors’ beliefs about the number of resource units managers expect auditors to allocate to each and the amount of resources auditors actually allocate to each account.

17 McNeil et al. (1996, pp. 137–139) discuss the rationale for one-tailed tests of directionally predicted interactions.
Supplemental Analysis of Undetected Misstatements

Further support for the premise that the prompt has a more pronounced effect on strategic audit outcomes in the low-risk account is found by comparing the number of undetected misstatements occurring within each treatment, particularly the number of undetected misstatements occurring in later rounds. Recall the results of the logistic regression of manager override behavior in Table 7 and notice that the coefficient on the ACCOUNT×PROMPT×ROUND interaction term is negative and marginally significant (p = 0.098, Table 7), implying that over time the strategic prompt is associated with a growing downward pressure on managers’ tendencies to override the low-risk account versus the high-risk account.

Now, couple this finding with the evidence from above that indicates auditors in the prompt condition allocate more resources to the low-risk account than unprompted auditors but no more resources to the high-risk account. Jointly, these findings suggest that, especially in later rounds, the prompt will lead to a more pronounced decrease in the number of undetected misstatements in the low-risk account than in the high-risk account. The results reported in Tables 8 and 9 suggest this pattern of outcomes.

Table 8 summarizes, by treatment, the mean cumulative undetected misstatements that occur during the last ten rounds of the audit game. Note that in both resource conditions, there are fewer undetected misstatements in the low-risk account in the prompt condition than in the no prompt condition. Under adequate (excess) resources, there are a mean of 6.50 and 5.00 (3.78 and 2.12) cumulative undetected misstatements in the no prompt and prompt conditions, respectively. However, there is rather little difference in the number of undetected misstatements in the high-risk account between

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18 Recall that, in this setting, misstatements may occur by chance or due to manager override.
the prompt and no prompt conditions. Specifically, under the adequate (excess) resources
condition, cumulative undetected misstatements in the high-risk account are, on average,
4.07 and 3.94 (2.61 and 2.71) in the no prompt and prompt conditions, respectively. A
significant ACCOUNT×PROMPT interaction (p = 0.048, Table 9) confirms that the
prompt has a more pronounced effect on the number of undetected misstatements in the
low-risk account than in the high-risk account.

[INSERT TABLE 8 ABOUT HERE]

[INSERT TABLE 9 ABOUT HERE]

While these results provide less direct evidence of the prompt’s effect on auditor
strategic reasoning than does the analysis of auditor resource allocations above,
examining the strategic prompt’s effects on the level of undetected misstatements is
nevertheless important in that doing so provides broader insights into prompt’s direct and
indirect effects on strategic behavior and audit outcomes. That is, the prompt’s
association with the downward pressure on the managers’ tendencies to override the low-
risk account is likely due to the managers experiencing the auditors’ prompt-induced
attention to that account.

Also note, in Panels B and C of Table 8, that there are more undetected
misstatements in the low-risk account than the high-risk account in all treatments, except
the prompt-excess resources treatment. The significant main effect of ACCOUNT (p =
.011, Table 9) confirms that, in general, more undetected misstatements occur in the low-
risk account than the high-risk account. This is an important observation for two reasons.
First, it further demonstrates that an auditor’s failure to understand the strategic nature of
an audit may result in a misallocation of resources and more audit failures. Second, since
managers do not fully exploit the auditors’ below equilibrium allocations to the low-risk account by always overriding that account as game theory would predict, it is important to show that the high-risk account is not, in fact, a riskier account, in which case allocating more resources to that account than the low-risk account would be reasonable. Instead, these results indicate that allocating additional resources to the low-risk account is economically preferable in this setting.

**Effect of Resource Availability (H4)**

As discussed in Section III, prior research suggests that the level of resources available to an auditor could potentially moderate the strategic prompt’s effect on resource allocations, though it is unclear whether increasing available resources would increase or decrease the effectiveness of the strategic prompt. However, an insignificant ANOVA interaction term (p = .596, Table 4, Panel A) indicates that the effect of PROMPT on the amount of resources allocated to the low-risk account is robust to the level of resources available to the auditor, providing no basis for rejecting H4.18

Although resource availability does not interact with the strategic prompt to affect the amount of resources allocated to the low-risk account, the main effect of RESOURCES (p < .001, Table 3) indicates that the availability of resources does affect the overall use of them, which is inconsistent with the game theoretic predictions in Section II that the level of available audit resources will not affect auditor strategy. Pooling across prompt conditions, auditors allocate 53.7 resource units to the low-risk account in the excess resources condition, but in the adequate resources condition, auditors devote only 29.2 units to that account. Similarly, for the high-risk account, the

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18 Likewise, Panel B of Table 4 indicates that the amount of resources allocated to the high-risk account is not significantly affected by the interaction of the strategic prompt and resource availability.
resource allocation decreases from 68.8 units under excess resources to 55.4 under adequate resources.

