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Does Investor Selection of Auditors Enhance Auditor Independence?

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ABSTRACT: This paper reports the results of experiments designed to examine whether investor selection of auditors enhances auditor independence. The experimental design enables us to explore the effect on independence of different institutional rules as to who hires and fires auditors and to directly measure independence violations. The results suggest that transferring the power to hire and fire the auditor from managers to investors significantly decreases the proportion of independence violations. Additional analysis suggests that a reduction in independence violations increases the overall economic surplus generated in the markets examined.

Keywords: *auditor independence; auditor objectivity; experimental economics; investor selection.*

Data Availability: *Data are available from the authors.*

I. INTRODUCTION

This paper reports the results of experiments designed to examine whether investor selection of auditors enhances auditor independence. The goal is to investigate in a controlled setting how institutional rules governing the hiring and firing of auditors influence auditor independence. An experimental approach provides two advantages that cannot be duplicated in field settings. The first is that we are able to directly manipulate who hires and fires the auditor to investigate settings that do not currently exist in the field, and the second is that we can observe and measure a direct proxy for auditor independence. The ability to directly measure independence is particularly important in that it is difficult to reliably measure independence using archival data (DeAngelo 1981b; Schuetze 1994; Dopuch et al. 2001). Policy makers can use the findings reported to evaluate alternatives with incentives similar to those examined in this study.

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We explore experimentally the impact of changes in the institutional structure governing the financial dependence between auditors and clients on one component of auditor independence—auditor objectivity.[1] The auditor's financial dependence on the client depends heavily on the client's ability to hire and fire the auditor. As a result, the control over hiring and firing the auditor serves as the core incentive for auditors to maintain or compromise their independence (Saul 1996; O'Connor 2002). The experiments in this paper were designed and conducted before the passage of the Sarbanes-Oxley Act in 2002. Sarbanes-Oxley attempts to move the control over hiring and firing the auditor to the audit committee of the board of directors and to make the audit committee independent of management. In general, Sarbanes-Oxley may be a viable way to implement investor selection of auditors, but our experiments do not test Sarbanes-Oxley's specific institutional approach. Our experiments instead take a first step to finding stronger incentives for auditor independence by examining the impact of investor selection in general on auditor independence. Future research can modify our research design to test specific issues related to the Sarbanes-Oxley Act or other suggested audit committee approaches to hiring and firing the auditor.[2]

Prior to Sarbanes-Oxley, client management exerted significant influence over auditor hiring and firing in the United States despite calls for a greater role for independent audit committees in the selection and retention of auditors (cf., Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees 1999). Many boards of directors were and still are dominated by management, which enables management to influence auditor-related decisions.[3] Critics argue that as a result, management retains significant influence over the hiring and firing of auditors, and that auditors respond to the resulting incentives by advocating client-management preferred accounting policies regardless of the auditor's own objective assessments (O'Connor 2002). This paper explores the potential ramifications of a change in this fundamental institutional feature of auditing on auditor independence using an established research methodology and design.

This paper also is closely linked to earlier independence research. It directly extends previous research examining conditions under which auditors are susceptible to independence violations (Magee and Tseng 1990; Schatzberg and Sevcik 1994; Hackenbrack and Nelson 1996; Salterio and Koonce 1997; Calegari et al. 1998; Mayhew et al. 2001). The current paper extends this research by examining potential institutional changes over the control of the hiring and firing of auditors as a way to reduce the proportion of independence violations.

We find that instituting auditor selection by investors significantly decreases independence violations and, when combined with eliminating the auditor's moral hazard over

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[1] In a strict sense auditor independence and auditor objectivity are not equivalent. Auditor independence refers to the second general standard of auditing that states "independence in mental attitude is to be maintained by the auditor ..." The standard goes on to discuss both appearing independent by remaining free of any obligation to the client, and acting independent by remaining objective (AICPA 1997, AU 220). Objectivity refers to maintaining a lack of bias in both conducting the audit and making audit-related judgments. Objectivity is arguably the most important component of auditor independence because without it financial statement users face increased information risk due to the resulting bias included in the financial statements. The experiments in this paper examine auditor objectivity, but the terms independence and objectivity are used interchangeably throughout.

[2] See also Abdel-khalik (2002).

[3] A recent study documents that 30 percent of audit committees do not even meet two basic independence standards: committee members (1) cannot be former employees, or (2) have business ties with the company beyond their board service (McNamee 2002). This classification understates the number of audit committees that do not operate independently of management in that it omits consideration of various grey-area directorships.

effort, almost completely eliminates independence violations.[4] We then show that reducing independence violations increases the surplus in the markets, resulting in a higher level of economic efficiency. Therefore, reducing independence violations can have real consequences to the overall market. Our results suggest that placing control over the hiring and firing of auditors in the hands of a party separate from client management can substantially improve auditor independence.

Section II motivates our experiments by outlining the independence debate that has taken place during the last 25 years and presents our hypothesis. The following sections describe the experimental design and treatments and present the results. Section V then presents and investigates the implications of increased independence on the overall market by separately examining the behavior of auditors, investors, and managers. Section VI discusses the implications of our findings for the current independence debate as well as the limitations of our study.

II. MOTIVATION AND HYPOTHESIS

Former SEC Chairman Arthur Levitt instigated renewed evaluation of auditor independence in 1998 (Levitt 1998, 2000) that led to the SEC issuing new independence rules and disclosure requirements in November 2000 (SEC 2000). Shortly after the new rules took effect, the collapse of Enron in late 2001 raised additional questions about auditor independence. These questions resulted in a new series of proposals for monitoring and disciplining auditors in both the U.S. House of Representatives (2002, HR 3763) and the U.S. Senate (2002a, S. 1896; 2002b, S. 2673) that ultimately led to the passage of the Sarbanes-Oxley Act in 2002.

Questions about auditor independence are not new (Previts 1998). In the last 25 years, concerns have arisen repeatedly, starting with the Metcalf Committee (U.S. Senate 1977) and Cohen Commission (AICPA 1978) in the late 1970s, again in the 1980s with the collapse of the Savings and Loan industry (U.S. House of Representatives Committee on Energy and Commerce 1985), through the 1990s with the litigation reform debate and the explosion in consulting fees paid to auditors (AICPA 1993; Advisory Panel on Auditor Independence 1994; Schuetze 1994; Wallman 1996; Saul 1996; Panel on Audit Effectiveness 2000), and finally in 2001 with the collapse of Enron. Despite a number of different proposals and changes in auditor oversight and self-regulation, the issue of auditor independence continues to arise.

Nearly every independence debate has centered on the concern that auditors may evolve into client advocates.[5] Though client advocacy is not a problem for most professional service firms, and in fact is often seen as a virtue, it can be an enormous problem for audit firms. The problem stems from a lack of clarity about for whom the audit firm truly works. Is it the investing public as intended in the Securities Acts of 1933 and 1934 and reaffirmed by the Supreme Court?[6] Or is it the firm the auditor audits? The most recent debate has been sparked by the rise in consulting fees that can increase an auditor's financial dependence on a client. However, we do not need a rise in consulting fees to motivate client

[4] Although the current corporate governance system in the United States allows investors to ratify, through their proxy votes, the manager's selection of auditor, the investors are not given alternative auditor choices. We provide the manager's recommendation along with alternatives and the proposed fees of all auditors. Investors can ratify management's choice or make their own choice.

[5] Evidence of the client advocacy concern goes back to at least 1955 (Griswold 1955; Stans 1955) regarding auditors providing both tax and auditing services. Management advisory services and advocacy issues can be found in Cony (1961) and Schulte et al. (1967). Both issues are also discussed by Mautz and Sharaf (1961).

[6] The U.S. Supreme Court ruled in 1984 in *United States v. Arthur Young & Co.* (1984) that "the accountant maintains total independence from the client at all times and requires complete fidelity to public trust."

advocacy as an independence issue. Client advocacy begins with the decision makers charged with hiring and firing the audit firm (AICPA 1978, 8).

A fundamental issue is the apparent control of the hiring and firing of auditors by company management (Saul 1996), in that auditors may become advocates of the management that hires and fires them. Critics argue that in this client-supplier relationship, the auditor is obligated to serve its clients' needs, possibly allowing managers to engage in aggressive reporting practices. In the words of investment billionaire Warren Buffet, "Though auditors should regard the investing public as their client, they tend to kowtow instead to the managers who choose them and dole out their pay." He quoted a proverb: "'Whose bread I eat, his song I sing'" (Hilzenrath 2001, A1).

Auditors who do not recognize or respond to this pressure may suffer consequences. Even the popular press can find numerous examples of auditors being fired for disagreeing with clients or issuing modified opinions (Deener 2002). Others have cited the relationship between auditors and their clients as a core independence problem, calling for changes from client management choosing auditors to a system where investors make the decision (Lev 2002). A top Big 5 executive has also called for changes so that independent audit committees, not management, make the hiring and firing decision (Turley 2002).[7]

Further evidence that auditors perceive their clients as company management, and that audit firms emphasize the need to serve management, comes from the report and recommendations of the Panel on Audit Effectiveness (2000). It states:

> Audit personnel constantly receive messages from firm management on such topics as audit efficiency and effectiveness, *client service, client relationships, profitability, marketing of services* and development of personnel. Often these messages only indirectly imply that quality audit work is an integral part of quality client service. *They often do not focus directly on audit quality in the context of a service provided to protect the interests of the investing public.* (emphasis added)

The Panel goes on to include in its recommendations a call to top management at audit firms to reaffirm the importance of their audit practices and the banners of objectivity, independence, professional skepticism, and accountability to the public.

