

A Model and Literature Review of Professional Skepticism in Auditing

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INTRODUCTION AND SUMMARY

This paper reviews research that examines professional skepticism (hereafter, PS) in auditing. Consistent with much research and with recent regulatory concerns, the paper defines PS as “indicated by auditor judgments and decisions that reflect a heightened assessment of the risk that an assertion is incorrect, conditional on the information available to the auditor.” In many circumstances the assertion in question will be a client’s assertion that the financial statements are free of material misstatement, but the definition could apply to other assertions as well (e.g., attesting to the effectiveness of a client’s internal controls). This definition reflects more of a “presumptive doubt” than a “neutral” view of PS, implying that auditors who exhibit high PS are auditors who need relatively more persuasive evidence (in terms of quality and/or quantity) to be convinced that an assertion is correct. Depending on how an auditor’s decisions are evaluated, it is possible under this definition for an auditor to exhibit too much PS, in that they could design overly inefficient and expensive audits.

The paper provides a model that describes how audit evidence combines with auditor knowledge, traits, and incentives to produce judgments that reflect PS. The model also describes how, given a judgment that reflects some level of PS, the judgment combines with auditor knowledge, traits, and incentives to produce actions that reflect relatively more or less PS. The model highlights that auditors’ pre-existing knowledge, traits, and incentives all combine (and potentially trade off or interact) to affect the amount of PS in audit judgment and audit actions. This perspective also facilitates understanding how audit firms can influence PS in practice via hiring, training, performance appraisal, review, decision aids, incentives, and changes in tasks and institutions. For example, prior research suggests the following about particular elements of the model:

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- **Knowledge:** Audit experience and specialization have both positive and negative effects on PS. High-knowledge auditors are better able to identify high-frequency errors and complex patterns of evidence that indicate error, but also are more likely to assume that non-error explanations are correct and that missing evidence is consistent with non-error explanations. Knowledge of complex professional standards also provides auditors with an advantage when interacting with clients about contentious accounting issues.
- **Traits:** Problem-solving ability, ethical predisposition, and other traits like self-confidence and tendency to doubt are all related to PS in judgment and action. Recent improvements in psychological measurement offer the potential for understanding better how traits combine and interact with knowledge and incentives to produce judgments and actions that reflect PS, and also offer some potential for screening for PS.
- **Incentives:** PS-relevant incentives differ in the extent to which they affect an individual directly or indirectly, are immediate versus probabilistic, and are financial versus social in nature. Incentives can affect the extent of PS in judgment in conscious and unconscious ways. Incentives also can affect the extent to which judgments that reflect PS produce actions that reflect PS.
- **Judgment:** Cognitive limitations affect PS in predictable ways. Some of these cognitive limitations may offer opportunities to increase PS, e.g., by reframing hypotheses so that confirmation biases favor PS, by writing implementation guidance so that biased similarity comparisons favor PS, or by ordering information such that any recency biases favor PS.
- **Action:** Auditors' actions influence audit quality, and form the basis on which the auditor is later judged. Key actions examined by prior research include audit planning and dealing with proposed audit adjustments. Because prior research has tended to focus on only a subset of the relationships between knowledge, traits, incentives, judgment, and action, it has not comprehensively considered the extent to which these factors can offset or interact to affect the extent to which actions reflect PS.

The rest of the paper proceeds as follows. The first section discusses the various definitions of PS in professional standards and academic research, and specifies the definition of PS used in this paper. The second section introduces the model and relates it to prior PS-related models in auditing. The third, fourth, and fifth sections discuss research relevant to understanding how knowledge, traits, and incentives combine to affect PS in judgment, respectively. The sixth section discusses PS-relevant research concerning the judgment process itself, and the seventh section relates all of those elements to audit actions that reflect PS. The eighth section discusses ways in which the model and related research suggests audit practice can encourage PS, including via hiring, training, performance evaluation, review and consultation, decision aids, changes in incentives, and changes in tasks and institutions. The last section concludes with suggestions for future research.