In total, a mean of 122.5 resource units are deployed under the excess resource condition compared to 84.7 units under the adequate resources condition. There are two potential non-exclusive explanations for this overall difference. First, the distribution of total deployed resources may have been drawn from equivalent distributions under both resource conditions with the exception that the distribution is more truncated under the adequate resource condition where observations group at the adequate resources constraint of 101 resource units. Under this explanation, the amount of resources auditors desire to deploy would not affected by resource availability and the frequency with which auditors deploy at least, say, 100 resource units would not differ between resource conditions. Alternatively, making more resources available to the auditor could result in a distributional shift as auditors are able to experiment along a broader range of resources. In this case, one would find that auditors deploy at least 100 resources units more often when more resources are available.

Untabulated analysis supports this alternative explanation. The frequency with which auditors deploy at least 100 total resource units is greater under the excess resources condition than the adequate resources condition (75.6% compared to 52.3%, respectively). An ANOVA of the frequency with which auditors use at least 100 resource units on PROMPT and RESOURCES indicates that this difference is significant ($F_{1,62} = 10.15, p = 0.002$) and suggests that constraining audit resources not only limits the amount of resources available for use but perhaps also constrains the amount of resources the auditors desire to use.
VI. Conclusion

Risk-based auditing is an intuitive audit approach that focuses more resources on accounts deemed to be riskier and fewer resources on accounts viewed as less risky. However, to the extent that auditors focus on non-strategic risks and overlook the strategic risks that arise when managers anticipate risk-based allocations of audit resources, opportunities for fraud may arise among ostensibly low-risk accounts. The purpose of this study is to demonstrate this potential weakness of risk-based auditing and to investigate whether prompting auditors to consider financial reporting managers’ likely expectations of and responses to auditor strategies can enhance auditors’ sensitivity to the strategic risk of fraud.

I conduct a laboratory experiment in which student participants assume the roles of auditors and financial reporting managers and interact in a multi-account audit setting, which reflects the essential strategic tension that exists between real-world auditors and managers. Results indicate that participants in the auditor role fail to appreciate the strategic nature of the multi-account audit game and, therefore, allocate fewer of their available resources to accounts with relatively low non-strategic risk. Participants in the manager role exploit this behavior by overriding this low-risk account with greater frequency than the high-risk account. The behaviors jointly result in more undetected misstatements within the low-risk accounts than the high-risk accounts. However, I further find that prompting auditor-participants to consider their opponents’ expectations of, and responses to, audit resource allocations results in auditor-participants allocating more resources to the low-risk account without a similar change in resources allocated to the high-risk account. This leads, in later rounds of the game, to fewer undetected
misstatements in the low-risk account but no significant change in the number of undetected misstatements in the high-risk account. These results suggest that a strategic prompt may enhance auditor sensitivity to the strategic risk of fraud and thereby improve audit effectiveness without reducing efficiency. Finally, I also find that, although increasing the amount of resources available to the auditor-participants increases the amount of resources used, the relative effect of the strategic prompt is robust across levels of available resources.

These results suggest implications for both audit firms and audit standard-setters including the AICPA’s Auditing Standards Board and the PCAOB. While current auditing standards generally promote risk assessment procedures that are intended to focus auditor attention toward observable factors indicating that certain financial statement accounts are more, and others are less, likely to be misstated (e.g., AICPA 2002; AICPA 2006), the results reported in this study suggest audit procedures that prompt auditors to consider the possibility that financial reporting managers will anticipate and exploit auditor’s risk assessments could result in fewer undetected misstatements. As an example of such a strategic prompt, audit standards or professional guidance could require that audit teams specifically discuss whether there are any client accounts that management would expect auditors to treat as low-risk. If the auditor determines that there are such accounts, standards could require that he or she take the additional step of considering whether management is likely to attempt to exploit the expected lack of auditor attention. If auditors identify such accounts and determine that fraud attempts are sufficiently likely within them, they could then follow Hoffman and Zimbelman (2009) by considering the specific ways in which fraud could be perpetrated.
and concealed within those accounts as well as design procedures to overcome such concealment.