The accounting profession typically responds to charges that the basic auditor-client relationship threatens independence by citing the incentives for auditors to provide high-quality audits. These incentives include the threat of litigation and potential adverse consequences to the audit firm's reputation resulting from an audit failure. Both of these incentives increase audit quality—and by definition auditor independence—in settings where accounting principles and audit standards are straightforward, with little room for interpretation. However, in settings where accounting standards require judgment because they are not clear-cut, the effectiveness of both litigation and reputation are decreased and independence issues can arise (Magee and Tseng 1990; Mayhew et al. 2001).

Experiments on Auditor Independence

Experiments on auditor independence can be categorized into two broad types: (1) research that uses practicing auditors who review and make decisions on contextually rich case scenarios, and (2) research that uses student subjects who make decisions in market settings that provide financial incentives. These two approaches are complementary. The first approach does not control the participants' incentives, whereas the second does; the second does not utilize practicing auditors in their familiar decision contexts, whereas

[7] Turley was the chairman of Ernst & Young at the time he wrote his commentary.

the first does. Interestingly, the findings of both types of studies are similar with respect to auditor independence.

Hackenbrack and Nelson (1996) and Salterio and Koonce (1997) both use practicing auditors to investigate whether increased uncertainty about the appropriate accounting treatment impacts auditor objectivity. Both studies find that when uncertainty about the appropriate accounting treatment increases, auditors are more likely to adopt their client's preferred accounting treatment.

Prior experiments using student subjects provide evidence that when managers have control of the hiring and firing of the auditor and there is some uncertainty concerning the appropriate audit report, auditors violate their objectivity (Mayhew et al. 2001). In contrast, in the absence of uncertainty about the correct audit report or accounting treatment, auditors appear to remain objective to protect their reputations.

Studies from both categories of experimental research suggest that auditor objectivity is threatened in the presence of even modest levels of uncertainty about the correct accounting treatment. The current study extends this research by examining whether a change in control over the auditor's financial incentives from the client to investors impacts the objectivity of the auditor in settings with accounting uncertainty.

Hypothesis

Our main research question is whether investor selection of auditors impacts auditor independence differently than manager selection of auditors. We start with the basic game theoretic predictions from the multiperiod experiment we describe in the next section. As discussed previously prior research suggests that in the presence of uncertainty managers prefer auditors to be biased, and auditors respond accordingly (Mayhew et al. 2001). We argue that from a game theory perspective, investors are indifferent to the choice of an objective or a biased auditor. This indifference creates the main tension in our paper: Does investor selection of auditors influence auditor independence differently than manager selection of auditors?

There are two pure strategy equilibria in the experiment. One is a lemons equilibrium where auditors do not investigate and always agree with the manager's report; managers make the low-cost, low-return investment and always report high-asset value; and investors ignore the manager's and auditor's report in forming bids. The other equilibrium is a reputation or independence equilibrium where auditors investigate and report objectively, managers make the costly high-return investment, and investors rely on the joint auditor and manager report in determining their bids. Of course, the multiperiod and uncertain end period components of the game allow numerous alternative equilibria. However, the two equilibria discussed represent the two end points to the continuum of possible equilibria. Prior research has also documented fairly strong tendencies toward the two pure strategy equilibria (Mayhew 2001; Mayhew et al. 2001). Furthermore, if we assume managers, auditors, and investors want to maximize their total earnings, then we expect the independence equilibrium to form as it provides the maximum economic surplus for the whole market.[8]

We cannot assume that changing the auditor selection to investors will result in the independence equilibrium forming. This is because in equilibrium investors are equally

[8] For a more complete description of the equilibria in the game and the incentives for each player, see Mayhew et al. (2001). In a strict equilibrium sense, managers should capture nearly all the surplus in the market, given that both investors and auditors should drive their share of the surplus down to their opportunity costs via competitive bidding for the audit job and assets, respectively.

well off in either the lemons or the independence equilibrium. Therefore, investors have no obvious preference between objective and biased auditors. To understand this better, we briefly outline the investors' incentives in our game. Investors earn the difference between what they pay for an asset and the asset's actual value. They win the rights to an asset in an auction against other investors. Investors all have the same information, and we assume they use it in the same rational manner. As a result, the winning investor bid should reflect the information and the information quality received by the investors—that is, prices adjust based on the objectivity of the information received. Prices will fully reflect objective information and will ignore or discount biased information. Investors earn zero economic profits in both the lemons and the independence equilibria because they adjust their bids based on the quality of the information and compete among each other to purchase the assets.[9] Hence, the investors have no preference for objective versus biased auditors. This result does not mean that whether the auditor is objective or biased does not impact investors' strategies—it does. Investors ignore biased auditors while they incorporate the information provided by objective auditors into their bids. However, the bids reflect the investors' expectations of the underlying asset value, which in equilibrium is correct, so regardless of whether the auditor is independent, the investors' profits do not change. Because their payoffs do not differ across the two equilibria, investors have no *ex ante* preference that auditors be objective or biased.

The predictions based on game theory are somewhat unsatisfying in that it seems intuitive to argue that investors prefer objective auditors. Part of this dissatisfaction is caused by confusion between investors' preferences and their reactions to objective auditors. Investors should have no preference for objective auditors, but they do react to objective auditors by adjusting their bids. The remaining dissatisfaction results from the failure of game theory to incorporate relevant behavioral theories. There is at least one behavioral theory as to why investors prefer objective auditors. Investors can attempt to avoid or reduce ambiguity by selecting an objective auditor. An objective auditor reduces the overall ambiguity that investors face given that investors have more reliable information on which to base their bids.[10] Ellsburg (1961) and others have shown that people are generally averse to ambiguity and perceive value in a reduction of ambiguity. Assuming that investors bear no additional costs for objective auditor reporting, the additional benefit of objective information will result in an investor preference for objective auditors since objective auditors reduce ambiguity. Our basic research design does not incorporate an additional cost to investors when they select auditors, so we expect ambiguity-averse investors to prefer objective auditors.

We expect auditors to respond to the reporting preferences of the party who has the power to hire and fire them. We argue, based on prior research, that in the presence of

[9] The derivation of equilibria where investors earn zero economic profits also assumes full rationality of the investors and common knowledge. In such equilibria all investors have the same knowledge about the objectivity of the auditor's reports, know that each of them have the same information, and assume that all behave rationally. In equilibrium all the auditor's beliefs are accurate and prices reflect the underlying probabilities of receiving a high or low asset. Hence, in equilibrium investors bid down to their opportunity cost and earn zero economic profits.

[10] Investors face more than just uncertainty about whether the manager's investment produces a high- or low-value asset. Under uncertainty investors do not know which outcome will occur, but they do know the likelihood of an outcome occurring. Under ambiguity investors do not know which outcome will occur or the likelihood of a given outcome occurring. In our game, when the auditor's report is not objective, investors face ambiguity in terms of the asset's value because they do not know how likely it is that the manager will invest in the high-value asset, and they do not have credible information about the value of the asset.

accounting uncertainty, managers prefer auditors who follow the manager's preferred reporting practices. From a game theory perspective, investors have no clear preferences to select objective versus biased auditors. But behavioral theory suggests that ambiguity aversion may lead investors to prefer objective auditors. This theory along with our assumption that auditors will supply the type of reporting demanded by the party with the power to hire and fire the auditor, leads to Hypothesis 1 stated in alternative form:

H1: Investor selection of auditors will increase the proportion of objective auditor reporting decisions.

We next describe the experimental market in which we test this hypothesis and the treatments we use to explore the boundaries of investor selection. We then empirically test H1. After showing support for H1, we investigate the implications of enhanced auditor independence for the behavior of market participants. Although there has been substantial discussion in prior research and the popular press about the importance of independence, little empirical evidence exists that independence matters in a market economy. Our experiments provide direct evidence that increased auditor objectivity can impact the behavior of market participants and the overall surplus in the economy.

III. EXPERIMENTAL DESIGN

The experimental design in this market is similar to that used in Mayhew et al. (2001), which evolved from earlier work by Dopuch et al. (1989). We describe the sequence of actions in the market. A brief explanation of the experimental purpose of each step is included in *italics* to facilitate the reader's understanding of the market design.

The baseline treatment follows the sequence outlined here for each period. Participants were told the experiment would last 20 periods with certainty, with a 20 percent chance that any subsequent period would be the last period.[11]

1. Each of three auditors submits prices to each of three managers. Auditors bid from 0 to 1800 and can bid differently across managers.[12] An auditor who is not hired receives 40. *Multiple audit bids to each manager creates competition among auditors in both price and audit quality. The payment of 40 to auditors who do not win bids creates controlled opportunity costs and the resulting potential for participants to earn accounting profits.*[13]
2. Each of the managers privately invests in one of two costly production processes, which we operationalize with two bins. Bin 0 (1) costs 150 (300) and produces a 600 value 100 percent (40 percent) of the time and a 1,800 value 0 percent (60 percent) of the time. *Two bins, with different risks and returns, create the possibility*

[11] The end period was randomly selected and presequenced using the probabilities described in a manner similar to that used by King (1996). For a discussion of the pros and cons of presequencing, see DeJong et al. (1985).

