Auditor independence, self-interested behavior and ethics: some experimental evidence

Haim Falk a, Bernadette Lynn b,*, Stuart Mestelman c, Mohamed Shehata b

a Faculty of Business, Rutgers University, Camden, NJ, USA
b Faculty of Business, Michael G. DeGroote School of Business, McMaster University, 1280 Main Street W., Hamilton, Ont., Canada L8S 4M4
c Department of Economics, McMaster University, 1280 Main Street W., Hamilton, Ont., Canada L8S 4M4

Abstract

Our paper presents the results obtained in a laboratory environment in which subjects revealed their beliefs about an uncertain state of the world and then participated in a simple task which required them to report on whether the report of a second party is consistent with the subjects' beliefs. Because maintaining prior judgements (audit independence) which were in disagreement with the second party's decision (a potential for a qualified audit opinion) were costly to the subject, a situation was created in which the subject might compromise her beliefs at a price. The results suggest that amoral, self-interested profit-maximizing behavior does not generally characterize the subjects in this experiment. Furthermore, subjects compromise their beliefs less often, i.e., breach independence, the higher their scores on a Defining Issues Test, but more often, the greater the cost of adhering to their beliefs. © 1999 Elsevier Science Inc. All rights reserved.

* Corresponding author. Tel.: +1-905-525-9140; fax: +1-905-521-8995.
E-mail address: lynnbe@mcmaster.ca (B. Lynn)

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1. Introduction

The requirement of auditor independence arises from the need to establish the independent auditor as an objective and trustworthy arbiter of the fair presentation of financial results. Indeed, Mautz and Sharaf (1961, pp. 204–231) and Berryman (1974, p. 1) posit that independence is the cornerstone of the audit profession and an essential ingredient of users’ confidence in financial statements. Since independent auditors occupy a position of trust between the management of the reporting entity and users of its financial statements, they must be perceived to be operating independently on the basis of sound auditing standards and strong ethical principles.

Examinations of the independence issue over the last three decades, such as the Metcalf (1976), Moss (1978), Cohen (1978), and Treadway (1987) Commissions and the Advisory Panel on Auditor Independence (1994) have all emphasized the importance of independence as a critical factor of professional conduct. Moreover, the US Supreme Court, in United States v. Arthur Young & Co. et al. 1984 (1986, p. 818), has ruled that the independent auditor must “maintain total independence from the client at all times”.

Codes of professional conduct, such as those of the American Institute of Certified Public Accountants (AICPA), the Canadian Institute of Chartered Accountants, and the Institute of Chartered Accountants of Ontario require that a member “in public practice be independent in fact and in appearance...” (Pany and Whittington, 1994, p. 94). Whereas the literature is replete with studies that model auditors’ decisions of whether to preserve or compromise their independence under various circumstances (Antle, 1984; DeAngelo, 1981; Goldman and Barlev, 1974; Kanodia and Mukherji, 1994; Magee and Tseng, 1990; Yoon, 1990; Penno and Watts, 1991; Yost, 1995), studies that attempt to observe independence directly are quite sparse. Furthermore, research which tries to link audit independence and ethical propensity is rare (Ponemon and Gabhart, 1990; Windsor and Ashkanasy, 1995). We report on actual observations, obtained via a controlled laboratory experiment concerning decisions to compromise or preserve independence in the case of client–auditor disagreements about a reporting decision. Outside this controlled environment these inconsistent decisions or breaches of independence are unobservable and, hence, theories about their occurrence are largely untestable using field data.

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1 This statement is from Article IV, Objectivity and Independence, of Section I of the AICPA Code of Professional Conduct (reproduced in Pany and Whittington, 1994, p. 94) and it is comparable to Section 5100.02 in the CICA Handbook, Volume II (Canadian Institute of Chartered Accountants, 1997) and to paragraphs 204.1–3 of the Institute of Chartered Accountants of Ontario Rules of Professional Conduct (1995).

2 Examples of such studies include Dopuch and King (1991), Schatzberg (1990) and Schatzberg and Sevick (1994).
Furthermore, we combine and extend two important streams in the audit literature: (1) Magee’s and Tseng’s (1990) and Antle’s (1984) analytical modeling of audit independence and (2) Ponemon’s and Gabhart’s (1990) and Windsor’s and Ashkanasy (1995) empirical tests of the relation between moral development and auditor independence.

We assume the Magee and Tseng (1990, pp. 318–320) audit framework and devise an experimental audit task which focuses on a test of whether subjects exercise independent judgment based on their prior beliefs. Because our controlled laboratory environment includes explicit monetary incentives (economic motivation) both as positive payoffs and negative penalties, we feel that the method allows us to make a more direct evaluation of subjects’ behavior and its relation to their moral development than either Ponemon and Gabhart (1990) or Windsor and Ashkanasy (1995) were able to do using their hypothetical audit case experiments. While Ponemon (1993) did attempt to link an economic decision (a free rider/Prisoner’s Dilemma situation) with moral development and ethical education, his classroom setting did not have the formal controls available in the laboratory environment. Essentially, our study uses a proxy variable for moral development to control for the potential impact of moral choice on what is largely a test of economic rationality in an audit setting. Our results show that:

1. As the probability of losing a client by disagreeing with the client’s decision increases, the frequency of independence violations increases. This result is independent of whether the independent auditors’ behavior is monitored.

2. Monitoring and penalizing independent auditors’ behavior reduce the frequency of independence violations when the probability of losing a client is small, but the frequency of violations is not reduced when the probability of the loss of a client is high.

3. On average, subjects with low moral development scores violate independence more frequently than those who have higher scores.

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3 Ponemon (1993) attempted to determine whether integrating instruction in ethics into an auditing course would improve the moral development (DIT p-scores) of auditing students. His research revealed neither a significant difference between the DIT p-scores of students before and after the ethics education intervention nor between student subjects and his control group. While his results did not show a change in moral development over the time of the auditing course, no attempt was made to determine whether the students subjected to the ethics training had a better grasp of the ethical dimensions of the audit problems they would confront in their careers. Training in ethics for independent auditors does not necessarily mean attempting to get auditors to operate on a post-conventional level (what the DIT p-score represents) but rather to get them to operate consistently with the rules of the profession (the conventional moral level). This could be one explanation why DIT p-scores and audit experience are negatively related in Ponemon (1992a, p. 175) since audit expertise and adherence to rules are related, which is more aligned with conventional moral development than post-conventional.
These results suggest that while external review and potential penalties (litigation costs, loss of reputation, direct fines or licence suspension) may reduce violations of auditor independence somewhat, the positive reinforcement of the attribute may come from increasing independent auditors’ awareness of the ethical dimensions of their decisions. Using a different research method, our results also validate Ponemon and Gabhart’s (1990, pp. 240–247) and Windsor’s and Ashkanasy’s (1995, pp. 715–717) findings on the significance of moral development to auditor independence.

The next section provides a review of the research on ethics and auditing, including a discussion of the moral development literature from developmental psychology which is used in the present study. We then provide a general framework for our study, describe the research design and hypotheses, and discuss the results of the experiment. Finally, we draw conclusions from the results and identify opportunities for extending the research.