One limitation of this study is that the experimental design does not disentangle the marginal effects of eliciting auditors’ beliefs about managers’ expectations of auditor strategies relative to eliciting auditors’ beliefs about managers’ likely reporting choices. Though a broader purpose of this study is to examine whether strategic prompts, in general, can enhance auditors’ strategic reasoning and sensitivity to fraud risk, disentangling these effects could be important to audit firms and standard-setters as they structure audit standards and guidance.

Consistent with the traditions of experimental economics (Kachelmeier and King 2002), this study attempts to capture the strategic essence of auditing using a relatively stark but tractable setting. As such, I abstract away several institutional features of real-world auditing that may affect auditor and manager choices, and I leave them as potential avenues for future research. For example, the amount of resources available to a real-world auditor is likely to be endogenously determined through negotiation between the auditor and his or her client. Additionally, in my setting, the manager is equally capable of intentionally misstating each financial statement account, though, in practice, certain low-risk accounts may not be as easily manipulated. Finally, I assume that auditor penalties do not differ between undetected fraud and errors, and while this does not impact the economic predictions of auditor behavior, such differences could behaviorally affect auditor sensitivity to the strategic nature of the audit setting.

Regardless of these potential limitations, the broader point remains. That is, as auditors focus resources away from accounts they view as low-risk, opportunities for
fraud grow among those accounts. Without a strategic prompt similar to that tested here, many auditors may fail to appreciate this strategic risk, resulting in a misallocation of audit resources and more undetected misstatements.
APPENDIX

Following is the auditor’s expected utility and the solution for the manager’s equilibrium strategy, \( q_i^* \):

\[
EU_{auditor} = FK - \sum_i e_iK + \sum_i [Yq_ieiT + (Y - Z)q_i(1 - e_iT) + Yr_ieiT(1 - q_i) + (Y - Z)r_i(1 - q_i)(1 - e_iT) + Y(1 - r_i)(1 - q_i)]
\]

\[
\Rightarrow \frac{\partial EU_{auditor}}{\partial e_i} = -K + Zq_iT + Zr_iT - Zr_riT = 0
\]

\[
\Rightarrow q_i^* = \frac{K - Zr_iT}{T(Z - Zr_i)}
\]

Following is the manager’s expected utility and the solution for the auditor’s equilibrium strategy, \( e_i^* \):

\[
EU_{manager} = \sum_i [M_H q_i(1 - e_iT) + (M_H - V_H)q_ieiT + M_L (1 - r_i)(1 - q_i) + M_Lr_i(1 - q_i)(1 - e_iT) + (M_L - V_L)r_ieiT(1 - q_i)]
\]

\[
\Rightarrow \frac{\partial EU_{manager}}{\partial q_i} = M_H - V_H e_iT - M_L + V_Lr_ieiT = 0
\]

\[
\Rightarrow e_i = \frac{M_H - M_L}{T(V_H - V_L r_i)}
\]
where:

\[ F = \text{the total number of resource units available to the auditor} \]
\[ K = \text{the auditor’s marginal utility per unit of unused resources} \]
\[ Y = \text{the auditor’s payoff for a completed audit of account } i \]
\[ Z = \text{the auditor’s penalty for a failed audit of account } i \]
\[ T = \text{the marginal effect per unit of resources on probability of detecting a misstatement in account } i \]
\[ M_{HH} = \text{the manager’s payoff for undetected override in account } i \]
\[ M_{L} = \text{the manager’s payoff for no fraud or undetected error in account } i \]
\[ V_{HH} = \text{the manager’s penalty for a detected override in account } i \]
\[ V_{L} = \text{the manager’s penalty for a detected error in account } i \]
\[ e_i = \text{the number of resource units allocated to the audit of account } i \]
\[ q_i = \text{the probability that the manager will override the account } i \]
\[ r_i = \text{the (exogenous) probability of error in account } i \text{ conditional on no override} \]
References:


Schuler, R. S. 1980. Definition and Conceptualization of Stress in Organizations. 