[12] The currency of trade in the markets is experimental dollars, which are converted to U.S. dollars at the end of the experiment. We report all amounts in the paper in experimental dollars.

[13] Once a participant shows up for an experiment, his or her opportunity costs approach zero during the experiment. By including the 40 for not being hired, we explicitly create and control opportunity costs and accordingly the decision-driven profits of auditors. Accounting profits refer to the difference between the auditor's revenue from fees and the costs of investigation. It differs from economic profit, which would also include a deduction for opportunity costs. If opportunity costs approach zero, then accounting profit may also approach zero as competition drives the prices of audits to the cost of auditing. The research design depends critically on the potential for participants to earn an accounting profit from their decisions.

of differential investment in the economy and accordingly a potentially economically meaningful role for the auditor if the auditor can facilitate investment in bin 1.

3. Each manager hires an auditor. Each manager can hire any auditor, but has to pay the experimenter a switching fee of 100 if the auditor he hires is different from the auditor hired in the previous period. *The switching fee represents the transaction costs of switching auditors and creates the potential for low-balling and quasi-rents for auditors (DeAngelo 1981a).*
4. Each manager learns the investment value (600 or 1,800) and then discloses a value (600 or 1,800) to the four investors. Managers are required to disclose 1,800 values as 1,800 but are allowed to disclose 600 values as either 1,800 or 600. *Managers can misrepresent low values as high, creating a role for auditors as attesters to management-supplied information. We do not allow managers to report high values as low given that this is a weakly dominated strategy and eliminating it simplifies the design.*
5. Hired auditors choose whether to incur an investigation cost of 120 for each asset they investigate. The auditor observes the actual (wrong) value 80 percent (20 percent) of the time for each asset they investigate. *The investigation cost proxies for the marginal effort necessary to identify management misrepresentations. The probability that the information received by an investigating auditor is correct proxies for accounting uncertainty.*[14]
6. Each hired auditor issues a report stating whether she agrees or disagrees with the manager's disclosure. *The auditor can choose whether to objectively report the underlying information. This decision creates our observation of the auditor's objectivity.*
7. The investors simultaneously receive the following information for each manager: the manager's disclosure, the auditor's identification, whether the auditor agrees or disagrees with the manager's disclosure, and the fee paid to the auditor. We do not reveal the manager's identity and randomly shuffle the order in which the manager's information is displayed to investors to make it difficult for managers to form reputations with investors. *This information enables the auditor to form a reputation for objective audit reports with investors. The inability of managers to form reputation enables us to focus on auditor reputation.*
8. Each investor bids for each manager's asset in a first-price sealed-bid auction. Investors bid from 0 to 1,800 and can bid differently across manager assets. Winning bidders earn the difference between their bid and the actual asset's value. Investors who do not win any assets in a period earn 10. *The first-price auction is used for simplicity. It approximates a demand-revealing auction due to the number of bidders (4) and the common value of the asset. The payment of 10 to investors who do not win bids creates controlled opportunity costs and the resulting potential for participants to earn accounting profits. The investors' bids provide information about the credibility supplied by the auditor.*

[14] In our research design accounting uncertainty is based on the imprecise evidence received by the auditor. Some have argued that this notion is closer to auditor uncertainty or evidence reliability. Analytically the concepts have an equivalent effect. It does not matter whether the source of the uncertainty is the result of some imprecision of GAAP, GAAS, or imprecise audit evidence. All that is necessary is that the construct creates a degree of uncertainty in the proper accounting treatment. See Magee and Tseng (1990) for the analytical structure of the uncertainty and Calegari et al. (1998) and Mayhew et al. (2001) for experimental implementation of the construct.

9. All auditors, managers, and investors observe the following information for each asset: the winning investor's bid, the manager's disclosed value, the auditor's report and identification number, and the actual value. In addition, each period we provide a summary of how many times each auditor has been hired and how many times each auditor has issued an incorrect report. *All players receive the same set of information. Summary information about auditor performance simplifies record keeping for investors and managers.*[15]

The multiperiod setting combined with an uncertain end period allows for numerous equilibria. The two most compelling equilibria based on prior research are (1) a lemons equilibrium where managers make low investments (bin 0), auditors do not investigate manager disclosures, and investors bid at or near the low asset's value; and (2) a reputation equilibrium where managers make the high investment (bin 1); auditors investigate and objectively report their information about the manager's asset; and investor bids reflect the value implied by the manager disclosure, auditor report, and the known uncertainty of the auditors. (See Mayhew et al. [2001] for a more complete specification.)[16] The properties of these markets have been studied extensively. The use of a well-established research design strengthens our confidence in the inferences we draw in our analysis.

The *Baseline* treatment establishes the base case where prior research demonstrates auditors will not objectively report the asset's value. The *Baseline* treatment is similar to the *uncertainty treatments* used in Mayhew et al. (2001) where auditors violated their objectivity in nearly every instance. In Mayhew et al. (2001) auditors were required to investigate. The investigation choice in the current study effectively creates a moral hazard over effort for auditors as well as a reporting decision. This is a particularly interesting setting in which to investigate independence because an auditor who plans to violate his/her independence prefers to shirk on effort as well. Our initial motivation was to see if investor selection would resolve both the auditor's objectivity violations (Mayhew et al. 2001) and moral hazard (Mayhew 2001; Dopuch et al. 1989). We also provide a treatment without a moral hazard over effort to provide a linkage to prior research.

We report three different treatments that modify the *Baseline* design, an investor selection treatment (*Investor Selection*), investor selection plus bonus treatment (*Investor Selection Bonus*), and a no auditor moral hazard investor selection treatment (*Investor Selection NMH*). We outline the differences in each:

Investor Selection. Same as *Baseline* except after step 3 a manager's choice of auditor is revealed to one of the investors, along with that auditor's proposed fee, and the proposed fees of the remaining auditors not selected by the manager. The investor then decides whether to accept the manager's choice or to select a different auditor for the manager. A different investor is assigned to each manager within a period. Across periods the manager-investor pairing is rotated each period. The investor receives the same audit fee information as the manager.

[15] All information is provided at the end of each period. We believe that such information is also available in field settings. However, in field settings information on audit failures is often received with some time lag. The quicker feedback on audit quality in our setting should make it harder for participants to take advantage of accounting uncertainty, or stated differently, should enable auditors to profitably remain objective. The increased time lag in field settings would likely lead to a greater lack of objectivity due to the delay in feedback about audit quality.

[16] This could also be considered an independence equilibrium. We use the terms lemons equilibrium and reputation equilibrium, because these are consistent with prior research.

Investor Selection Bonus. Same as *Investor Selection* except that the investor assigned to a manager receives a bonus equal to 10 percent of the manager's profits each period.

Investor Selection NMH. Same as *Investor Selection* except that the auditor must investigate the seller's asset in step 5. This removes the auditor's moral hazard over audit effort.

Our main question is how investor selection impacts auditor objectivity compared to manager selection. Our treatments are also designed to probe the boundaries of investor selection. The *Investor Selection* treatment captures how investor selection of auditors impacts auditor behavior compared to the baseline. The investors making the selection decision have no direct financial interest in the manager's firm for which they select an auditor. The investors' only concern is the information about the asset they will be bidding upon. The investors in this setting represent potential future investors in the company.

Investor Selection Bonus is designed to capture the more realistic case where investors making the auditor selection decision have a financial interest in the manager's asset. This setting is designed to capture the basic incentives faced by independent audit committee members or current investors in the company. The incentives in this treatment are particularly interesting. Essentially, the investor becomes part owner of the asset being sold but does not control the investment decision to create the asset. It is in the best interest of the investor to select objective auditors and thereby maximize the manager's incentive to make the costly investment. However, *ex ante* we cannot eliminate the possibility that investors will act like managers in the *Baseline*, essentially seeking auditors that allow more aggressive reporting even if the auditor is less credible with investors.

Finally, we include a treatment with no moral hazard to connect to prior research that excluded moral hazard over auditor effort (Mayhew et al. 2001). The *Investor Selection NMH* treatment is the most direct test of independence in that it focuses on the auditor's reporting decision holding audit effort (and equivalently audit quality) constant. We also believe that the institutional tools available to resolve auditor's moral hazard are more effective than the tools available to monitor reporting decisions when GAAP contains some uncertainty. These tools include peer review, professional standards for auditing, and litigation.