2. Auditing and ethical background

Prior research on auditor independence has largely concentrated either on modelling the independent auditor’s judgement or on situations where auditors may breach their required independence. Studies such as Dopuch and King (1991), Schatzberg (1990) and Schatzberg and Sevcik (1994) have attempted to study the concept of independence in audit settings, but do not provide direct observations of subjects’ independence as does the present study. In the studies cited, audit independence (or lack thereof) is revealed by agreement or disagreement with management’s portrayal of a financial reporting dilemma of some description. While the studies use experimental techniques, none of them attempt to assess the independent auditor’s prior beliefs or expectations vis-à-vis the situation. Such an assessment is central to our present experimental

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4 Schatzberg and Sevcik (1994) studied auditor independence in an experimental market setting which focuses on audit fees (low-balling). Their experiments used student subjects, like ours, but they concentrated on the market driven price for audits of high and low quality which will reveal the true results of a period. Schatzberg and Sevcik (1994, p.141) also included a penalty condition in one phase of their experiment. The present research differs from Schatzberg and Sevcik (1994) in that following Magee and Tseng (1990, pp. 318–320) we assume an implicit market setting where all auditors have the same cost function with respect to the clients (who are identical). Competition in our treatment occurs only on the basis of whether the independent auditor agrees or disagrees with the client’s treatment. Hence, we have two possible market structures: (1) no replacement auditor agrees with the client and (2) at least one competitor agrees with the client. This allows us to focus our analysis of subject behaviors squarely on the independence issue without the added noise of the audit pricing phenomena.
treatment and forms the basis of determining whether a subject has behaved independently or has compromised prior beliefs.

The suggestion that when external auditors exercise independent judgement about financial statements, they are engaging in what is tantamount to an ethical act, is not a novel idea. Codes of ethics such as those used by the American Institute of Certified Public Accountants and the Canadian Institute of Chartered Accountants are normally designed to motivate members of professional organizations to operate in an ethical manner. Prior studies suggest, however, that the underlying psychology that governs professional behavior is more complicated than simply hoping that professionals adhere to the organization’s code of conduct. For example, Lampe and Finn (1992, pp. 34–55) compared the auditors’ ethical decision process model they developed to an AICPA Code decision model and concluded (pp. 55–56) that the latter is insufficient to motivate accountants to pursue ethical behavior. Similarly, Ponemon (1988, 1990, 1992a, b, 1993, 1995), Ponemon and Gabhart (1993) and Ponemon and Glazer (1990) utilized theories of cognitive-developmental psychology (described below) to elucidate the ethical dimensions of accountants’ judgement procedures and generally concluded that the ethical culture of the firm and domain-specific experience coupled with ethical reasoning are significantly related to accountants’ ethical behavior.

More specifically, Ponemon and Gabhart (1990, pp. 240–247) and Windsor and Ashkanasy (1995, pp. 709–714) have established that the degree of moral development helps to explain external auditors’ independence behavior. Cushing (1990, p. 254) expressed concern about Ponemon’s and Gabhart’s (1990) chosen scenario (a management advisory task of whether the independent auditors should help to hire a financial officer for a firm for whom they provide audit service) because it did not imply explicit, measurable economic consequences. Windsor and Ashkanasy (1995, p. 702) tried to answer Cushing’s comments by constructing an auditing case involving a materiality dilemma about an error in an accounting balance to be reported on the financial statements. Windsor and Ashkanasy (1995, pp. 702–707) also enriched their analysis by incorporating the economic environs (the client’s financial health and probability of tendering) and the independent auditor’s beliefs (level of moral development and the concept of belief in justice) as variables which influence the auditor’s exercise of independence.

Many of these studies of accounting and business ethical judgements (such as those by Ponemon cited above) are grounded in the theory of the developmental stages of moral reasoning begun by Piaget (1965) and formalized by Kohlberg (1969, 1976). Kohlberg (1976, pp. 33–35) bases his stage theory of moral development on the concept of justice by which individuals make moral judgements, a concept which changes as individuals mature and proceed through their education. Kohlberg (1969, pp. 382–391) identifies three levels of moral development each of which represents two distinct stages of moral reasoning:
Level 1, the “preconventional” level where moral reasoning is guided either by fear of punishment (Stage 1) or by self-interest, i.e., satisfying one’s own needs (Stage 2).

Level 2, the “conventional” level where moral reasoning is guided either by the wish to please or help others (Stage 3) or by the desire to fulfil societal, legal or religious norms, i.e., ruled-based reasoning (Stage 4).

Level 3, the “postconventional” level, where moral reasoning derives from either general, individual rights and socially accepted standards, i.e., a social contract (Stage 5) or from universal ethical principles as defined by the decision-maker’s conscience (Stage 6).

Kohlberg’s (1969) stage theory of moral development suggests that moral reasoning grows from a simple obedience, fear-of-punishment orientation where justice is seen as external authority to an independent judgement based on universal ethical ideals, where justice is an internal construct. In Kohlberg (1969), the concept of justice thus shifts from something externally imposed to something internally defined and mediated by the individual conscience.

Rest (1979) developed a Defining Issues Test (DIT) to assess subjects’ moral development. Elm and Weber (1994, pp. 351–354) compare the development stages described by Kohlberg (1969) and Rest (1979) and found them subtly different. The DIT has been proven to be a reliable instrument in hundreds of studies (Rest et al., 1986, pp. 28–58) and is basically a recognition task that uses a series of dilemmas (three or six stories) presented as short moral scenarios.

The DIT (Rest et al., 1986, pp. 185–200) requires participants to choose an action which they believe will resolve the dilemma and then to rank the reasons for their choice from the set of responses provided. The response set for each dilemma includes rationales based on the six stages of moral development and the test is scored by totalling the proportion of responses indicating each of the stages of reasoning. The most commonly used scores from the DIT are the p-score and the d-score. The p-score represents the proportion of stages five and six reasoning used to rationalize the dilemmas, and the d-score is a comprehensive overall score based on reasoning across all stages (Rest, 1990, pp. 4.2–4.3).

Researchers have used the DIT results to study a number of aspects of moral development across age groups, educational levels, political persuasions and across cultures. Blasi (1980, pp. 17–25) has summarized the results of using the DIT scores as a control variable in psychological experiments on cheating behavior. More recently, Trevino and Youngblood (1990), Elm and Nichols (1993), Ferrel and Skinner (1998), Laczhiak and Interredian (1987), and Singhapakdi and Vittel (1990) have used the DIT results as one of the

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5 Rest et al. (1986, pp. 1–27) provides an exhaustive summary and critique of research in these areas.
explanatory variables for studies of managerial behavior in business settings, focusing mainly on the issues such as kickbacks, cheating on business expenses, and knowledge of faulty products. Ponemon (1990, 1992a, 1995) has undertaken several studies which analyze the association between moral development (via the DIT) and professional accountants’ behavior. Ponemon and Gabhart (1990) and Windsor and Ashkanasy (1995) both use the DIT scores as the proxy for moral development in their studies of auditor independence.

Church et al. (1994) used DIT scores in an experiment assessing the relative strength of altruism versus economic self interest. Our study goes beyond previous studies by using DIT scores as a control variable to proxy moral development to determine whether subjects’ moral reasoning has a moderating effect on strict economic rationality. We consider the moral dimension in an audit experiment, testing, inter alia, whether higher moral development, i.e., a higher d-score, results in more independent audit choices. 6 The model of auditor independence that forms the basis of our laboratory experiment thus provides a direct test of whether subjects’ behavior is driven solely by economic rationality or is moderated by their degree of moral development. Having reviewed the ethical and auditing background to our study we next look at the general framework we use and then describe the actual conduct of the experiment.