DEFINING PROFESSIONAL SKEPTICISM

Professional Skepticism as Defined in Professional Standards and Practice

Professional skepticism is a concept that is discussed frequently in professional standards, but with little precision. One perspective, introduced in SAS No. 1, is what the Panel on Audit Effectiveness characterizes as the “neutral” view of skepticism (O’Malley 2000, 76). For example, SAS No. 1 indicates that PS is a requirement of due professional care,

and that PS is “an attitude that includes a questioning mind and a critical assessment of audit evidence. The auditor uses the knowledge, skill, and ability called for by the profession of public accounting to diligently perform, in good faith and with integrity, the gathering and objective evaluation of evidence ... The auditor neither assumes that management is dishonest nor assumes unquestioned honesty” (AU 230.07–09). In other words, the auditor works hard to gather and evaluate evidence, but does not assume any bias *ex ante*. Similar wording appears in international auditing standards (IAASB 2004, ISA 200.15–16). The PCAOB invokes this definition in AS No. 2 (PCAOB 2004, para. 36), and other U.S. standards invoke this definition of PS while referencing the definition provided in AU 230. For example, regarding confirmations, SAS No. 67 indicates that “the auditor should exercise an appropriate level of professional skepticism throughout the confirmation process. Professional skepticism is important in designing the confirmation request, performing the confirmation procedures, and evaluating the results of the confirmation procedures” (AU 330.15). More generally, SAS No. 109 highlights that “the auditor should plan and perform the audit with an attitude of professional skepticism” (SAS No. 109.19).

A somewhat differently nuanced perspective is provided by standards that focus on fraud or areas in which management appears to have much discretion. These standards still reference the “neutral” view of PS established in AU 230, but put a somewhat different spin on it. As noted by Bell et al. (2005), they appear to suggest more of a forensic-auditing mindset in which auditors have “presumptive doubt” and assume some level of dishonesty unless data indicate otherwise. For example, regarding accounting estimates, SAS No. 57 indicates that “as estimates are based on subjective as well as objective factors, it may be difficult for management to establish controls over them ... There is a potential for bias in the subjective factors. Accordingly ... the auditor should consider, with an attitude of professional skepticism, both the subjective and objective factors” (AU 342.04). SAS No. 99 indicates that “because of the characteristics of fraud, the auditor’s exercise of professional skepticism is important when considering the risk of material misstatement due to fraud ... The auditor should conduct the engagement with a mindset that recognizes the possibility that a material misstatement due to fraud could be present, regardless of any past experience with the entity and regardless of the auditor’s belief about management’s honesty and integrity. Furthermore, professional skepticism requires an ongoing questioning of whether the information and evidence obtained suggests that a material misstatement due to fraud has occurred” (AU 316.13). Again, similar wording appears in international standards (ISA 240.24), and the PCAOB invokes this definition in AS No. 2 (PCAOB 2004, para. 16). Auditors are required to presume that there is a risk of fraud in revenue (AU 316.41), and should consider responding to risk of fraud (AU 316.50) or other material misstatement (SAS No. 110.4) by increasing the unpredictability of audit procedures.

Bell et al. (2005) suggest that we may see a shift from a “neutral” to a “presumptive doubt” perspective on PS, which in turn will increase the minimum levels of evidence necessary to justify audit opinions. As a practical matter, auditors should note that regulators appear to take more of the “presumptive doubt” perspective, as they typically refer to PS as something that was missing when an audit failure has occurred. For example, former SEC Chief Accountant George Diacont identified lack of PS as a primary cause of audit failure (Carmichael and Craig 1996). Lack of PS has been identified as contributing to the majority of the SEC enforcement actions (Beasley et al. 2001), and is a primary contributor to malpractice claims against auditors (Anderson and Wolfe 2002). While one could imagine applying the neutral perspective of PS to criticize an auditor for accumulating too much

evidence or by paying too much attention to evidence that is suggestive of misstatement, that is not primarily how the term has been applied when criticizing auditors.¹

Professional Skepticism Defined in the Academic Literature

The academic literature likewise has been somewhat inconsistent in defining PS. Some studies take a neutral perspective. For example, Hurtt (2007) defines PS in terms of various characteristics of skeptics (e.g., a questioning mind, suspension of judgment, self-confidence) that focus more on having and pursuing doubt than on a particular direction of doubt. Bamber et al. (1997) consider how auditors update their beliefs in light of new evidence, and their framework accommodates a neutral weighting. Cushing (2003) defines skeptics as tending to be relatively accurate in their risk assessments, as opposed to “trusting” or “suspicious” auditors who are predictably biased.