IV. RESULTS

We use two metrics to test H1. We define an independence violation identically under each measure, but the measures differ in terms of what we consider an opportunity to violate independence. Table 1 provides an overview of our metrics' definitions. An independence violation occurs when a manager reports a high value (1,800) and (1) the auditor does not test the asset and agrees with the manager's disclosure, or (2) the auditor tests the asset and agrees with the manager's "high" disclosure despite observing a "low" signal. Note that our definition of an objectivity violation is independent of audit report accuracy. An auditor may provide an incorrect report that is objective, because the auditor objectively reports the information he or she receives that turns out to be incorrect. Similarly the auditor may issue a nonobjective report that is correct. Our variable *IND_1* is the proportion of all assets sold in which auditors violate their independence. This measure is generous to the auditor because it considers all opportunities, not just the ones where auditors could violate their independence. The advantage of this measure is that it captures any market-wide impact of the institutional change on independence. For example, if managers report more truthfully in response to the auditor's objective reporting, the *IND_1* measure will measure a lower percentage of independence violations.

TABLE 1
Objectivity and At-Risk Matrix

		Auditor Tests				Auditor Does Not Test	
		Result Shows High		Result Shows Low		NA	NA
		Auditor Reports Agree	Auditor Reports Disagree	Auditor Reports Agree	Auditor Reports Disagree	Auditor Reports Agree	Auditor Reports Disagree
Manager Reports	High Asset	Not At Risk	Not At Risk	At Risk & Violation	At Risk & No Violation	At Risk & Violation	At Risk & No Violation
	Low Asset	Not At Risk				Not At Risk	

This table shows the objectivity violations and at-risk decisions used to calculate our measures of auditor independence. We measure independence violations with two different measures:

IND_1 = objectivity violations/total observations;

IND_2 = objectivity violations/at-risk decisions; and

At-Risk Decision = manager reported high and either the auditor did not test, or the test showed low.

Not at-risk decisions do not produce objectivity violations.

Second, we use a more restrictive definition of independence opportunities that focuses on "at-risk" decisions. We define at-risk situations as the opportunities where the auditor could violate independence. Situations where the auditor has no reason to violate independence are excluded. At risk decisions include cases where the manager has disclosed the high value, and (1) the auditor investigates and the results show low or (2) the auditor does not investigate. The at-risk definition recognizes that if a manager discloses low, then there is no reason to investigate or to disagree, so we do not consider this an at-risk situation. Also, when an auditor's information agrees with a manager's high disclosure, the auditor's reporting decision is not at-risk. The *IND_2* measure is the proportion of independence violations to all at-risk decisions. *IND_2* is more conservative than *IND_1*. It gives credit to the auditor only when it is possible for the auditor to violate objectivity. Of course, it does not give credit for the overall impact of more auditor objectivity on manager reporting decisions. Overall, both measures are necessary for us to understand the impact of our institutional changes on auditor independence to test H1.

Table 2 shows the mean number of objectivity violations per market and both independence measures for the four treatments. In Figures 1 and 2, we rank each cell from lowest to highest proportion of independence violations and show that although there is some overlap, the treatments appear essentially monotonic in reducing violations. A simple ANOVA (results not tabled) on the 12 markets confirms an overall impact of investor selection on independence using either *IND_1* or *IND_2*. Investor selection has a significant main effect, reducing mean violations from 69 percent (82 percent) in the *Baseline* to 25 percent (36 percent) using *IND_1* (*IND_2*) for the *Investor Selection* treatments. This difference is significant at $p < .01$ ($p < .02$).

To test the differences between treatments, we regress dummy variables denoting the treatments on *IND_1* and *IND_2* with each market in a treatment as an observation (equivalent to a simple main effects ANOVA). Panel B of Table 2 shows that the model explains 70 percent (68 percent) of the observed variance using *IND_1* (*IND_2*). The *Investor Selection* treatment reduces violations by 30 (27) percentage points, on average, significant at $p < .07$ ($p < .15$) two-tailed. The *Investor Selection Bonus* reduces violations by an additional 8 (18) percentage points, which, though also significantly less than the *Baseline* (both $p < .03$), does not significantly differ from the *Investor Selection* treatment ($p < .59$ [$p < .32$]). Finally, *Investor Selection NMH* reduces violations another 22 (22) percentage points. *Investor Selection NMH* is significantly less than *Investor Selection* ($p < .07$ [$p < .05$]), but not from *Investor Selection Bonus* ($p < .15$ [$p < .23$]). Independence violations are lower in all of the investor selection treatments in comparison to the *Baseline* treatment in support of H1. Across the *Investor Selection* treatments, the *Investor Selection NMH* treatment has the lowest level of independence violations, which implies that incentives to report objectively and to exert effort provide the highest level of independence in our markets.

V. IMPLICATIONS OF AUDITOR INDEPENDENCE

This section examines the implications of enhanced auditor independence in the markets. We examine the impact of investor selection on auditors', managers', and investors' decisions. This provides us with a deeper understanding of why investor selection improves auditor independence and how improved independence impacts the overall market.

TABLE 2
Auditor Objectivity

Panel A: Auditor Objectivity[a]

Treatment	Number of Observations	Mean Objectivity Violations per Market	Mean At-Risk Decisions per Market	*IND_1*	*IND_2*
Baseline	3*69 = 207	47	58	68.60%	81.72%
Investor Selection	3*69 = 207	26	48	38.16%	55.14%
Investor Selection Bonus	3*69 = 207	21	53	29.95%	37.27%
Investor Selection NMH	3*69 = 207	5	28	7.25%	15.57%

Panel B: Analysis of Variance[b]

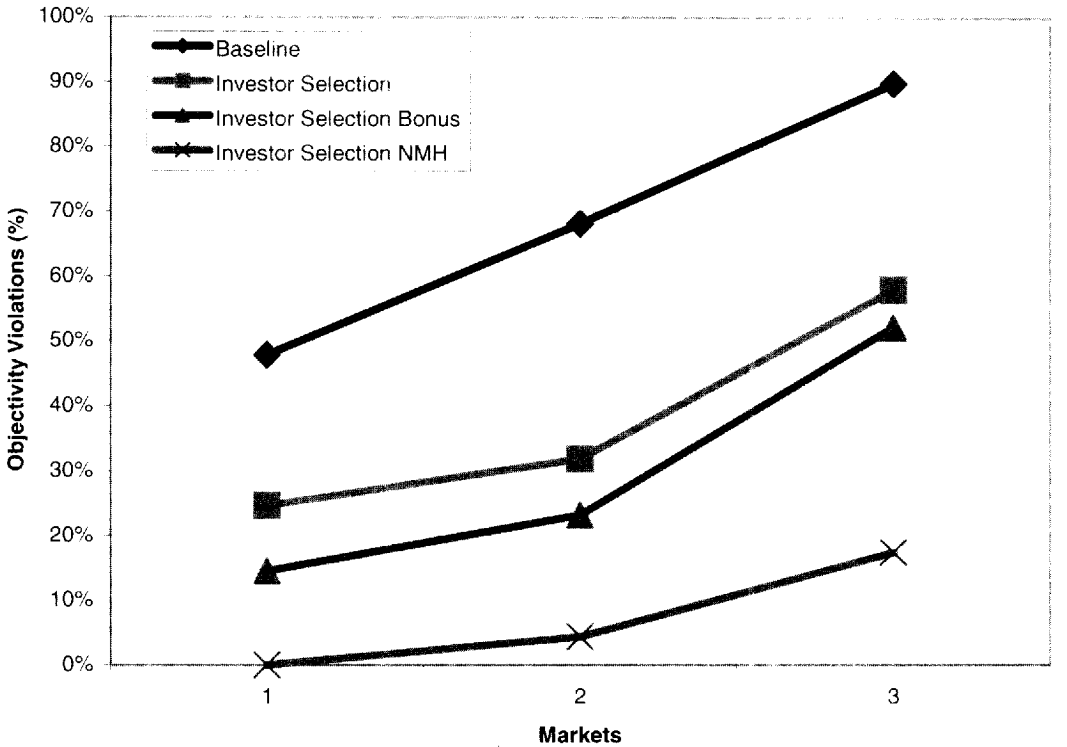
Treatment	*IND_1*	t-stat	p-value	*IND_2*	t-stat	p-value
Baseline (β_0)	68.60	6.80	0.000	81.72	6.99	0.000
Investor Selection (β_1)	−30.43	−2.13	0.065	−26.58	−1.61	0.147
Investor Selection Bonus (β_2)	−38.65	−2.71	0.027	−44.45	−2.69	0.028
Investor Selection NMH (β_3)	−61.35	−4.30	0.003	−66.15	−4.00	0.004
Number of Observations and Overall Significance	n = 12	F = 6.33	0.0166	n = 12	F = 5.73	0.0216
Percentage of Variance Explained R^2 =	70.35%			68.25%		

[a] There are three markets in each treatment, with each market consisting of 23 periods with 3 auditors for a total of 69 observations per market.

[b] Each market is considered one independent observation with three markets per treatment. The coefficients reported for each treatment under *IND_1* (*IND_2*) are the *difference* between mean objectivity violations in each treatment cell and the mean objectivity violations in the *Baseline* condition. Mean objectivity violations in the *Baseline* are reported as the coefficient for the *Baseline* condition. Reported t-statistics and associated two-tailed p-values are for these differences from the *Baseline* condition. Reported t-statistics and associated p-values for the *Baseline* condition tests whether the *Baseline* is different than zero.