3. General framework

The setting in our experiment captures an important aspect of the naturally occurring audit environment and follows the general pattern of prior analytical studies (e.g., Magee and Tseng, 1990) in which a client prepares financial statements and chooses reporting practices from available alternatives. 7 In our experiment, an independent auditor is hired to perform the mandatory audit and to express an opinion whether the financial statements present fairly the

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6 We use the DIT d-score rather than the more common p-score. The d-score is a comprehensive measure which can reflect moral development as a continuous variable (Rest et al., 1986, pp. 196–200). Other studies in this area, notably Ponemon and Gabhart (1990) and Windsor and Ashkanasy (1995) used the DIT p-score as their moral development variable. We want a measure of moral development which includes all of the responses a subject makes to the Defining Issues Test rather than only the proportion of responses consistent with post-conventional reasoning (the highest levels of moral development identified by the DIT). Based on the definitions of the p-score and the d-score (Rest et al., 1986, pp. 196–200), we note that the p-score does not permit differentiation between a subject who reaches moral development Levels 3 and 4 from one who is consistently at Levels 1 and 2 but the d-score provides an average measure over all levels of reasoning used by the subject in completing the DIT instrument. Therefore the d-score is a more appropriate measure than the p-score in the present context.

7 For the purpose of our experiment, and for the sake of generality, we do not distinguish between prescribed accounting choices and those which are not prescribed.
client’s financial position. Audit contracts are not binding for more than one period, but it is expected that, in the absence of a client–auditor disagreement that the audit contract will be renewed periodically. In contrast to DeAngelo (1981) and consistent with Elitzur and Falk (1996a) we assume that the entire expected engagement period is finite. 8

As in Penno and Watts (1991, p. 207) we define “an independent auditor as one whose preferences over financial reporting alternatives are unaffected by management’s preferences”. When the client’s reporting practice does not match the independent auditor’s preference, a client–auditor disagreement occurs, which may result in compromising independence if the auditors remove their objection to the client’s choice. If the conflict is not resolved the auditor will qualify the opinion on the client’s financial statements.

If independent auditors are assumed to be rational profit maximizers, their decision to compromise independence depends on whether the expected cost of preserving independence outweighs the expected benefits from compromising it. In the absence of external intervention, such as lawsuits by a third party or disciplinary action by oversight bodies, if the independent auditors compromise their independence they are retained by the client for future audit engagements. Where the independent auditors face a probability of peer review that may reveal the breach, the decision to compromise independence may result in costly disciplinary sanctions, loss of reputation and market share. If external auditors preserve independence, and qualify their report, they face a threat of dismissal by their clients, which involves loss of future audit fees and a possible reputation effect arising from the loss of their clients. In a mandatory audit environment, however, a client’s threat of dismissal may be credible only if there is at least one competing independent auditor who does not object to this client’s reporting choice.

While independent auditors are expected to behave as rational economic agents, it is possible that their decisions are also affected by their moral perspective. When moral behavior conflicts with economic rationality, independent auditors with higher moral reasoning are expected to exhibit more consistent, independent behavior than those with lower moral reasoning, even in the absence of monitoring and penalties. As Ponemon and Gabhart (1990, pp. 240–244) and Windsor and Ashkanasy (1995, pp. 711–712) have shown, moral development has some relation to independent audit judgement.

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8 External auditors are assumed to be hired based on their relative efficiency with respect to the client (Simunic, 1980, pp. 179–180). When significant changes in either the client or the external auditor’s operation occur (e.g., mergers, technological changes, listing on an exchange etc.) the client–auditor match may no longer be optimal and the audit contract is terminated. Consistent with low-balling literature (see Elitzur and Falk, 1996b, pp. 43–46, for discussion) the expected termination date is assumed to be predictable (see also Stice, 1991). Furthermore, some countries, such as Italy, practice mandatory rotation of auditors (Schilder, 1994, p. 82).
Membership in a professional accounting organization, one of whose requirements is adherence to a code of professional ethics, adds an additional bonding element to the client–auditor relationship (Watts and Zimmerman, 1986, p. 312; Matthews, 1991, pp. 739–740). Indeed, intensified peer reviews (Yoon, 1990, p. 269; Advisory Panel, 1994, p. 5) and stiff penalties for compromising independence provisions have been suggested as a means of enhancing auditor independence (Goldman and Barlev, 1974, p. 714; Ponemon and Gabhart, 1990, p. 286; Shockley, 1982, p. 133; Elitzur and Falk, 1996a, pp. 256–258; Windsor and Ashkanasy, 1995, pp. 716–718). In this context we examine the independent auditor’s behavior in three client–auditor disagreement settings. A description of the auditing context of the settings follows.

In each setting we assume a finite total engagement period. As in Magee and Tseng (1990, pp. 318–320) we distinguish between the cases where there are and where there are not replacement auditors available. In the baseline setting there is no replacement independent auditor available. In the two other settings we assume that there is at least one competing independent auditor who agrees with the client and who is as efficient as the incumbent auditor with respect to the client’s audit. Similar to Magee and Tseng (1990, p. 329) we assume that the price of the periodic audit by an incumbent auditor will be $M_t = v + \beta_t$, where $M_t$ is the audit fee for period $t$, $v$ is the normal audit cost that is the same for all equally efficient auditors, and $\beta_t$ is the learning cost that a competing auditor must assume and incorporate in a bid for an audit in period $t$. Because the alignment between the client’s and incumbent independent auditor’s information systems increases over time (Antle 1982, pp. 506–508; 1984, pp. 8–10), $\beta_t$ is increasing over time and $M_t$ is increasing over time. We, therefore, structured the periodic expected income to the incumbent independent auditor accordingly.

However, under the realistic assumptions that the marginal learning cost to a competitor is less than the normal audit cost and that any penalty for compromising independence is not increasing over time, the total expected payoff to the incumbent independent auditor, from the remaining total audit engagement, is decreasing over time. To maintain consistency across settings,

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9 By switching to another independent auditor the client also incurs a switching cost. In the case of a switch that is prompted by auditor–client disagreement or disciplinary action such a cost may include the loss of reputation and charges by the replacement auditor to reflect the riskiness of the client. In the interest of simplicity we do not explicitly consider the switching cost to the client. Incorporating a constant switching cost would not alter our representation of the audit fee in this experiment.

10 The above fee structure does not consider low-balling. Under low-balling conditions the fee structure would have been represented as $M_t = M_c + \phi$, where $M_c$ and $\phi$ are the minimum fee charged by a replacement auditor and switching cost to the client respectively (Elitzur and Falk, 1996b, p. 66). Assuming that $M_c$ is not negative and the pattern of $\phi$, which includes $\beta_t$, is similar to $\beta_t$, the explicit consideration of low-balling would not alter the pattern of the fee structure that we employ in the experiment.
we used the same structure of periodic income from fees in all three settings. The three settings created in the laboratory are described below.

- **Setting 1**: There are no penalties against preserving independence (no competing independent auditor who may side with the client is available). When the client cannot threaten contract termination, as is the case, for example, in France and Spain where the auditor must be retained by law for a minimum number of years there is no cost difference between a qualified and unqualified report regardless of what the client reports (Coopers & Lybrand, 1991, pp. 1-32, S-56). ¹¹ This holds for each period of the audit engagement.

- **Setting 2**: There is a positive probability that the independent auditor will lose the client if the auditor chooses to qualify the report (there is one competing auditor who sides with the client). Regardless of what the client reports, the independent auditor’s expected profit is greater if an unqualified report is issued than if a qualified report is issued. This holds for each period of the audit engagement. However, given the discussion about the $T$ period engagement, the differences between the expected profits associated with a qualified report and an unqualified report fall over time.

- **Setting 3**: There is a positive probability that, in addition to the threat of termination which characterizes Setting 2, the independent auditor may be peer reviewed and will be penalized (a threat of external review) when found to have compromised independence. When the client’s report is inconsistent with the independent auditor’s belief, the relationship between the economic values of issuing a qualified report versus an unqualified report is not the same across the periods of the audit engagement. In the first period, for example, the cost of an unqualified report to the independent auditor will be the loss of the client plus a penalty if the independent auditor is peer-reviewed, while a qualified report will only result in losing the client because of the disagreement. The expected cost of issuing a qualified report will be greater than the cost of issuing an unqualified report. In the last period, however, there is no cost to issuing a qualified report, but there is still a cost associated with issuing an unqualified report because of the potential peer-review. Between the first and last period, the differences between the expected costs of issuing a qualified or unqualified report will switch from positive to negative. Whether the economic value of an unqualified report is greater than, equal to or less than the economic value of a qualified report depends upon the probability of peer review, the penalty if the auditor is found compromising independence, the probability that the auditor will lose the client if a qualified report is filed, and the period during the audit engagement in which the report must be issued.