Table 1
Game Parameters

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<th>Adequate Resources</th>
<th>Excess Resources</th>
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<td><strong>Panel B: Equilibrium Choice Probabilities</strong></td>
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<tr>
<td>$e_{\text{low-risk}}^*$</td>
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Table 2
Auditor Resource Allocations by Treatment

Panel A: Total audit resources utilized
(means with standard deviation in parentheses)

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<th>Prompt</th>
<th>Combined</th>
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<td>115.0</td>
<td>130.8</td>
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<td></td>
<td>(42.6)</td>
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<tr>
<td>n</td>
<td>18</td>
<td>17</td>
<td>35</td>
</tr>
<tr>
<td><strong>Adequate Resources</strong></td>
<td>78.0</td>
<td>90.1</td>
<td>84.7</td>
</tr>
<tr>
<td></td>
<td>(24.9)</td>
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</tr>
<tr>
<td>n</td>
<td>14</td>
<td>17</td>
<td>31</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>98.6</td>
<td>110.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(39.9)</td>
<td>(31.3)</td>
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<tr>
<td>n</td>
<td>32</td>
<td>34</td>
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Panel B: Resources allocated under the adequate resources condition
(means with standard deviation in parentheses)

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<tr>
<td></td>
<td>(23.8)</td>
<td>(14.0)</td>
</tr>
<tr>
<td>n</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td><strong>Low-risk account</strong></td>
<td>24.3</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>(20.0)</td>
<td>(14.1)</td>
</tr>
<tr>
<td>n</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>39.0</td>
<td>45.1</td>
</tr>
<tr>
<td></td>
<td>(26.1)</td>
<td>(18.3)</td>
</tr>
<tr>
<td>n</td>
<td>28</td>
<td>34</td>
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</tbody>
</table>
Table 2, continued
Auditor Resource Allocations by Treatment

Panel C: Resources allocated under the excess resources condition
(means with standard deviation in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-risk account</strong></td>
<td>68.1</td>
<td>69.5</td>
<td>68.8</td>
</tr>
<tr>
<td></td>
<td>(25.2)</td>
<td>(16.6)</td>
<td>(21.1)</td>
</tr>
<tr>
<td></td>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
</tr>
<tr>
<td><strong>Low-risk account</strong></td>
<td>46.5</td>
<td>61.3</td>
<td>53.7</td>
</tr>
<tr>
<td></td>
<td>(26.2)</td>
<td>(24.6)</td>
<td>(26.2)</td>
</tr>
<tr>
<td></td>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>57.4</td>
<td>65.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(27.8)</td>
<td>(21.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n=36</td>
<td>n=34</td>
<td></td>
</tr>
</tbody>
</table>
Table 3
Three-factor Repeated Measures ANOVA on Audit Resource Allocations

<table>
<thead>
<tr>
<th>df</th>
<th>SS</th>
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<th>p-value</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Between-subjects effects:*

- PROMPT 1 1,611 3.49 0.066
- RESOURCES 1 12,262 26.59 <.001
- PROMPT × RESOURCES 1 31 0.07 0.795

*Between-subjects error* 62 28,589

*Within-subjects effects:*

- ACCOUNT 1 13,914 32.32 <.001
- ACCOUNT × PROMPT 1 746 1.73 0.193
- ACCOUNT × RESOURCES 1 1,117 2.59 0.112
- ACCOUNT × PROMPT × RESOURCES 1 118 0.27 0.603

*Within-subjects error* 62 26,695

Dependent variable = Auditor's mean allocation of resource units
ACCOUNT = Dichotomous factor to differentiate between the high-risk and low-risk accounts
PROMPT = Dichotomous factor to differentiate between treatments in which auditors receive the strategic prompt and those in which auditors do not receive the strategic prompt
RESOURCES = Dichotomous factor to differentiate between adequate and excess levels of auditor resources
Table 4
Two-factor ANOVAs on Audit Resource Allocations