IND_1 = objectivity violations/total observations;
IND_2 = objectivity violations/at risk decisions;
At-Risk Decision = manager reported high and either the auditor did not test, or the test showed low;
Objectivity Violations = manager reported high and either the auditor did not test, or the test showed low, and the auditor agreed with the managers report;
Baseline = manager chooses auditor with no oversight, fees are disclosed to investors, and auditor chooses whether to test or not;
Investor Selection = *Baseline*, except an investor either approves each manager's choice of auditor or rejects the manager's choice and selects the auditor;
Investor Selection Bonus = same as *Investor Selection* except the investor who reviews and selects the auditor gets a bonus equal to 10 percent of the profits of the manager she reviews; and
Investor Selection No Moral Hazard = same as *Investor Selection* except auditors are required to investigate the manager's disclosure, removing the moral hazard over effort choices.

FIGURE 1
Type 1 Objectivity Violations (*IND_1*)



This figure graphs the proportion of *IND_1* objectivity violations by market and treatment. Each treatment consists of three independent markets. Each treatment was sorted from lowest to highest portion of *IND_1* objectivity violations.

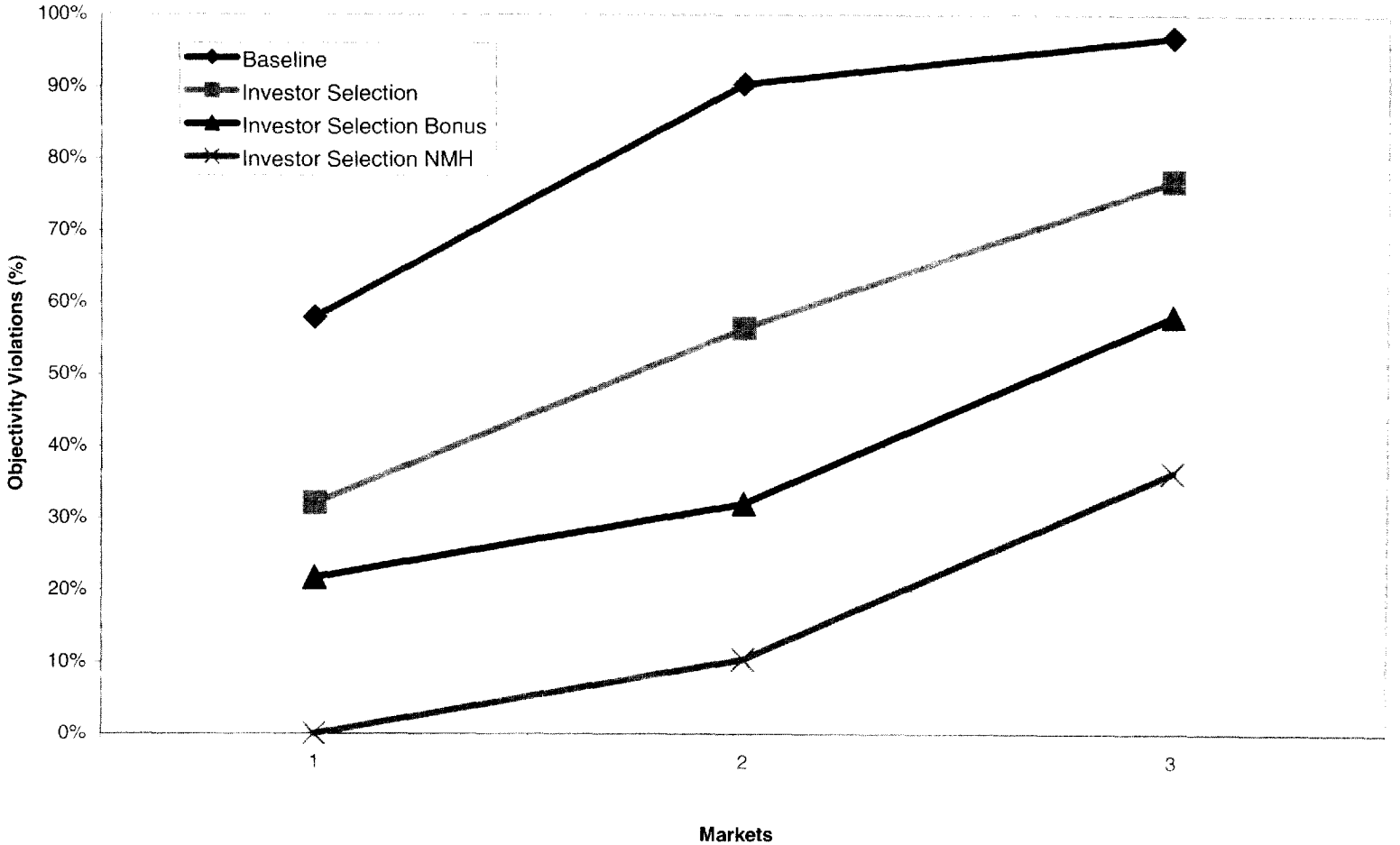
IND_1 = objectivity violations/total observations; and

Objectivity Violations = manager reported high and either the auditor did not test or the test showed low, and the auditor agreed with the manager's report.

Implications for Auditor Behavior

Previously, we showed that investor selection enhances auditor independence. Here we consider how investor selection and our treatments impact audit pricing. We expect low-balling in the *Baseline* markets due to the switching costs faced by managers and evidence from prior research (Mayhew et al. 2001). However, in the *Investor Selection* treatment low-balling could dissipate, given that the investors selecting the auditor do not share the cost of switching auditors. Auditors have little reason to offer services at a discount given that investors, not managers, make the auditor selection. The same logic applies to the *Investor Selection NMH* treatment. *Investor Selection Bonus* links the manager's profitability to the investor making the auditor selection, so low-balling again becomes an expected auditor strategy. In summary, we expect that if the selector of the auditor bears some or all of the switching costs, then the auditor will engage in low-balling. We label this Auditor Implication 1 and test it below.

FIGURE 2
Type 2 Objectivity Violations (*IND_2*)



This figure graphs the proportion of *IND_2* objectivity violations by market and treatment. Each treatment consists of three independent markets. Each treatment was sorted from lowest to highest portion of *IND_2* objectivity violations.

IND_2 = *objectivity violations/at-risk decisions;*
At-Risk Decision = manager reported high and either the auditor did not test or the test showed low; and
Objectivity Violations = manager reported high and either the auditor did not test or the test showed low, and the auditor agreed with the manager's report.

Auditor Implication 1: Auditors (do not) engage in low-balling in the *Baseline* and *Investor Selection Bonus* (*Investor Selection* and *Investor Selection NMH*) treatments.

We also consider whether audit prices differ across treatments after controlling for low-balling. Competition between the auditors suggests there is no reason to expect differences in audit prices across treatments after controlling for low-balling. However, as independence increases the auditor supplies more value to the market and may be able to capture some of that value through fees. Similar to the case of low-balling, the investors who select auditors in the *Investor Selection* and *Investor Selection NMH* treatments do not bear the cost of the auditor and may also be less sensitive to audit pricing. Our second Auditor Implication considers whether pricing differs across treatments.

Auditor Implication 2: Auditors price differently across treatments.

We also consider whether auditors exert more effort in the *Investor Selection* treatments than the *Baseline*. The auditor's choice to investigate the manager's report is our measure of effort. We expect that investor selection should increase auditor investigations that enable the auditor to provide more accurate reports to investors.

Auditor Implication 3: Auditors investigate more often in the *Investor Selection* treatments than the *Baseline* treatment.

We examine Auditor Implication 1 by classifying each auditor hiring as an incumbent or a new auditor hiring. An auditor is an incumbent if he audited the same manager in the most recent period. We examine low-balling within each treatment. After controlling for differences in fees across treatments, we find new auditors earn an average of 13 less than incumbents in the *Baseline* market ($p = .02$) and 59 less in the *Investor Selection Bonus* treatment ($p = .02$) (see Table 3). As expected, in the absence of a direct link between the selector of the auditor and the audit fee there was no low-balling in either the *Investor Selection* or *Investor Selection NMH* treatments. Overall, we find support for Auditor Implication 1.[17]

To compare pricing across treatments we limit our analysis to incumbent auditors. We find that auditors in the *Investor Selection* treatments price significantly higher than the *Baseline* treatment (results not tabled). Individual treatment comparisons show statistically higher fees in each of the *Investor Selection* conditions than in the *Baseline*. It appears auditors are able to earn higher fees for independent behavior. However, at least part of the higher fees is due to the investigation costs born by the auditors. They investigate more often in the investor selection treatments than in the baseline and accordingly charge higher fees to recover the costs.

The fees to incumbent auditors are significantly less in the *Investor Selection* than in the *Investor Selection Bonus* treatment, while the fees in the *Investor Selection NMH* treatment are significantly less than in either the *Investor Selection* or the *Investor Selection*

[17] Theory is split on whether low-balling should impact independence. Dye (1991) and Magee and Tseng (1990) suggest that low-balling can compromise independence, whereas DeAngelo (1981a) and Lee and Gu (1998) suggest that low-balling does not necessarily compromise independence and may even enhance it. Note that additional analysis does not suggest a relation between low-balling and the rate of independence violations. There is no statistical difference in the level of independence between the *Investor Selection* treatment that did not have low-balling and the *Investor Selection Bonus* treatment that did have low-balling.