¹¹ See Falk et al. (1997, p. 6) for possible consequences of the retention regulations enforced in various countries on auditor independence.
In Setting 1 the independent auditor’s choice between filing a qualified or unqualified report when a client’s decision is inconsistent with the independent auditor’s belief cannot be determined on economic grounds alone. The extent to which the independent auditor’s beliefs are relevant to the auditor’s decisions will be important. In Setting 2 the independent auditor’s decision could be made solely on economic grounds, however, the independent auditor’s beliefs could introduce an opposing influence to the economic incentives and lead to a different outcome than would amoral, self-interested, profit-maximizing decision-making. Finally, in Setting 3, predictions about the independent auditor’s behavior and the role of beliefs and economic gain cannot be made without more detailed information about the auditor’s environment. Changing settings permits tests of how subjects respond to changes in the probability of losing a client or in the probability of being caught. But without introducing the multi-period decision cycles it is not possible to create an environment in which the threat of losing a client is credible. In addition, this provides an opportunity to change the cost of maintaining independence without changing the underlying probability of losing a client.

Section 4 introduces the research design and procedures we will follow to operationalize the more general framework which is comparable in nature to independent auditor’s decisions in a naturally occurring environment.

4. Research design and procedures

4.1. Design

We designed a controlled laboratory experiment to test self-interested choice behavior in a quasi-auditing task. The design involved three discrete sessions with no overlap of subjects, allowing us to examine both within group and between group observations under the three settings: (1) no threat of client loss, (2) threat of client loss, and (3) threat of client loss with external intervention and penalties.

Three sessions were conducted at the University of the Philippines in the summer of 1995 using subjects recruited from the undergraduate business program. Each session was identical in all respects except that under Settings 2 and 3, the probability of losing a client if the auditor disagreed with the client.

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12 This project attempts to identify the role of beliefs and economic incentives in decision-making. This is an important issue in evaluating the performance of an independent auditor. There is no reason to expect that business students are any more or less influenced by their beliefs than are practicing auditors. The laboratory evidence is not large, but Davis and Holt (1993, p. 17) point out that “…the behavior of decision makers recruited from naturally occurring markets … has not typically differed from that exhibited by more standard (and far less costly) student subject pools.”
was manipulated at three levels (between groups condition). For session 1 the probability was 10%, for session 2, 25% and for session 3, 40%. We introduced the escalating probabilities of client loss between the sessions to increase the motivation for subjects to make inconsistent choices (compromise independence) since the potential for lost payoffs rose as the probabilities increased. As well, the variation of probabilities of client loss allowed us to test the effect of external intervention and penalties on the behavior of subjects (between groups) facing different potential client loss functions.

4.2. Procedures

At each of the three sessions conducted, the subjects were assigned seats as they arrived. Seats were organized in a classroom setting and were separated sufficiently to prevent face-to-face contact between subjects and to maintain privacy.

Professor Shehata (one of the co-authors) explained the environment to the subjects and provided them with written instructions. Subjects were told that while their earnings in the game would be assigned in laboratory currency called francs, the francs that they earned would be converted into Philippine pesos at the end of the session. As part of the instructions, Professor Shehata also communicated the exchange rate to convert francs to pesos. 13

After explaining the compensation scheme to the subjects, Professor Shehata described the decisions the subjects were to make. Professor Shehata told subjects that they were to assume the role of a reviewer who has been hired by the owners of a firm to examine whether the firm’s manager’s production decisions have been appropriate, given the production environment. For each firm, one of two products (X or Y) can be produced depending on the production environment. If the production environment is good then producing product X would maximize the owner’s wealth. If the condition is bad, then product Y is the optimal production choice. The environment condition is expected to last for a complete business cycle of four periods. Owners are unable to predict ex ante which product should be produced to maximize their wealth. Managers might find it in their best interests to produce inappropriate products (from the owner’s perspective) or to change products from period to period.

13 Although neither the fees received by subjects per client per period nor the probability of peer review varied across sessions, the probabilities of losing a client in disagreement did differ across sessions. Because of this, a subject whose behavior was governed by expected profit maximization would have different expected franc incomes in the three sessions. The exchange rate for converting laboratory francs into Philippine pesos was adjusted to make the expected peso income comparable across sessions.
period within a cycle. The subject reviewers, who knew the probability that a production condition was *good*, were told that their task was to monitor and validate the appropriateness of the managerial production decision on behalf of the owners. They were told explicitly that they represented the owners of the firm and were to operate to insure the owner’s interests.

Subjects were then told that the experiment would proceed in three settings. Each setting consisted of two or more replicate cycles, each cycle consisting of four periods. Subjects were given a brief overview of the Setting/Cycle structure but were neither told in advance about the number of cycles in each setting nor about the differences between settings.

4.2.1. Setting 1: two cycles with no penalty and no external review

Setting 1 serves as a base line for the experiment, giving the subjects an opportunity to learn the environment and providing control data for the manipulations between groups and across a single group between Settings 2 and 3.

Before the beginning of each cycle of four periods, Professor Shehata distributed decision sheets to the subjects that provided them with information about the probability of a *good* production environment for the current cycle (e.g., a 90% chance of a *good* environment versus a 10% chance of a *bad* one). Subjects were asked to decide which product, *X* or *Y*, should be produced to maximize the owner’s wealth and to record their decision on the record sheet that was provided. The record sheets were then collected from the subjects before the cycle began. In this way we know the subjects’ beliefs before they are informed of their clients’ decisions. This procedure permits us to identify violations of audit independence. In practice independent auditors’ beliefs are not known before they render their opinion on management’s reports.

The *X* and *Y* products serve as surrogates for alternative accounting treatments. For example, consider a transaction for which an accounting treatment is prescribed by an accounting standard. The independent auditor must decide whether the accounting treatment chosen by the manager is consistent with the standard. If it is not, then the financial report may trigger litigation and penalties which will reduce the owner’s wealth. By virtue of their stewardship

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14 The implicit agency model underlying the owner/auditor/manager relationship in our settings suggests that the manager’s decision to produce *X* or *Y* is based on some effort/reward tradeoff in his or her utility function which is invoked in his response to the production environment. Since the manager is a shadow construct in our experiment no explicit reference is made to his compensation scheme or his objective function other than that is related to the auditor (monitor) attesting positively to the manager’s production choice. As in the traditional agency model (see Stiglitz, 1989), our *owners* are unable to observe the manager or the production environment directly. Hence, they hire the independent auditor to obtain the knowledge necessary to attest to the appropriateness of the manager’s actions. Like the manager, the owner is a hypothetical construct in our experiment who is necessary to create the appropriate motivation for the auditor subjects.
relations with the company, managers are expected to choose a prescribed treatment that should also be consistent with the independent auditor’s belief. When an accounting treatment for a certain transaction is not prescribed by a standard, then the manager is expected to choose a treatment that maximizes the owner’s wealth. For example, when a debt covenant restricts the magnitude of a Total Debt to Total Assets ratio, then an accounting treatment that reduces this ratio should be preferred to a treatment that increases or does not change the ratio. This is analogous to our laboratory task where, if the production of $X$ increases the owner’s wealth and the production of $Y$ decreases it, the manager should choose $X$ over $Y$. If the manager chooses $Y$ and the independent auditor believes that $X$ should be chosen, then the independent auditor should report on the disagreement. If the manager chooses $Y$ and this is consistent with the auditor’s belief, the independent auditor should report on the agreement.