However, other academic literature appears to take more of the presumptive-doubt perspective, viewing auditors as exhibiting more PS when they consider it more likely that the financial statements are materially misstated or when they accumulate more evidence in order to conclude material misstatement is not present. For example, Shaub (1996) equates skepticism with suspicion (and as the opposite of trust). Hogarth and Einhorn (1992, 40) define a skeptic as being someone who is “highly sensitive to negative evidence but ignores positive evidence,” and McMillan and White (1993) view an auditor as skeptical if the auditor is more sensitive to evidence that reduces the risk of failing to detect errors in the client’s financial statements. Bamber et al.’s (1997) framework also accommodates such a non-neutral weighting. Various experimental papers state that they are increasing PS with manipulations that emphasize the need to gather further evidence before accepting client-provided explanations (e.g., Peecher 1996; Turner 2001). Finally, some research studies characterize PS from an outcome perspective that appears to view skeptical outcomes as indicating that more presumptive doubt was exercised, e.g., with better ability to detect fraud viewed as indicating more PS (e.g., Carcello and Neal 2000; Choo and Tan 2000).

Definition Used in This Paper

I adopt a “presumptive doubt” perspective of PS in this paper. I view a skeptic as one whose behavior indicates relatively more doubt about the validity of some assertion. More specifically, I define PS as indicated by auditor judgments and decisions that reflect a heightened assessment of the risk that an assertion is incorrect, conditional on the information available to the auditor. Under this definition, an auditor who has high PS needs relatively more convincing (in the form of a more persuasive set of evidence) before concluding that an assertion is correct. I view auditing as primarily testing the assertions that the client’s financial statements are free of material misstatement and that the client’s control system is operating effectively, but my definition could apply to other assertions as well.

Note that adopting this presumptive doubt view of PS essentially amounts to emphasizing an asymmetric versus a symmetric doubt on the part of auditors. Under this view, high-PS auditors are more likely to doubt evidence that an assertion is true than they are to doubt evidence that an assertion is false, and will tend to collect relatively more evidence as a result. Thus, under this definition, high PS may not result in an audit that has an optimal balance of effectiveness and efficiency. Rather, it is possible for an auditor to be too skeptical, and an audit that displays extremely high PS may be inefficient and may produce excessive client ill will. Identifying optimal levels of PS is not a focus of this

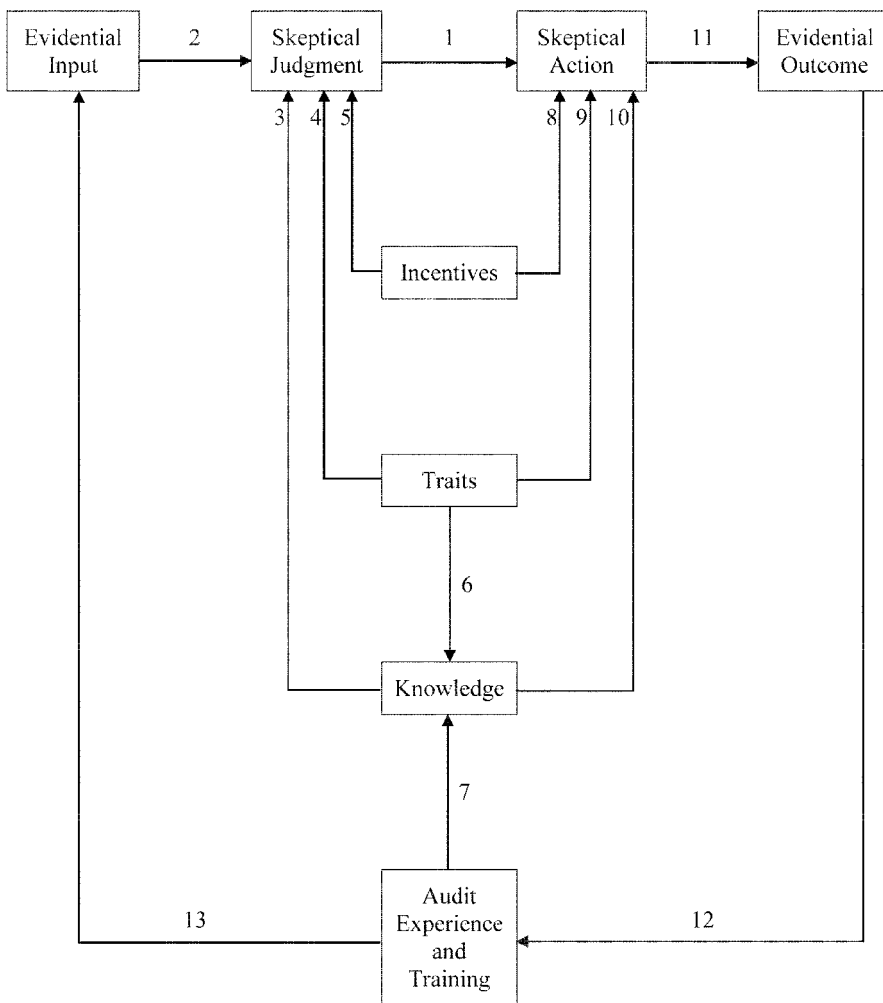
¹ The auditing profession has been criticized recently for perceived over-auditing of internal controls in response to the PCAOB’s AS No. 2. However, I have not seen this criticism couched in terms of excessive PS.