TABLE 3
Auditor Low-Balling Regression Results

Baseline

Variable	Coefficient	t-stat	p-value
Market 1	40.79	10.35	0.00
Market 2	39.56	10.38	0.00
Market 3	96.63	23.54	0.00
New Auditor	(12.97)	(2.40)	0.02
Number of Observations and Overall Significance	n = 207	F = 48.88	0.0000

Percentage of Variance Explained = R^2 = 41.94%

Investor Selection

Variable	Coefficient	t-stat	p-value
Market 1	680.58	17.66	0.00
Market 2	84.35	2.47	0.01
Market 3	164.60	4.56	0.00
New Auditor	27.56	0.77	0.45
Number of Observations and Overall Significance	n = 207	F = 76.39	0.0000

Percentage of Variance Explained = R^2 = 53.03%

Investor Selection Bonus

Variable	Coefficient	t-stat	p-value
Market 1	498.08	18.02	0.00
Market 2	305.46	12.08	0.00
Market 3	261.29	11.01	0.00
New Auditor	(58.85)	(2.29)	0.02
Number of Observations and Overall Significance	n = 207	F = 21.45	0.0000

Percentage of Variance Explained = R^2 = 24.07%

Investor Selection NMH

Variable	Coefficient	t-stat	p-value
Market 1	149.17	9.41	0.00
Market 2	127.75	9.30	0.00
Market 3	205.74	13.18	0.00
New Auditor	(1.10)	(0.07)	0.95
Number of Observations and Overall Significance	n = 207	F = 6.27	0.0004

Percentage of Variance Explained = R^2 = 8.48%

Each bidding decision is considered one independent observation. The coefficients reported for each treatment under *Market 1*, *Market 2*, and *Market 3* are the mean winning bids in each treatment cell for incumbent auditors. The coefficient reported for *New Auditor* for each treatment is the difference in mean winning bids between new and incumbent auditors within that treatment cell. Reported t-statistics and associated p-values test whether the coefficient is different than zero. A significantly negative coefficient for *New Auditor* implies that low-balling exists in that treatment cell.

Baseline = manager chooses auditor with no oversight, fees are disclosed to investors, and auditor chooses whether to test or not;
Investor Selection = *Baseline*, except an investor either approves each manager's choice of auditor or rejects the manager's choice and selects the auditor;
Investor Selection Bonus = same as *Investor Selection* except the investor who reviews and selects the auditor gets a bonus equal to 10 percent of the profits of the manager they review; and
Investor Selection NMH = same as *Investor Selection* except auditors are required to investigate the manager's disclosure, removing the moral hazard over effort choices.

Bonus treatment. We find this particularly interesting because auditors are most independent in the *Investor Selection NMH* treatment, yet they earn lower fees than in the other *Investor Selection* treatments. Post-experiment discussions with participants provided us a potential explanation. Participants claimed they did not need the auditors in the *Investor Selection NMH* treatment. The participants invested at high rates and information was very reliable. Participants did not seem to think they needed the auditors, even though our other treatments suggest that independence was the key to these outcomes. Essentially, when auditing works well, market participants do not seem to think it is valuable. Further research is necessary to fully investigate this conjecture.

Table 4 suggests that in the *Investor Selection* and *Investor Selection Bonus* treatments, auditors investigate more than in the *Baseline* treatment. Auditors investigate only 11 percent of the time in the *Baseline*. This increases to near 50 percent in the *Investor Selection Bonus* treatment. While the increase is dramatic, it appears that additional incentives may be necessary to induce auditors to investigate every period.

TABLE 4
Auditor Investigations

Panel A: Mean Auditor Effort (Investigations) when Manager Reports High

Treatment[a]	Number of Auditor Investigations	Number of High Reports	Mean
Baseline	21	183	11.48%
Investor Selection	76	188	40.43%
Investor Selection Bonus	91	196	46.43%
Investor Selection NMH	NA	NA	NA

Panel B: Analysis of Variance[b]

Treatment	Auditor Testing Rates	t-stat	p-value
Baseline (β_0)	11.48%	1.65	0.137
Investor Selection (β_1)	28.95%	2.09	0.070
Investor Selection Bonus (β_2)	34.95%	2.24	0.056
Number of Observations and Overall Significance	n = 9	F = 3.88	0.0679
Percentage of Variance Explained R^2 =	10.38%		

[a] There are three markets in each treatment, with each market consisting of 23 periods with 3 auditors, 3 managers, and 4 investors.

[b] The coefficient on *Investor Selection* is not significantly different from the coefficient on *Investor Selection Bonus* ($t = 0.51$, $p < 0.624$). *Investor Selection* appears to increase auditor effort but the bonus has no effect. Each market is considered one independent observation. The coefficients reported for each treatment under Auditor Testing Rates are the *difference* between mean auditor testing rates in each treatment cell and the mean testing rates in the *Baseline* condition. Mean testing rates in the *Baseline* are reported as the coefficient for the *Baseline* condition. Reported t-statistics and associated two-tail p-values are for these differences from the *Baseline* condition. Reported t-statistics and associated p-values for the *Baseline* condition tests whether the *Baseline* is different than zero.

Baseline = manager chooses auditor with no oversight, fees are disclosed to investors, and auditor chooses whether to test or not;
Investor Selection = *Baseline*, except an investor either approves each manager's choice of auditor or rejects the manager's choice and selects the auditor;
Investor Selection Bonus = same as *Investor Selection* except the investor who reviews and selects the auditor gets a bonus equal to 10 percent of the profits of the manager they review; and
Investor Selection NMH = same as *Investor Selection* except auditors are required to investigate the manager's disclosure, removing the moral hazard over effort choices.

Implications for Investor Behavior

We consider two aspects of investor behavior. (1) we look at how increased auditor independence impacts investor bids and, (2) we examine which auditors the investors select in the *Investor Selection* treatments. As part of the second point, we look at the impact of more independent auditors on mean investor profits.

As auditor independence increases, the prices investors are willing to pay for assets with High, Agree reports should also increase. This simply reflects the increased confidence in the auditors' reports.

Investor Implication 1: Investors' bids (prices) increase for High, Agree reports as the level of auditor independence increases.

We expect investors to select auditors that behave more independently within a market. This will create incentives for the auditors to make independent decisions. We also expect investors to benefit by selecting more independent auditors by reducing the ambiguity they face when bidding on assets.

Investor Implication 2: Investors select more independent auditors more frequently than less independent auditors in the *Investor Selection* treatments.

We also examine investor profitability across treatments. Game theory predicts that investors will earn zero economic profits regardless of the treatment. Evidence that investors do not earn differential profits across treatments would add credibility to our assertion that any observed preference for objective auditors is caused by ambiguity aversion rather than higher returns.

Investor Implication 3: Average investor profits do not differ across treatments.

Panel A of Table 5 shows mean winning bids for reported High, Agree assets by treatment. Panel B shows a simple main effects ANOVA of winning bids for High, Agree assets by treatment. Panel B suggests that prices increase across treatments in a manner similar to the decrease in objectivity violations shown in panel B of Table 2. To investigate this further, we run a simple regression of *IND_1* (*IND_2*) on mean winning bids on High, Agree reports by market (results not tabled). The coefficient on *IND_1* (*IND_2*) is significantly negative ($p < .01$) for both measures of independence. As the level of independence violations increases, the prices investors are willing to pay for High, Agree assets decreases. This supports Investor Implication 1.

As a simple test of Implication 2, we run a regression (not tabled) of the rank of each auditor based on the number of periods they were hired on individual auditor measures of *IND_1* (*IND_2*). We find that the higher the rank of independence violations (i.e., the less independent the auditor) the lower their rank in terms of periods hired ($p < .02$ [.03] with 3 auditors $\times$ 12 markets = 36 observations).

We calculate average investor profits by session and then run an ANOVA on mean investor profits by treatment. A simple main effects ANOVA suggests that none of the treatments generates a significantly higher (or lower) profit than the others (not tabled). This suggests, consistent with the predictions of game theory and Investor Implication 3, that investors do not earn differential profits by treatment.

TABLE 5
Investor Bids

Panel A: Mean Investor Bids under High/Agree Condition[a]

Treatment	Number of High/Agree Observations	Mean Investor Winning Bid for High/Agree Reports
Baseline	152	1,020
Investor Selection	123	1,542
Investor Selection Bonus	98	1,321
Investor Selection NMH	116	1,611

Panel B: Analysis of Variance

Treatment	Investor Winning Bid	t-stat	p-value
Baseline (β_0)	1,020	6.39	0.000
Investor Selection (β_1)	522	3.12	0.010
Investor Selection Bonus (β_2)	301	1.82	0.096
Investor Selection NMH (β_3)	591	3.61	0.004
Number of Observations and Overall Significance	n = 12	F = 11.70	0.0010
Percentage of Variance Explained R^2 =	58.70%		

[a] There are three markets in each treatment, with each market consisting of 23 periods with 3 managers selling assets each period for a total of 207 maximum observations for each treatment.