At the beginning of a cycle, each subject was given the evaluation sheet displayed as Fig. 1 containing three client files. Subjects were told that the three client firms were identical in every respect and hence were expected to produce the same product, given the production environment. In each period the experimenter communicated the actual product produced by each client firm by

<table>
<thead>
<tr>
<th>CYCLE</th>
<th>MANAGER FOR CLIENT</th>
<th>FEES PER CLIENT</th>
<th>TOTAL FEES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period 1</td>
<td>Product Evaluation</td>
<td>X Y Y</td>
<td>10 Francs</td>
</tr>
<tr>
<td>Period 2</td>
<td>Product Evaluation</td>
<td></td>
<td>15 Francs</td>
</tr>
<tr>
<td>Period 3</td>
<td>Product Evaluation</td>
<td></td>
<td>20 Francs</td>
</tr>
<tr>
<td>Period 4</td>
<td>Product Evaluation</td>
<td></td>
<td>25 Francs</td>
</tr>
<tr>
<td></td>
<td>Total Fees for this cycle (please post this amount on the INCOME SUMMARY SHEET)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 1. Evaluation sheet used by participants in sessions.
writing it on the chalkboard. Subjects were then asked to decide whether to agree or disagree with the managers of each of the three firms. If they agreed (disagreed), they wrote A (D) beneath the designated product on the evaluation line. Subjects received a fee of ten francs for reviewing each client file in period 1. This fee increased by five francs per period per file reviewed, regardless of whether they decided to agree or disagree with the manager’s decision. This proxies the audit fee ($M_t$) described in the previous section.

4.2.2. Setting 2: five cycles with penalty and no external review

Instructions for Setting 2 of the experiment replicate Setting 1 except that subjects were told that although they still represented the client owner, they could now be dismissed by the manager if they disagreed with his production decision in any period.

The probability of being dismissed was manipulated between groups in the three sessions, that is, one session’s subjects were assigned a 10% probability of dismissal, the second session a 25% probability and the third a 40% probability. The decision whether a subject would lose a client after a disagreement was implemented using a random draw of a card. If the result of the card draw indicated that the subject was dismissed, the subject received a fee for the current period but lost the client for the remainder of the cycle. There was a single draw for all subjects. To ensure that subjects understood the monetary consequences of a dismissal, they were provided with a table showing the expected cost of losing a client in every period. These values are presented in Table 1. Subjects began each cycle with a complete set of clients regardless of their losses in previous cycles.

4.2.3. Setting 3: four cycles with penalty and external review

Setting 3 replicates Setting 2 with one modification. Subjects were told that in addition to their potential loss of a client there was also a 20% chance that their decisions would be reviewed by the experimenter.

The objective of Setting 3 is to examine whether the subject’s behavior is affected when there is a likelihood of external review which includes a penalty for behavior which is inconsistent with the subject’s true belief about the proper production decision. This external review and penalty structure operates as a

\[ \text{predicted outcomes are not affected by this simplification.} \]
Table 1
Expected cost of independent auditor’s action

<table>
<thead>
<tr>
<th>Client’s choice</th>
<th>Independent auditor issues an unqualified report</th>
<th></th>
<th>Independent auditor issues a qualified report</th>
<th></th>
<th>Setting 2 by probability of losing client through disagreement</th>
<th>Setting 3 by probability of losing client through disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Setting 1</td>
<td></td>
<td>10%</td>
<td>25%</td>
</tr>
<tr>
<td>Period Setting</td>
<td>Setting 1</td>
<td>Setting 2</td>
<td>Setting 3</td>
<td>Setting 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Consistent with auditor’s belief</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4.5</td>
<td>11.25</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Inconsistent with auditor’s belief</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>13.0</td>
<td>0</td>
<td>6.0</td>
<td>15.00</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>10.5</td>
<td>0</td>
<td>4.5</td>
<td>11.25</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>7.0</td>
<td>0</td>
<td>2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: In setting 1 there is no chance of losing a client through disagreement and there is no peer review. In setting 2 there is a chance of losing a client through disagreement but there is no peer review. In setting 3 there is a chance of losing a client through disagreement and there is a chance of peer review. The costs on this table reflect the client fee schedule in Fig. 1, the decision period, the probability of losing a client by disagreement and the probability of peer review. For example, when the independent auditor must report on a client who has made a report which is inconsistent with the auditor’s belief in period 2 of setting 2 when there is a 40% chance of losing the client by disagreement, the cost of disagreeing is the sum of the francs lost if the client discharges the auditor (20 francs for period 3 and 25 francs for period 4) multiplied by the probability that the client will discharge the auditor by issuing a qualified report. In this case 45 is multiplied by 0.40 to give an expected cost of issuing a qualified report of 18 francs. All of the expected costs reported in this table are computed in a similar fashion.
surrogate for institutions such as a court order or the peer review of an independent auditor’s working papers and the disciplinary action which ensues when an independent auditor has been found to be in violation of a standard such as preserving independence. Professor Shehata decided whether to review the subjects’ decisions by drawing a card from a deck numbered from one to twenty. If the card drawn was one to four, a review would be conducted, otherwise not. If a subject was reviewed and found to have agreed with the manager’s decision to produce an inappropriate product, a choice inconsistent with the subject’s pre-cycle decision, then the subject lost half of the client-related fee for the current period, and lost the client for subsequent periods. As in Setting 2, Professor Shehata provided the subjects with a schedule of their expected costs (losses) under all possible decisions in each period of the cycle to ensure that they understood the monetary consequences of their actions. These are shown in Table 1.

Five weeks before conducting the experiments, the subjects completed the six dilemma DIT instrument in a classroom setting, supervised by Professor Shehata. Subjects were told that the objective of the DIT was to help Professor Shehata to understand the way in which people reason in certain situations. Subjects were told that the DIT was not an exam and that there were no right or wrong answers to the dilemmas. Subjects were paid a flat fee of 50 pesos for completing the DIT, an exercise that takes about 75 min. The 50 peso compensation was equivalent under Philippine economic conditions to a Canadian student receiving about three times the minimum hourly wage in compensation. The DIT scores are incorporated into the analytic model as a covariate to test whether the subjects’ self-interested behavior was moderated by a measure of their moral development.

We have described the general framework of the problem in which we are interested, the parameters which characterize the laboratory environment, and the conduct of the experiment. We now turn to a discussion of specific hypothesis tests.

5. Hypothesis tests

In Setting 1 there is no chance that independent auditors who remain consistent with their beliefs can lose clients and no chance that they will be

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16 During the experiment, we avoided using accounting, auditing or ethical references in relation to the experimental task. Every effort was made to create a decision environment which mimicked a simple audit task without revealing the nature of the task. This was done to avoid prior beliefs about accounting and auditing contaminating subjects’ behavior. The ethical implications were handled similarly.
punished for inconsistent behavior. Assuming independent auditors are amoral suggests that they are just as likely to agree with the client as to disagree with the client regardless of the client’s decision. Relaxing the assumption of amoral behavior on the part of independent auditors amends the prediction. In this setting, the independent auditor’s action should be independent of whether the client’s choice is consistent or inconsistent with the independent auditor’s belief and the auditor should preserve independence (an independent auditor is more likely to issue an unqualified report when the client’s choice is consistent with the auditor’s belief and issue a qualified report when the client’s choice is not consistent with the auditor’s belief). This is a baseline test of the behavior of the subjects participating in this experiment and suggests

**H₁:** When maintaining or violating auditor independence is costless, the external auditor is more likely to maintain auditor independence.