<table>
<thead>
<tr>
<th>df</th>
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<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROMPT</td>
<td>1</td>
<td>2,275</td>
<td>4.77</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>1</td>
<td>10,391</td>
<td>21.77</td>
</tr>
<tr>
<td>PROMPT × RESOURCES</td>
<td>1</td>
<td>136</td>
<td>0.28</td>
</tr>
<tr>
<td>Error</td>
<td>62</td>
<td>42010</td>
<td></td>
</tr>
</tbody>
</table>

Panel A: Two-factor ANOVA on resources allocated to low-risk account

Panel B: Two-factor ANOVA on resources allocate to high-risk account

Dependent variable = Auditor's mean allocation of resource units
PROMPT = Dichotomous factor to differentiate between treatments in which auditors receive the strategic prompt and those in which auditors do not receive the strategic prompt
RESOURCES = Dichotomous factor to differentiate between adequate and excess levels of auditor resources
Table 5  
Manager Override Frequency by Treatment

**Panel A: Manager frequency of override under the adequate resources condition**  
*(means with standard deviation in parentheses)*

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-risk Account</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>49.3%</td>
<td>46.2%</td>
<td>47.6%</td>
</tr>
<tr>
<td></td>
<td>(29.3%)</td>
<td>(24.3%)</td>
<td>(26.2%)</td>
</tr>
<tr>
<td></td>
<td>n=14</td>
<td>n=17</td>
<td>n=31</td>
</tr>
<tr>
<td><strong>Low-risk Account</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70.7%</td>
<td>64.7%</td>
<td>67.40%</td>
</tr>
<tr>
<td></td>
<td>(22.4%)</td>
<td>(19.2%)</td>
<td>(20.6%)</td>
</tr>
<tr>
<td></td>
<td>n=14</td>
<td>n=17</td>
<td>n=31</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>60.0%</td>
<td>55.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(27.8%)</td>
<td>(23.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n=28</td>
<td>n=34</td>
<td></td>
</tr>
</tbody>
</table>

**Panel B: Manager frequency of override under the excess resources condition**  
*(means with standard deviation in parentheses)*

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-risk Account</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35.0%</td>
<td>35.3%</td>
<td>35.1%</td>
</tr>
<tr>
<td></td>
<td>(21.2%)</td>
<td>(16.4%)</td>
<td>(18.8%)</td>
</tr>
<tr>
<td></td>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
</tr>
<tr>
<td><strong>Low-risk Account</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51.9%</td>
<td>47.6%</td>
<td>49.9%</td>
</tr>
<tr>
<td></td>
<td>(21.8%)</td>
<td>(22.6%)</td>
<td>(22.0%)</td>
</tr>
<tr>
<td></td>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>43.5%</td>
<td>41.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(22.9%)</td>
<td>(20.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n=36</td>
<td>n=34</td>
<td></td>
</tr>
</tbody>
</table>
Table 6
Three-factor Repeated Measures ANOVA on Manager Override Frequency

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between-subjects effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROMPT</td>
<td>1</td>
<td>0.0352</td>
<td>0.67</td>
<td>0.417</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>1</td>
<td>0.7605</td>
<td>14.40</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>PROMPT × RESOURCES</td>
<td>1</td>
<td>0.0053</td>
<td>0.10</td>
<td>0.751</td>
</tr>
<tr>
<td>Between-subjects error</td>
<td>62</td>
<td>3.2736</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within-subjects effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCOUNT</td>
<td>1</td>
<td>0.9803</td>
<td>21.30</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>ACCOUNT × PROMPT</td>
<td>1</td>
<td>0.0115</td>
<td>0.25</td>
<td>0.619</td>
</tr>
<tr>
<td>ACCOUNT × RESOURCES</td>
<td>1</td>
<td>0.0232</td>
<td>0.50</td>
<td>0.480</td>
</tr>
<tr>
<td>ACCOUNT × PROMPT × RESOURCES</td>
<td>1</td>
<td>0.0006</td>
<td>0.01</td>
<td>0.911</td>
</tr>
<tr>
<td>Within-subjects error</td>
<td>62</td>
<td>2.8536</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable = Manager's percentage frequency of choosing "override"
ACCOUNT = Dichotomous factor to differentiate between the high-risk and low-risk accounts
PROMPT = Dichotomous factor to differentiate between treatments in which auditors receive the strategic prompt and those in which auditors do not receive the strategic prompt
RESOURCES = Dichotomous factor to differentiate between adequate and excess levels of auditor resources
Table 7
Logistic Regression of Manager Override on ACCOUNT, PROMPT, RESOURCES and ROUND