Each market is considered one independent observation. The coefficients reported for each treatment under Investor Winning Bid are the *difference* between mean winning bids in each treatment cell and the mean winning bids in the *Baseline* condition. Mean winning bids in the *Baseline* are reported as the coefficient for the *Baseline* condition. Reported t-statistics and associated two-tail p-values are for these differences from the *Baseline* condition. Reported t-statistics and associated p-values for the *Baseline* condition tests whether the *Baseline* is different than zero.

Baseline = manager chooses auditor with no oversight, fees are disclosed to investors, and auditor chooses whether to test or not;
Investor Selection = *Baseline*, except an investor either approves each manager's choice of auditor or rejects the manager's choice and selects the auditor;
Investor Selection Bonus = same as *Investor Selection* except the investor who reviews and selects the auditor gets a bonus equal to 10 percent of the profits of the manager they review; and
Investor Selection NMH = same as *Investor Selection* except auditors are required to investigate the manager's disclosure, removing the moral hazard over effort choices.

Implications for Manager Behavior

The manager's choice of investment is the key determinant of economy-wide surplus in a manner parallel to the role of investment in any economy. Greater investment in bin 1 increases the overall surplus in the economy as each bin 1 investment increases the probability of creating an 1,800 asset from 0 to 60 percent. Increased auditor independence will increase the payments received from investors for high value assets (see Investor Implication 1), and as a result managers will invest in bin 1 more frequently. We consider whether our investor selection treatments, already demonstrated to be associated with increased auditor independence, also are associated with increased rates of investment in bin 1.

Manager Implication 1: Investor selection (Auditor Independence) increases investment in bin 1 by managers and economy-wide profit.

We examine Manager Implication 1 by comparing the level of bin 1 selections by managers across treatments. Panel A of Table 6 shows the mean bin 1 percentages for each treatment. The ranked results by market and treatment are displayed in Figure 3. Again, we use simple, main effects ANOVA. We regress dummy variables representing the treatments on the proportion of bin 1 investments, where each market represents an observation (Panel B of Table 5). We find a significant main effect of *Investor Selection* ($p < .04$), explaining 56 percent of the observed variance. Managers invest significantly more often in both the *Investor Selection* ($p < .04$) and *Investor Selection NMH* ($p < .03$) treatments than in the *Baseline*. The *Investor Selection Bonus* is not significantly different ($p < .31$) than the *Baseline*, and the *Investor Selection* and *Investor Selection NMH* are not significantly different ($p < .84$) from each other. Overall, *Investor Selection* increases the proportion of bin 1 choices. To show that this increase in bin 1 choices increases overall market wide profit, we also compare the average total profit by treatment between the *Baseline* and *Investor Selection* treatments. Our analysis suggests that total market-wide profit was higher in the *Investor Selection* treatments than in the *Baseline* treatment ($p = .048$).

VI. DISCUSSION

The results reported in this paper show a striking impact of investor selection on auditor independence. We detect strong increases in objective auditor reporting. The results suggest that institutional rules that provide meaningful power to investors or other nonmanagers over the hiring and firing of auditors could greatly enhance auditor independence. Further, independence increases the overall efficiency of the market as measured by the total market surplus and profit generated.

The limitations of this study are similar to those of any experiment. We greatly simplify the market setting to focus on what we believe are key market forces. The experiment abstracts away from mundane realism (Swieringa and Weick 1982). However, it is possible that in a richer market setting, unanticipated interactions could impact outcomes. One aspect deserves specific mention. Our results are limited to cases where the auditor can reasonably be expected to uncover fraud using Generally Accepted Auditing Standards.[18] Although we acknowledge this limitation, we caution against the reader too easily dismissing our results on this account. The setting we use has been employed in many prior experiments under a variety of treatments and is generally well understood. Our investor selection modification

[18] We assume the auditor's investigation percentage is equivalent to choosing to implement basic GAAS.

TABLE 6
Manager Investment

Treatment	Average Number of Periods Bin 1 Selected Per Market	Average Number of Periods Bin 0 Selected Per Market	Percentage of Periods Bin 1 Selected	Percentage of Periods Bin 0 Selected
Mean *Baseline*	32	37	46.38	53.62
Mean *Investor Selection*	59	10	85.51	14.49
Mean *Investor Selection Bonus*	44	25	63.29	36.71
Mean *Investor Selection NMH*	61	8	88.89	11.11

Panel B: Analysis of Variance

Treatment	Percentage Costly Investment (Bin 1)	t-stat	p-value
Baseline (β_0)	46.38%	4.26	0.003
Investor Selection (β_1)	39.13%	2.54	0.035
Investor Selection Bonus (β_2)	16.91%	1.10	0.305
Investor Selection NMH (β_3)	42.51%	2.76	0.025
Number of Observations and Overall Significance	N = 12	F = 3.36	0.0759
Percentage of Variance Explained R^2 =	55.73%		

Each market is considered one independent observation. The coefficients reported for each treatment under Percentage Costly Investment (Bin 1) are the *difference* between the mean percentage of times managers invested in Bin 1 in each treatment cell and the mean percentage of costly investments in the *Baseline* condition. The mean percentages of the time managers invested in the *Baseline* are reported as the coefficient for the *Baseline* condition. Reported t-statistics and associated two-tail p-values are for these differences from the *Baseline* condition. Reported t-statistics and associated p-values for the *Baseline* condition tests whether the *Baseline* is different than zero.

Manager Investment = each period, three managers had to choose Bin 1, at a cost of E$300, which gave them a 60 percent chance of receiving a HIGH asset (worth E$1,800) and a 40 percent chance of receiving a LOW asset (worth E$600), or they chose bin 0 to receive a LOW asset for sure at a cost of E$150;

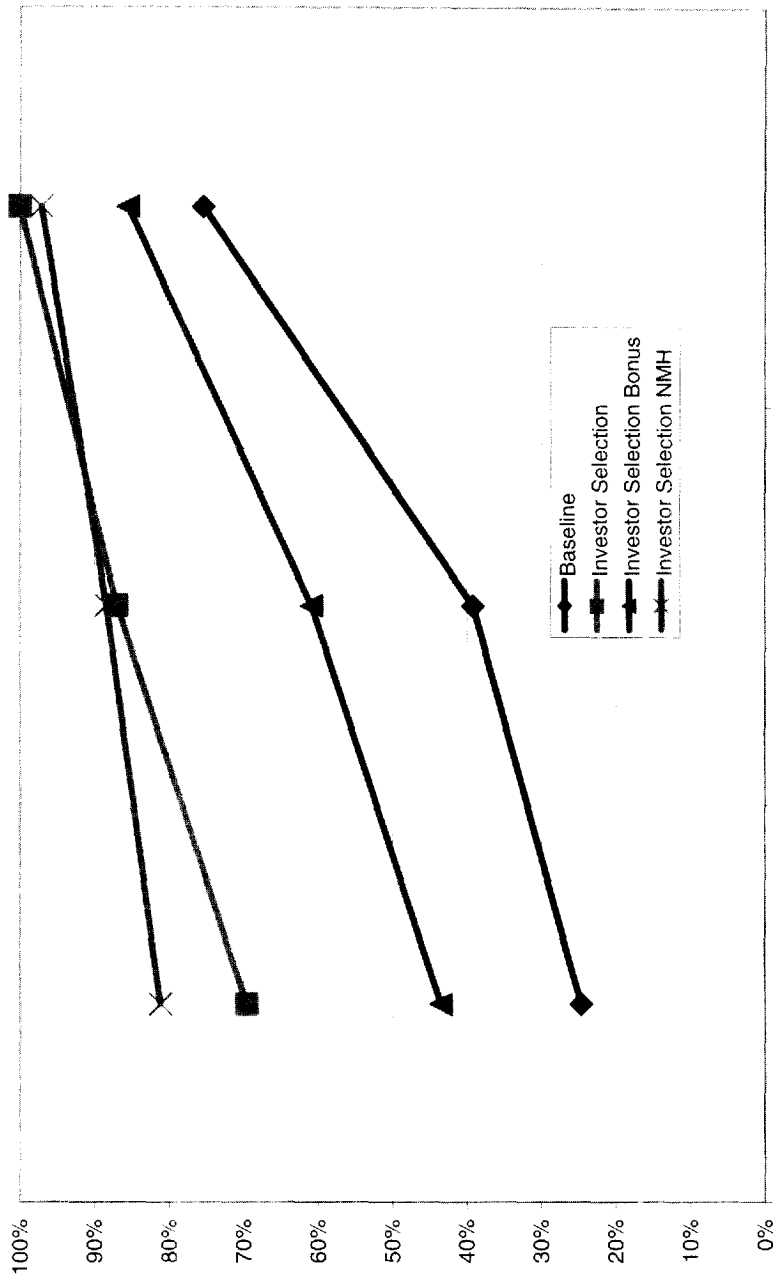
Baseline = manager chooses auditor with no oversight, fees are disclosed to investors, and auditor chooses whether to test or not. Each market had 69 possible investment opportunities;

Investor Selection = *Baseline*, except an investor either approves each manager's choice of auditor or rejects the manager's choice and selects the auditor;

Investor Selection Bonus = Same as *Investor Selection* except the investor who reviews and selects the auditor gets a bonus equal to 10 percent of the profits of the manager they review; and

Investor Selection NMH = Same as *Investor Selection* except auditors are required to investigate the manager's disclosure, removing the moral hazard over effort choices.