paper. Rather, this paper integrates and discusses research that sheds light on the determinants of PS.

MODELING PROFESSIONAL SKEPTICISM

In this section, I provide an overview of a simple model of PS, shown in Figure 1, that integrates prior work by several authors. At the center of the model is the idea that there is a difference between skeptical judgment and skeptical action (link 1). As indicated in the definition of PS provided in the auditing standards (AU 230), PS is a product of auditors’ judgment, but PS is revealed by skeptical behavior, and therefore is an attribute of auditor performance.

FIGURE 1
Model of Determinants of Professional Skepticism in Audit Performance



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Evidential input provides an important input to the judgment process (link 2). I view audit evidence broadly as including any information collected and considered in the course of the audit. PS can affect initial audit planning, when the initial evidential input may consist of only background information about the client, and can also affect choice of audit opinion, when the evidential input consists of all evidence accumulated as part of the audit process.

Other inputs to the judgment process include the auditor's knowledge (link 3), other non-knowledge attributes that I refer to collectively as auditor traits (e.g., intelligence, tendency to doubt, self-confidence; link 4), and auditor incentives (link 5). I follow Libby and Luft (1993) in viewing auditor knowledge as resulting from a combination of traits (link 6) and prior experience (which includes training; link 7), and in viewing traits as fixed by the time an auditor commences audit training and practice.

Prior research in psychology and accounting has identified that auditors' judgments are vulnerable to various problems, such as difficulty recognizing patterns of evidence, applying prior knowledge to the current judgment task, weighting evidence appropriately, and preventing incentives from affecting judgment in unconscious ways. All of those difficulties could affect the extent to which judgments reflect PS.

Whether PS judgments translate into PS actions depends not only on the extent to which judgments reflect PS, but also on aspects of the auditor's incentives (link 8), traits (link 9), and knowledge (link 10). This distinction between judgment and action reflects the idea that PS must reach some threshold before it is sufficient to promote action, and that whether an auditor actually appears to have exercised PS is also influenced by aspects of knowledge (e.g., knowledge of constraints provided by accounting and auditing standards), traits (e.g., self-confidence), and incentives (e.g., whether pressures to stay within time-budget or avoid displeasing the client discourage the auditor from taking particular actions, holding constant the PS reflected in their judgment).

Skeptical action can change the amount or nature of evidence available to the auditor, which must then be reconsidered by the auditor and which becomes part of the auditors' experience and knowledge. Therefore, this model is recursive, with evidence being assimilated and judged, action taken, further evidence resulting from action taken (link 11), that evidence becoming part of the auditor's experience (link 12), and that evidence becoming future input (link 13) to the process.

The model integrates various perspectives in prior accounting and psychology research. Hurtt (2007), drawing on professional standards and the philosophy literature, focuses on the relation between traits of skeptical people and various skeptical behaviors. Shaub (1996) and Shaub and Lawrence (1996), drawing on prior work in psychology by Kee and Knox (1970), model auditor traits as combining with context and prior experience to produce some subjective level of trust or suspicion, which may translate into skeptical behavior. Trevino (1986) models ethical decision making as depending on interactions between personal characteristics and situational factors like incentives. Bamber and Iyer (2007), drawing on social identity work in social psychology, model incentive factors and traits like identification with client versus profession as affecting both judged skepticism and auditor actions. Johnstone et al. (2001) describe various incentives, counter-incentives and mitigating factors (including auditor traits) as determining the independence (and thus, by my definition, PS) of audit judgment and action. Libby and Luft (1993) model judgment performance (e.g., judgment skepticism) as depending on knowledge and traits, and auditor knowledge as depending on traits and experience.

In the next sections, I discuss evidence concerning the effects of auditor knowledge, traits, and incentives on both skeptical judgment and (separate from their effect on judgment) skeptical action.