In Settings 2 and 3 it is possible for an independent auditor to lose a client if the auditor issues a qualified report. It is also possible for an independent auditor to lose a client (and incur a penalty) if the auditor violates independence and is discovered in violation following a peer review. While the former condition will increase the likelihood of an unqualified report, the latter offsets this likelihood.

Given the expected costs presented in Table 1, the amoral, self-interested, expected-profit maximizing auditor should always issue an unqualified report in periods 1–3 of Setting 2 for all probabilities of losing a client through disagreement. The independent auditor also should issue unqualified reports in periods 1 and 2 of Setting 3 for the probabilities of 25% and 40% of losing a client through disagreement, and in period 3 of Setting 3 for the probability of 40%. The independent auditor should be indifferent between issuing a qualified or unqualified report in the final period of Setting 2. In the remaining seven conditions the independent auditor should issue a qualified report. Relaxing the amorality assumption suggests that the prediction of an unqualified report may be mediated by a desire to maintain independence by adhering to what the auditor knows is the correct choice for the client–manager relative to the owner’s interest. Furthermore, as the probability of losing a client through disagreement rises, the difference between the expected cost of issuing a qualified report and the expected cost of issuing an unqualified report increases. Therefore the cost of maintaining independence increases. This leads to

**H₂:** As the difference between the expected cost of issuing a qualified report and the expected cost of issuing an unqualified report rises, the frequency with which auditor independence is violated rises.

The final hypothesis addresses directly the relationship between the frequencies with which independence is preserved and the subjects’ DIT d-scores.
Higher DIT scores reflect greater moral development and are expected to be associated with fewer instances of compromised independence and therefore

H₃: The frequency with which auditor independence is preserved is greater for subjects with higher DIT scores than for subjects with lower DIT scores.

6. Analysis of results

Table 2 presents a summary of aggregated data from Settings 1, 2 and 3. These data are disaggregated according to the probability that an auditor loses a client by filing a qualified report for Settings 2 and 3 and presented in Table 3. Table 4 presents aggregated data by setting and by time period within the cycle. Table 5 presents the results of a probit analysis in which the dependent variable is whether or not the independent auditor violates the predetermined belief, and the independent variables are the probabilities of losing a client by issuing a qualified report, the setting, interactions between the probabilities of losing a client and the setting, and the auditor’s DIT score. This regression analysis provides estimates of the probability that independence will be violated by setting and the probability that a qualified report will cost the auditor the client and a measure of the moral development of the auditor, as reflected by the DIT score. These estimates are provided in Figs. 2–4 over a range of DIT d-score values, across the three settings, and for the different probabilities of losing a client by filing a qualified report.

Tests of Hypothesis 1 are presented in Section 6.1. Three different tests of Hypothesis 2 are presented in Sections 6.2–6.4. Section 6.2 compares changes from Settings 1 to 2, Section 6.3 compares changes from Settings 2 to 3, and Section 6.4 uses the intertemporal data for Settings 1 to 3. Finally, Section 6.5 contains tests of Hypothesis 3.

6.1. Baseline hypotheses

The baseline hypothesis (H₁) can be tested with the data from Table 2. The frequencies with which independence is preserved (in 98.1% and 95.3% of the observations) are significantly greater than the frequencies with which they are compromised (one-tail binomial test, \( p = 0.000 \)). Something other than self-interested profit-maximizing behavior is driving the choices of subjects in these sessions. The strength with which independence is preserved suggests that the subjects’ beliefs may provide a viable focal point for decision-making.

It is interesting to note that although the magnitudes of the proportions of observations in which independence is preserved both exceed 0.95, their difference (0.028) is statistically significant (\( \chi^2(1) = 8.455, p = 0.004 \)). This suggests that even though there is no cost to issuing a qualified report, some individuals
Table 2
Percentage (and number) of decisions in which audit independence was preserved or compromised, given the client’s choice and the setting

<table>
<thead>
<tr>
<th>Client’s choice</th>
<th>Setting 1 independence</th>
<th>Setting 2 independence</th>
<th>Setting 3 independence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preserved</td>
<td>Compromised</td>
<td>Preserved</td>
</tr>
<tr>
<td>Consistent with independent auditor’s belief</td>
<td>98.1</td>
<td>1.9</td>
<td>99.7</td>
</tr>
<tr>
<td></td>
<td>(918)</td>
<td>(18)</td>
<td>(2259)</td>
</tr>
<tr>
<td>Inconsistent with independent auditor’s belief</td>
<td>95.3</td>
<td>4.7</td>
<td>73.1</td>
</tr>
<tr>
<td></td>
<td>(427)</td>
<td>(21)</td>
<td>(705)</td>
</tr>
</tbody>
</table>

Notes: In Setting 1 there is no chance of losing a client through disagreement and there is no peer review. In Setting 2 there is a chance of losing a client through disagreement but there is no peer review. In Setting 3 there is a chance of losing a client through disagreement and there is a chance of peer review.
will accommodate others at the expense of their own beliefs if someone else’s beliefs conflict with their own. In the case when compromising one’s beliefs is itself an inconsistent action (the client’s decision is consistent with the auditor’s belief, and so there is no reason to issue a qualified report), 1.9% of the subjects’ decisions are to produce a qualified report. If this is interpreted as a measure of random mistakes made by subjects in this experiment, then the cases in which independence is compromised when the client’s decision is inconsistent with the auditor’s belief in Setting 1 are significantly different from random noise.

Because the frequency with which independence is compromised is for all intents and purposes zero when the client’s decision is consistent with the independent auditor’s belief (across Settings 2 and 3 subjects compromised independence in fewer than 0.3% of the 4090 times that clients’ choices were consistent with subjects’ beliefs), the remainder of the analysis concentrates on the situations in which the client’s decision is inconsistent with the independent auditor’s belief. It is in these instances that it is meaningful to analyze the factors which affect the frequency with which auditors may compromise independence.

6.2. Costly beliefs but costless compromise

Hypothesis 2 (H2) implies that the change from Setting 1 to 2 should lead to a reduction in the proportion of times that independence is preserved. The aggregate data in Table 2 show that the proportion of times that the external auditor’s independence is preserved falls from 0.953 in Setting 1 to 0.731 in Setting 2. This difference is significant ($\chi^2(1) = 95.12, p = 0.000$) and provides support for the hypothesis.

Nearly three-quarters of decisions made by independent auditors in Setting 2 preserve independence. This is significantly greater than random behavior, for which only 50% would be consistent with preserving independence (one-tail binomial test, $p = 0.000$). This suggests a strong tendency to preserve independence in spite the relative cost.

Increases in the cost of maintaining beliefs may result in increases in the frequency with which independence is compromised. The data from Setting 2, disaggregated by the probability of losing a client through disagreement, is summarized in Table 3. The data indicate that as the cost of preserving independence rises, the proportion of times that independence is violated rises. Pair-wise comparisons of the differences of these proportions are significant ($\chi^2(1) > 6.601, p < 0.010$ for each hypothesis test) and, therefore, provide support for H2.

In summary, the evidence suggests that if qualified reporting is costly to the independent auditor, auditor independence is likely to be compromised. As the cost of qualifying a report increases, violations of the auditor’s independence will increase.
6.3. Costly beliefs and costly compromise

The aggregated data in Table 2 show that the proportion of times that the auditor’s independence is preserved rises from 0.731 in Setting 2 to 0.826 in Setting 3. This difference is significant ($\chi^2(1) = 22.064, p = 0.000$) and supports H2 which says that auditor independence will increase as the cost of violating independence rises.