\[ Pr(\text{Override}) = a_1 + a_2\text{ACCOUNT} + a_3\text{PROMPT} + a_4\text{RESOURCES} + a_5\text{ROUND} + a_6\text{ACCOUNT}\times\text{PROMPT} + a_7\text{ACCOUNT}\times\text{RESOURCES} + a_8\text{ACCOUNT}\times\text{ROUND} + a_9\text{PROMPT}\times\text{RESOURCES} + a_{10}\text{PROMPT}\times\text{ROUND} + a_{11}\text{ACCOUNT}\times\text{PROMPT}\times\text{RESOURCES} + a_{12}\text{ACCOUNT}\times\text{PROMPT}\times\text{ROUND} + a_{13}\text{ACCOUNT}\times\text{RESOURCES}\times\text{ROUND} + a_{14}\text{PROMPT}\times\text{RESOURCES}\times\text{ROUND} + a_{15}\text{ACCOUNT}\times\text{PROMPT}\times\text{RESOURCES}\times\text{ROUND} + a_{16}\text{ACCOUNT}\times\text{PROMPT}\times\text{RESOURCES}\times\text{ROUND} \]

<table>
<thead>
<tr>
<th></th>
<th>Coeff</th>
<th>s.e.</th>
<th>Wald $\chi^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.217</td>
<td>0.159</td>
<td>1.855</td>
<td>0.173</td>
</tr>
<tr>
<td>ACCOUNT</td>
<td>-0.003</td>
<td>0.223</td>
<td>0.000</td>
<td>0.991</td>
</tr>
<tr>
<td>PROMPT</td>
<td>-0.031</td>
<td>0.229</td>
<td>0.018</td>
<td>0.893</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>-0.015</td>
<td>0.238</td>
<td>0.004</td>
<td>0.949</td>
</tr>
<tr>
<td>ROUND</td>
<td>-0.039</td>
<td>0.014</td>
<td>8.017</td>
<td>0.005</td>
</tr>
<tr>
<td>ACCOUNT $\times$ PROMPT</td>
<td>0.294</td>
<td>0.319</td>
<td>0.849</td>
<td>0.357</td>
</tr>
<tr>
<td>ACCOUNT $\times$ RESOURCES</td>
<td>0.657</td>
<td>0.340</td>
<td>3.736</td>
<td>0.053</td>
</tr>
<tr>
<td>ACCOUNT $\times$ ROUND</td>
<td>0.066</td>
<td>0.019</td>
<td>12.344</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PROMPT $\times$ RESOURCES</td>
<td>-0.050</td>
<td>0.330</td>
<td>0.023</td>
<td>0.881</td>
</tr>
<tr>
<td>PROMPT $\times$ ROUND</td>
<td>0.004</td>
<td>0.020</td>
<td>0.044</td>
<td>0.834</td>
</tr>
<tr>
<td>RESOURCES $\times$ ROUND</td>
<td>0.058</td>
<td>0.020</td>
<td>8.380</td>
<td>0.004</td>
</tr>
<tr>
<td>ACCOUNT $\times$ PROMPT $\times$ RESOURCES</td>
<td>-0.569</td>
<td>0.469</td>
<td>1.468</td>
<td>0.226</td>
</tr>
<tr>
<td>ACCOUNT $\times$ PROMPT $\times$ ROUND</td>
<td>-0.045</td>
<td>0.027</td>
<td>2.745</td>
<td>0.098</td>
</tr>
<tr>
<td>ACCOUNT $\times$ RESOURCES $\times$ ROUND</td>
<td>-0.041</td>
<td>0.029</td>
<td>1.968</td>
<td>0.161</td>
</tr>
<tr>
<td>PROMPT $\times$ RESOURCES $\times$ ROUND</td>
<td>-0.008</td>
<td>0.028</td>
<td>0.089</td>
<td>0.765</td>
</tr>
<tr>
<td>ACCOUNT $\times$ PROMPT $\times$ RESOURCES $\times$ ROUND</td>
<td>0.057</td>
<td>0.040</td>
<td>2.008</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Dependent variable = Manager override choice, where override is coded as 1 and no override is coded as 0
ACCOUNT = Dichotomous factor to differentiate between high-risk and low-risk accounts, where low-risk is coded as 1 and high-risk is coded as 0
PROMPT = Dichotomous factor to differentiate between between treatments in which auditors receive the strategic prompt and those in which auditors do not receive the strategic prompt, where the prompt condition is coded as 1 and the no prompt condition is coded as 0
RESOURCES = Dichotomous factor to differentiate between adequate and excess levels of auditor resources, where adequate resources is coded as 1 and excess resources is coded as 0
ROUND = Measure of experience equal to the round of game play
Table 8
Cumulative Late-round Undetected Misstatements by Treatment