KNOWLEDGE (LINK 3)

For auditors to be able to exercise PS in response to a given set of evidence, they must understand the directional implications of evidence for audit risk, and also must be able to apply their knowledge of evidential patterns and error/non-error frequencies to determine whether a given set of evidence suggests heightened risk.

Knowledge of Directional Relations between Evidence and Audit Risks

Given some evidential input, one critical knowledge element is the directional relation between an item of evidence and the risk that the financial statements are misstated. Many studies have examined auditor risk assessments (for a review see Allen et al. 2006), and some recent studies have examined risk analysis in the context of “strategic systems” audit approaches (Bell et al. 1997; Eilifsen et al. 2001; Bell et al. 2005) that place more emphasis on an organization’s business strategy when assessing risks and developing expectations (e.g., Ballou et al. 2004; Choy and King 2005; O’Donnell and Schultz 2005). In general, risk-assessment studies provide evidence that auditors possess knowledge that enables them to modify assessed risk in response to client characteristics such as management integrity, competence and turnover, firm characteristics such as financial health and internal control quality, and to evidence quality, though as discussed in the sixth section some studies indicate that auditors in particular circumstances might adjust their risk assessments too little or too much.

A few studies explicitly elicit auditors’ response to risk factors in terms of adjustments to PS. For example, Shelton et al. (2001) indicate that four of five Big 5 firms and two of two next-tier firms include as part of their risk-assessment process specific guidance for auditors to respond to evidence of fraud-risk factors by adjusting their PS. These responses encourage compliance with fraud-related standards that indicate auditors should move to a more presumptive-doubt, forensic mindset in response to heightened fraud risk. Shaub and Lawrence (1996) provide evidence that auditors are more likely to be skeptical when various risk factors are present (related party transaction, client financial stress, prior client inaccuracies, poor auditor-client communications).

Frequency Knowledge, Pattern Recognition, and Specialization

PS also is facilitated if auditors’ experiences have given them knowledge of the frequencies of errors and non-errors and the patterns of evidence that suggest a heightened risk of misstatement.

Much prior research has examined knowledge of error frequencies and the use of that knowledge in various settings, particularly analytical review (see Nelson [1994] for a review). In general, prior studies provide evidence that experienced auditors possess relatively accurate knowledge of more common error causes and error effects (Libby 1985; Ashton 1991), and that knowledge of at least error causes increases with experience (Libby and Frederick 1990). Other research suggests that auditors structure their memories around important dimensions like error causes (Tubbs 1992; Frederick et al. 1994; Nelson et al. 1995), which makes frequency information relevant to those dimensions more available (Bonner et al. 1997). Better frequency knowledge is associated with a tendency by auditors who are faced with unexplained audit findings to generate high-quality hypotheses and evaluate those hypotheses more accurately (Libby 1985; Libby and Frederick 1990).

Other research examines the effects of industry specialization and other audit experience, which may influence frequency knowledge but also provide other knowledge (Bonner and Lewis 1990). Studies demonstrate that specialists and auditors with other domain-specific experience are more likely to identify the potential for specialty-specific errors (Wright and Wright 1997; Owosho et al. 2002; Low 2004) and modify their audit planning decisions as a result (Bedard and Wright 1994; Low 2004). In general, experienced auditors are more likely to have more detailed and abstract problem representations (Christ 1993), are better able to disregard irrelevant information (Shelton 1999), and are more likely to recognize combinations of evidence that suggest a heightened risk of error (Brown and Solomon 1990, 1991; Bedard and Biggs 1991a; Maletta and Kida 1993). Industry specialists are particularly well able to identify patterns of evidence that indicate a particular misstatement (Bedard and Biggs 1991b; Johnson et al. 1991), recognizing and filling in incomplete patterns and suggesting effective and efficient procedures that are designed to determine if a potential misstatement is present (Hammersley 2006). For example, experienced auditors increase planned audit hours when they perceive the combination of a client having an explicit incentive to misstate *and* there being minimal corroborating evidence supporting the client's non-error explanation (Glover et al. 2000), illustrating an effect of knowledge on judgment and then on action.²