The data from Session 3, in Table 3, indicate that as the probability of losing a client by issuing a qualified report rises from 10% to 25% to 40%, the percentage of times independence is compromised rises from 0% to 14% to 42%. These values are significantly different from one another ($\chi^2(1) > 38.284, p = 0.000$ for each of the three pair-wise tests) and provide support for H2.

The evidence from the laboratory sessions again indicates that as the cost of qualifying a report increases, violations of the auditor’s independence will increase. However, if the independent auditor can suffer a cost by compromising independence it is possible that some of the impact of costly qualified reporting may be offset and the frequency of compromised independence may fall. The strength of this effect is directly related to the probability of losing a client by issuing a qualified report and the probability of being discovered compromising independence.

It is difficult to evaluate the effect of introducing an uncertain external review because the impact on the cost of issuing a qualified report relative to an unqualified report changes over time. The period-by-period comparison of decisions made in Setting 2 with those in Setting 3 is discussed in Section 6.4.

6.4. Intertemporal decisions

Table 4 reports the percentage of decisions in which audit independence was preserved given the client’s choice was inconsistent with the auditor’s belief. The data are presented by time period, by setting, and by the probability of losing a client. Because the subjects in each session faced the same

<table>
<thead>
<tr>
<th>Chance of losing a client</th>
<th>Setting 2</th>
<th>Setting 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Total</td>
</tr>
<tr>
<td>10%</td>
<td>17</td>
<td>248</td>
</tr>
<tr>
<td>25%</td>
<td>25</td>
<td>432</td>
</tr>
<tr>
<td>40%</td>
<td>38</td>
<td>285</td>
</tr>
</tbody>
</table>

*Notes: In Setting 2 there is a chance of losing a client through disagreement but there is no peer review. In Setting 3 there is a chance of losing a client through disagreement and there is a chance of peer review.*
Setting 1 conditions, these data are pooled. Settings 2 and 3 data pooled across sessions (and therefore probabilities of losing a client) are also presented.

6.4.1. Setting 1
The data in Table 4 support the hypothesis that independent auditors preserve independence more often than they compromise independence (one-tail binomial test, \( p = 0.000 \)). Also, over the four periods the proportion of times that independence was preserved varied between 0.973 and 0.911. These proportions are statistically different from one another (\( \chi^2(3) = 6.452, p = 0.105 \)). Thus, the results from Setting 1 show strong support for preserving independence.

6.4.2. Setting 2
For the 10% probability level of losing a client, the data for Setting 2 in Table 4 show that the proportion of decisions which preserve independence is much greater in each period than would be expected from random decision-making (one-tail binomial test, \( p = 0.000 \)). However, the data do not support the proposition that subjects will display a rising proportion of reports over time which preserve independence (\( \chi^2(3) = 0.786, p = 0.853 \)). The proportions of support range from 0.800 to 0.857 and do not differ significantly from each other.

When the probability of losing a client is 25% in Setting 2, the proportion of decisions which preserve independence in each period is again greater than would be expected from random decision-making. In contrast to the results in the preceding paragraph, however, the proportions of decisions which support independence rise over time (from 0.552 to 0.940) and are statistically different from one another (\( \chi^2(3) = 46.130, p = 0.000 \)).

Finally, the pattern of observations in Setting 2 when the probability of losing a client is 40% is similar to that for the 25% probability of losing a client, except that the proportions for periods 1–4 which increase from 0.553 to 0.726 are not statistically different from one another (\( \chi^2(3) = 4.759, p = 0.190 \)).

In summary, the aggregated data for Setting 2 in Table 4, pooled over all probabilities of losing a client, support H2 (\( \chi^2(3) = 36.419, p = 0.000 \)). The disaggregated data, however, provide weak support for H2. Although the direction of changes generally are consistent with the hypothesis, the statistical support is not strong.

6.4.3. Setting 3
Based on Table 1, participants in Setting 3 should qualify their reports when the probability of losing a client by filing a qualified report is 10% and the client’s choice is inconsistent with the auditor’s belief. The data on Table 4 support this hypothesis.

Given the costs in Table 1, when the probability of losing a client rises to 25%, the independent auditor is expected to file unqualified reports in periods 1 and 2 and qualified reports in periods 3 and 4 whenever a client makes a decision
Table 4
Percentage of decisions in which audit independence was preserved given the client’s choice was inconsistent with the auditor’s belief, by time period in cycle, setting, and probability of losing the client

<table>
<thead>
<tr>
<th>Cohort (probability of losing client)</th>
<th>Time period</th>
<th>Setting 1</th>
<th>Setting 2</th>
<th>Setting 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percent</td>
<td>Total decisions</td>
<td>Percent</td>
</tr>
<tr>
<td>Pooled</td>
<td>1</td>
<td>96.4</td>
<td>112</td>
<td>61.4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>97.3</td>
<td>112</td>
<td>72.2</td>
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<tr>
<td></td>
<td>3</td>
<td>96.4</td>
<td>112</td>
<td>78.0</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>91.1</td>
<td>112</td>
<td>85.1</td>
</tr>
<tr>
<td>10%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: In Setting 1 there is no chance of losing a client through disagreement and there is no peer review. In Setting 2 there is a chance of losing a client through disagreement but there is no peer review. In Setting 3 there is a chance of losing a client through disagreement and there is a chance of peer review.
which is inconsistent with the auditor’s belief. This prediction is not supported by the data. There is, however, once again evidence that the decisions to preserve independence occur more frequently than at random (one-tail binomial test, \( p = 0.000 \) for each period). Furthermore, there is additional support for the proposition that independence is violated less often as the cost of a qualified report falls. The difference between the cost of a qualified report and an unqualified report falls from 2 francs in the first period to 0.75, \(-0.75\), and \(-2.5\) francs in periods 2, 3, and 4 respectively. Over these periods the proportion of reports which are qualified rise from 77% to 80%, to 90.9%, and to 98.6%.

When the probability of losing a client through disagreement is 40%, an amoral expected-profit maximizing independent auditor is expected to file unqualified reports in periods 1–3 and a qualified report in period 4 whenever a client makes a decision which is inconsistent with the auditor’s belief. Although the proportion of decisions which preserve independence rises from 48.8% in the third period to 71.4% in the fourth period, this latter value is well below 100% and the former is greater than zero. More generally, the prediction that no qualified reports will be filed during the first three periods is not supported.

Qualified reports are filed more frequently than random in the first period (one-tail binomial test, \( p = 0.043 \)) and no differently from random in periods 2 and 3 (one-tail binomial tests, \( p = 0.500 \) and \( p = 0.622 \) in periods 2 and 3 respectively).

When expected profit maximization would support issuing a qualified report, the proportion of unqualified reports is very high except when the probability of losing a client through disagreement is 40%. Most surprising is the lack of support for the expected profit maximization outcome when this implies issuing an unqualified report. In no case was the unqualified report issued less often than random allocation would imply.

6.4.4. Setting 2 to Setting 3 effects

H2 implies that the introduction of an uncertain external review (moving from Setting 2 to Setting 3) will lead to an increase in qualified reports in each of the four periods. When the probability of losing a client is 10% and the uncertain external review is introduced, the proportion of decisions preserving independence rises to nearly 100% in the first period and to 100% in each of the following three periods (see Table 4). This supports H2(\( \chi^2(1) \geq 8.424, p \leq 0.004 \) for the four periods). When the probabilities of losing a client are 25% and 40% and the uncertain external review is introduced, there is no significant change in the proportion of qualified reports (\( \chi^2(1) \leq 2.324, p \geq 0.127 \)) from Setting 2 in any period except for period 1 when the probability is 25% (\( \chi^2(1) = 11.589, p = 0.001 \)).