Panel A: Cumulative late-round undetected misstatements
(means with standard deviation in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excess Resources</strong></td>
<td>6.39</td>
<td>4.82</td>
<td>5.63</td>
</tr>
<tr>
<td></td>
<td>(4.90)</td>
<td>(3.70)</td>
<td>(4.37)</td>
</tr>
<tr>
<td><strong>Adequate Resources</strong></td>
<td>10.57</td>
<td>8.94</td>
<td>9.68</td>
</tr>
<tr>
<td></td>
<td>(4.38)</td>
<td>(2.66)</td>
<td>(3.57)</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>8.22</td>
<td>6.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.07)</td>
<td>(3.80)</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Cumulative late-round undetected misstatements under adequate resources
(means with standard deviation in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-risk account</strong></td>
<td>4.07</td>
<td>3.94</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>(2.79)</td>
<td>(2.11)</td>
<td>(2.39)</td>
</tr>
<tr>
<td><strong>Low-risk account</strong></td>
<td>6.50</td>
<td>5.00</td>
<td>5.68</td>
</tr>
<tr>
<td></td>
<td>(3.16)</td>
<td>(2.09)</td>
<td>(2.69)</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>5.29</td>
<td>4.47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.17)</td>
<td>(2.14)</td>
<td></td>
</tr>
</tbody>
</table>
Table 8, continued
Cumulative Late-round Undetected Misstatements by Treatment

Panel C: Cumulative late-round undetected misstatements under excess resources
(means with standard deviation in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>No Prompt</th>
<th>Prompt</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-risk account</td>
<td>2.61</td>
<td>2.71</td>
<td>2.66</td>
</tr>
<tr>
<td></td>
<td>(2.83)</td>
<td>(1.99)</td>
<td>(2.42)</td>
</tr>
<tr>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
<td></td>
</tr>
<tr>
<td>Low-risk account</td>
<td>3.78</td>
<td>2.12</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>(2.82)</td>
<td>(2.39)</td>
<td>(2.72)</td>
</tr>
<tr>
<td>n=18</td>
<td>n=17</td>
<td>n=35</td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td>3.19</td>
<td>2.41</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.85)</td>
<td>(2.19)</td>
<td></td>
</tr>
<tr>
<td>n=36</td>
<td>n=34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9
Three-factor Repeated Measures ANOVA on Undetected Misstatements

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between-subjects effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROMPT</td>
<td>1</td>
<td>20.87</td>
<td>2.62</td>
<td>0.111</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>1</td>
<td>140.81</td>
<td>17.65</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>PROMPT × RESOURCES</td>
<td>1</td>
<td>0.01</td>
<td>0.00</td>
<td>0.974</td>
</tr>
<tr>
<td>Between-subjects error</td>
<td>62</td>
<td>494.56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Within-subjects effects:** |    |      |      |         |
| ACCOUNT                  | 1  | 33.79| 6.90 | 0.011   |
| ACCOUNT × PROMPT         | 1  | 19.96| 4.08 | 0.048   |
| ACCOUNT × RESOURCES      | 1  | 17.30| 3.53 | 0.065   |
| ACCOUNT × PROMPT × RESOURCES | 1  | 0.30 | 0.06 | 0.804   |
| Within-subjects error    | 62 | 303.49|     |         |

Dependent variable = Session total number of undetected misstatements
ACCOUNT = Dichotomous factor to differentiate between the high-risk and low-risk accounts
PROMPT = Dichotomous factor to differentiate between treatments in which auditors receive the strategic prompt and those in which auditors do not receive the strategic prompt
RESOURCES = Dichotomous factor to differentiate between adequate and excess levels of auditor resources