FIGURE 3
Investment Choices



This figure shows the percentage manager investments in Bin 1 by market and treatment. The markets within each treatment have been sorted from lowest to highest proportion of Bin 1 investments.

to the institution has a very strong effect on auditor behavior in light of this prior research. Future research may want to consider how this institutional change impacts auditor efforts and ability to uncover collusive fraud.

The Sarbanes-Oxley Act has increased the separation between managers and auditors by requiring that the audit committee make all auditor-related hiring and retention decisions. However, this is not the same thing as having investors choose the auditor. At best, the board of directors' audit committee not only represents investors, but may also have incentives to please management, especially given the large number of corporations in which the CEO is also the chairman of the board. Further research into the institutional structures that promote audit committee independence or produce the types of incentives for auditor independence documented in our investor selection treatments is clearly warranted. Some people may argue that public companies seek investor ratification of their auditor selection through annual proxy ballots. In most of the cases we have observed, however, the choice provided is to ratify the auditor that the audit committee has nominated. It is difficult to argue that investors can effectively choose the auditor. Though investors can reject an auditor, they cannot effectively nominate a preferable one. In our research design we enabled investors to select an auditor from the marketplace to replace the rejected auditor. In principle, this kind of approach could be implemented in the U.S. audit market. Auditors could even prepare proposals to shareholders that provide information for investors to use to develop preferences and make meaningful auditor selection decisions.

REFERENCES

Abdel-khalik, A. R. 2002. Reforming corporate governance post Enron: Shareholders' board of trustees and the auditor. *Journal of Accounting and Public Policy* 21 (1): 97–103.

Advisory Panel on Auditor Independence. 1994. *Strengthening the Professionalism of the Independent Auditor: Report to the Public Oversight Board of the SEC Practice Section, AICPA, from the Advisory Panel on Auditor Independence*. Stamford, CT: Public Oversight Board.

American Institute of Certified Public Accountants (AICPA), Commission on Auditors' Responsibility (Cohen Commission). 1978. *Report, Conclusions, and Recommendations*. New York: NY AICPA.

———, Public Oversight Board. 1993. *In the Public Interest: A Special Report by the Public Oversight Board of the SEC Practice Section, AICPA: Issues Confronting the Accounting Profession: Litigation, Self-Regulation, Standards, Public Confidence, Professional Practice*. New York, NY: AICPA.

———. 1997. *AICPA Professional Standards*. Volume I. New York: NY AICPA.

Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees. 1999. *Report and Recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees*. New York, NY: NYSE/NASD.

Calegari, M., J. Schatzberg, and G. Sevcik. 1998. Experimental evidence of differential auditor pricing and reporting strategies. *The Accounting Review* 73 (April): 255–275.

Cony, E. 1961. CPA invasion. *Wall Street Journal* (October 30): 1.

DeAngelo, L. 1981a. Auditor independence, "low balling," and disclosure regulation. *Journal of Accounting and Economics* (August): 113–127.

———. 1981b. Auditor size and audit quality. *Journal of Accounting and Economics* (December): 183–200.

Deener, B. 2002. Auditors often victims of "kill the messenger" mentality: Many firms get the boot after delivering bad financial news. *Dallas Morning News* (March 7).

DeJong, D. V., R. Forsythe, and R. J. Lundholm. 1985. Ripoffs, lemons, and reputation formation in agency relationships: A laboratory market study. *Journal of Finance* 40 (3): 809–820.

Dopuch, N., R. King, and D. Wallin. 1989. The use of experimental markets in auditing research: Some initial findings. *Auditing: A Journal of Practice & Theory* 8 (Supplement): 98–127.

———, ———, and R. Schwartz. 2001. Independence in appearance and in fact: An experimental investigation. Working paper, Washington University, St. Louis, MO.

Dye, R. A. 1991. Informationally motivated auditor replacement. *Journal of Accounting and Economics* 14: 347–374.

Ellsburg, D. 1961. Risk, ambiguity and the savage axioms. *Quarterly Journal of Economics* 75: 643–669.

Griswold, E. N. 1955. The tax practice problem 1: A further look at lawyers and accountants. *The Journal of Accountancy* 100 (6): 29–35.

Hackenbrack, K., and M. W. Nelson. 1996. Auditors' incentives and their application of financial accounting standards. *The Accounting Review* 71 (January): 43–59.

Hilzenrath, D. S. 2001. After Enron, new doubts about auditors. *The Washington Post* (December 5): A1.

King, R. 1996. Reputation formation for reliable reporting: An experimental investigation. *The Accounting Review* 71 (3): 375–396.

Lee, C-W. J., and Z. Gu. 1998. Low balling, legal liability, and auditor independence. *The Accounting Review* 73 (October): 533–555.

Lev, B. 2002. Too gray for its own good. *Wall Street Journal* (January 22): A20.

Levitt, A. 1998. The numbers game. Speech delivered at New York University Center for Law and Business, September 28.

———. 2000. Renewing the covenant with investors. Speech delivered at New York University Center for Law and Business, May 10.

Magee, R. P., and M. Tseng. 1990. Audit pricing and independence. *The Accounting Review* 65 (April): 315–336.

Mautz, R. K., and H. A. Sharaf. 1961. *The Philosophy of Auditing.* Sarasota, FL: American Accounting Association.

Mayhew, B. W. 2001. Auditor reputation building. *Journal of Accounting Research* 39 (December): 599–617.

———, J. W. Schatzberg, and G. R. Sevcik. 2001. The effect of accounting uncertainty and auditor reputation on auditor objectivity. *Auditing: A Journal of Practice & Theory* 20 (September): 49–70.

McNamee, M. 2002. Turn up the heat on board cronyism, Mr. Grasso. *BusinessWeek* (April 22): 36–37.

O'Connor, S. M. 2002. The inevitability of Enron and the impossibility of "auditor independence" under the current audit system. Working paper, University of Pittsburgh School of Law.

Panel on Audit Effectiveness. 2000. *Report and Recommendations.* Stamford, CT: Public Oversight Board.

Previts, G. J. 1998. Auditor independence: A perspective on its origins and orientations. *Research in Accounting Regulation* 12: 299–317.

Salterio, S., and L. Koonce. 1997. The persuasiveness of audit evidence: The case of accounting policy decisions. *Accounting, Organizations and Society* 6: 573–587.

Saul, R. S. 1996. Commentary: What ails the accounting profession? *Accounting Horizons* 10 (2): 131–137.

Securities and Exchange Commission (SEC). 2000. *Revision of the Commissioner's Auditor Independence Requirements.* File no: S7-13-00, effective date February 5, 2001. Other Release Nos.: 34-43602; 35-27279; IC-24744; IA-1911; FR-56. Available at: http://www.sec.gov/rules/final/33-7919.htm.

Schatzberg, J. W., and G. Sevcik. 1994. A multi-period model and experimental evidence of independence and "lowballing." *Contemporary Accounting Research* 11 (Summer): 137–174.

Schuetze, W. P. 1994. Commentary: A mountain or a molehill? *Accounting Horizons* 8 (1): 69–75.

Schulte, A. A. Jr., F. J. Hoenemeyer, and M. M. Devore. 1967. Compatibility of auditing and management services. *The Journal of Accountancy* 124 (6): 29–39.

Stans, M. H. 1955. The tax practice problem 2: A proposed solution to the controversy. *The Journal of Accountancy* 100 (6): 36–43.

Swieringa, R. J., and K. E. Weick. 1982. An assessment of laboratory experiments in accounting. *Journal of Accounting Research* 20 (Supplement): 56–101.

Turley, J. S. 2002. Commentary: How accounting can get back its good name. *Wall Street Journal* (February 4).

U.S. House of Representatives, Committee on Energy and Commerce, Subcommittee on Oversight and Investigations. 1985. *SEC and Corporate Audits: Hearings before the Subcommittee on Oversight and Investigations and the Committee on Energy and Commerce, House of Representatives.* Washington, D.C.: Government Printing Office.

———. 2002. *The Corporate and Auditing Accountability, Responsibility and Transparency Act of 2002.* H.R. 3763. Washington, D.C.: Government Printing Office.

U.S. Senate, Subcommittee on Reports, Accounting and Management of the Committee on Government Operations (Metcalf Committee). 1977. *The Accounting Establishment: A Staff Study.* Washington, D.C.: Government Printing Office.

———. 2002a. *Auditor Independence Act of 2002.* S. 1896. Washington, D.C.: Government Printing Office.

———. 2002b. *Public Company Accounting Reform and Investor Protection Act of 2002.* S. 2763. Washington, D.C.: Government Printing Office.

United States v. Arthur Young & Co. 465 U.S. 805, 817–818 (1984).

Wallman, S. M. H. 1996. Commentary: The future of accounting, Part III: Reliability and auditor independence. *Accounting Horizons* 10 (4): 76–97.