In summary, the strongest finding is the extent to which independence is preserved when self-interested expected-profit maximization would support compromising independence. The most troublesome result is the failure of the uncertain external intervention to generate significant increases in the proportion of decisions which preserve independence in the cases where there are 25%
and 40% probabilities of losing a client by filing a qualified report (although the
direction of the change is reflected in the data when the probability is 25%).

6.5. Moral development and preserving independence

The impact of moral development on decisions to preserve or compromise
independence is captured by introducing the DIT score of the subjects as an
independent variable in the probit regression equation. 17 The coefficients of
the DIT score in the probit regression reported in Table 5 is positive. This
means that the estimated probit left-hand-side variable (a \( z \)-statistic) increases
as the DIT score increases (the increase is 0.031 times the increase in the DIT
score). The larger the \( z \)-statistic the less likely it is that a subject will violate the
independence standard. The DIT coefficient in Table 5 is significantly different
from zero (one-tail \( t \)-test, \( p \leq 0.000 \)). This supports H3 which suggests there will
be a positive association between the DIT score and the frequency with which
independence is preserved.

The subjects who ultimately faced 10%, 25%, and 40% chance of losing a
client if they issued a qualified report participated in the same baseline envi-
ronment (Setting 1). The differences in the proportion of times in which in-
dependence was compromised by these subjects is tested using the data from
the regression analysis. These proportions are not statistically different from
one another (two-tail \( t \)-tests, pairwise comparisons, \( p = 0.938 \), \( p = 0.291 \), and
\( p = 0.258 \) respectively). 18 Thus, the data for Setting 1 were pooled across co-
horts and used as the Baseline average for Figs. 2–4.

Figs. 2–4 illustrate graphically the impact of the magnitude of the subjects’
DIT scores on their tendency to violate the independent standard. The figures
were calculated from the probit regression given DIT d-scores from 0 to 50.

One significant finding illustrated in Figs. 2–4 is the impact of the magnitude
of DIT d-scores on instances of violation in all settings, including the baseline
condition. The impact of the DIT score on the frequency of violating the in-
dependence standard increases at a decreasing rate. The tradeoff between self-
interested payoff maximization and adherence to a self-imposed standard be-
comes abundantly clear in Figs. 3 and 4. Even under the maximum potential
client loss condition (40%) subjects with higher DIT scores were less likely to
violate their beliefs than were those with lower scores.

17 The regression was run using the DIT d-score and using the DIT p-score. We argued earlier
that the d-score appeared to be the appropriate variable for this study. Each was statistically
significant and supported the conjecture that there was a negative relationship between a DIT score
and the frequency with which beliefs were violated. The maximized log of the likelihood function
using the d-score is larger than that using the p-score, supporting the selection of the d-score as the
more appropriate variable.

18 See Falk et al. (1996, pp. 28–29) for more details.
Looking at the difference in the frequency of violations of independence over the range of DIT scores, we can posit that on average, subjects with low d-scores violate independence more frequently than those with high d-scores. This result conforms to previous moral development research (Blasi, 1980, pp. 37–41; Rest, 1986, pp. 176–182; Ponemon and Gabhart, 1990, pp. 240–247; Windsor and Ashkanasy, 1995, pp. 715–717) but differs qualitatively because previous studies did not induce subjects to trade off between real financial gains and the violation of a self-identified standard.

7. Conclusions

Because auditor independence is normally not observable in practice we chose a controlled laboratory setting and devised an experiment that made the
Fig. 2. Probability of compromising independence given a subject’s DIT d-score when the probability of losing a client by disagreement is 10% as estimated from the probit regression reported in Table 5.

Fig. 3. Probability of compromising independence given a subject’s DIT d-score when the probability of losing a client by disagreement is 25% as estimated from the probit regression reported in Table 5.
exercise of independent audit judgement observable. Our study had three objectives:

1. to determine the impact of potential client loss on independent audit judgement,
2. to determine the impact of potential external review of the auditor and prescribed penalties on independent audit judgement, and
3. to determine the impact of the level of moral development of the individual on independent audit judgement.

We believe that the experiment and results reported here accomplish these objectives and allow us to draw conclusions which have policy implications for the public accounting profession. First we have shown through our manipulation of potential client loss settings that the larger the probability of client loss the more likely the independent auditor would be to agree with management and issue an unqualified report. The larger the economic impact of client loss, the more likely the independent auditors are to compromise their independent assessment of the situation. As we have seen, such behavior persisted even when there was a threat of external review of the audit decision and potential penalties to be paid. Increased scrutiny by peers and regulators and stiffer penalties for violations would only make sense in an economic environment where the disutility of the threat of punishment (the scrutiny and penalties) exceeds that of client loss.
For public accounting firms with a small client base, obviously the loss of a client has more significant consequences than for firms with a large client base. For large or small public accounting firms, the loss of a client that represents a significant proportion of total revenue, also poses a major economic threat. Our research results suggest that where such a threat of negative economic consequences is high, subjects appear to be less responsive to penalties for compromising independence. Future research may test the response of subjects to higher probabilities of losing a client by issuing a qualified report and to larger probabilities of an external review in order to confirm the result obtained in this session.

One conclusion that can be drawn from our results is that the level of moral development does seem to affect the exercise of independent judgement. Part of the theory of the stages of moral development as elaborated by Rest et al. (1986, pp. 1–27) is the concept that while individuals, on average, operate at a given stage of moral development (1–6), in certain situations they will use higher or lower levels of moral reasoning to solve moral dilemmas. The use of external intervention and penalties for infractions of the right judgement imposes a pre-conventional (Stages 1 and 2 of moral development) situation on the participants. Besides their innate moral stage (the DIT d-score), our research design adds an imposed external authority to which they must answer. Our results show that while the innate moral level consistently affects right judgement, the imposition of external authority only succeeds in doing so when the potential losses from the external threat exceeds the gains from violating independence. This result argues for increasing external auditors’ sensitivity to the ethical nature of their decisions. Since we did not reveal to our subjects the ethical connection we were going to make with their behavior in the experimental game, the effects that are found indicate a clear positive association between the moral development level of the subjects and their tendency to exercise independent judgement in their review of clients. Also, our subjects did not have a professional code of ethics to guide their behavior as professional independent auditors do. Our research suggests that heightening the focus on the moral development of auditors and increasing their awareness of the ethical nature of their actions may help to enhance their exercise of audit independence.

There are several factors about our research that somewhat limit the strength and applicability of our results. First, since the research took place in a laboratory-controlled environment using student subjects, it has strong internal validity but may not provide the external validity that using practicing independent auditors as subjects may afford. We tried to compensate for this by the research design, creating a series of experimental tasks and conditions that mimicked real world environments. Second, we did not explicitly consider reputation effects. While it is likely that this did not bias our results, future research could include reputation effects explicitly. Third, we have made no
explicit consideration of risk attitudes of the subjects. In the situations addressed by Hypothesis 1, there is no risk, while under Hypothesis 3, the predictions are independent of risk attitudes. Because we have concentrated on direction of change with Hypothesis 2, risk attitudes will not affect our results, although the magnitude of changes will be affected by risk attitudes. Finally, by not revealing the ethical dimension of the experiment, subjects may have emphasized their economic self-interest at the expense of their ethical propensities. It bears repeating, however, that subjects seemed to behave consistently with their level of moral development despite their ignorance of our objective. We can only speculate that had they known about the ethical dimension, e.g., had we included a code of ethics as part of the instructions, that our results would be even stronger than they are.

Auditor independence is a critical factor in sustaining the credibility of external auditors and their services. The present research has contributed to understanding both the economic tradeoffs and ethical implications of this important attribute of audit judgement. If independent auditors, in particular, and public accountants, in general, are to maintain the continued trust of the community, efforts to enhance ethical understanding and further research into the effects of increasing scrutiny and imposing penalties are vital.

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