However, prior research also suggests that knowledge might not always enhance PS. More experienced auditors are more likely to believe that non-errors are relatively more likely explanations for audit findings (Kaplan et al. 1992), potentially compromising PS (Koonce 1992a). Industry specialists also tend to identify non-errors as more likely explanations for audit findings (Solomon et al. 1999), and in some tasks specialists assess lower inherent risk than non-specialists (Taylor 2000). More experienced auditors' greater expectation that non-errors explain audit findings could explain evidence that staff auditors are more skeptical in their judgments and behaviors than more experienced auditors (e.g., Shaub and Lawrence 1999). Particularly in a case where a misstatement is intentional, patterns of evidence may appear to suggest a non-error explanation, and auditors who understand those patterns may tend to follow that expectation rather than looking for critical missing information. Prior research provides evidence of such "gap filling" (Moeckel and Plumlee 1989; Moeckel 1990; Choo and Trotman 1991), and that auditors may tend to not dig further when their expectations of no problems are supported by initial evidence (Earley 2002).

Thus, auditor knowledge of errors and error patterns can serve to enhance PS. However, if auditors learn over time to assume non-error explanations and not pursue critical missing information, greater frequency knowledge can actually undermine PS (again, with PS defined from a presumptive-doubt perspective).

TRAITS (LINK 4)

Traits are non-knowledge attributes of the auditor that can affect the auditor's PS. I divide PS-related trait research into three categories: problem-solving ability, ethics/moral reasoning, and skepticism scales.

Problem-Solving Ability

One PS-related trait identified in prior research is problem-solving ability. The basic idea here is that raw intelligence will help auditors identify potential misstatements. Bonner

² Studies have shown that auditors are likely to recognize ethical issues covered by the Code of Ethics (see, e.g., Claypool et al. 1990; Dreike and Moeckel 1995; Douglas et al. 2001), but it is difficult to know whether that is because auditors access their knowledge of the Code or because issues covered by the Code are more easily identified in general.

and Lewis (1990), Bonner et al. (1992), Bonner and Walker (1994), and Libby and Tan (1994) all assess problem-solving ability via responses to GRE questions, and Bierstaker and Wright (2001) assess problem-solving ability using a scale that is based on responses to scenarios. In general, these studies find significant relations between ability and performance of PS-relevant audit tasks (identifying errors via ratio analysis, earnings-manipulation detection), particularly when those tasks are unstructured (Bierstaker and Wright 2001), but do not address whether greater problem-solving ability tends to encourage more PS.³

Ethics or Moral Reasoning

Another trait investigated by many prior studies is ethical development, or “moral reasoning” (for a review see Jones et al. 2003). One way to view this trait is that it identifies the extent to which auditors’ PS-related judgments and actions are affected by their incentives. Most of these studies are based on Kohlberg’s (1969) “theory of cognitive development.” Kohlberg identified three levels of ethical reasoning: “preconventional,” where ethical judgments are based on consequences, “conventional,” where ethical judgments are based on expectations of others and are dictated by rules and laws, and “postconventional,” where ethical judgments are based on overriding ethical principles.⁴ These sorts of papers tend to assess auditors’ moral reasoning using assessment instruments like Rest’s (1986) Defining Issues Test to develop scales like the “P score” that identify the stage of ethical development that people have reached, and correlate that score with ethical judgments and/or behaviors (analogous to PS judgments and actions).

The general result of these studies is that auditors at higher stages of moral development appear more sensitive to information about client competence and integrity (Ponemon 1993; Ponemon and Gabhart 1993), are better able to identify potential inappropriate behavior (Bernardi 1994) and are less likely to engage in inappropriate behavior (Ponemon and Gabhart 1993). For example, auditors with higher DIT scores appear less likely to under-report time (Ponemon 1992b) and compromise assessments (Falk et al. 1999). However, evidence relating DIT scores to auditor decisions is somewhat mixed (Shaub and Lawrence 1996; Lord and DeZoort 2001). Auditors often display lower levels of DIT P scores than other similarly educated groups, appearing more conventional than post-conventional, but that could be due to political bias of the DIT and to auditors tending to be rules-oriented (Jones et al. 2003). Auditors’ moral reasoning scores increase when assessed using a more auditing-specific instrument (Massey 2002). Also, early studies identify an inverse relation between auditor experience and moral development as measured by P scores (e.g., Ponemon 1988; 1992a), but later work provides evidence that these results are an artifact of research design, and that instead auditors’ moral development increases with time and that firms tend to retain auditors with higher levels of moral development (Bernardi and Arnold 2004).

³ A related set of studies addresses auditors’ ability to recognize complex patterns of evidence. Pincus (1990) provides evidence that auditors are better able to identify a seeded fraud if the auditors are more field-independent (able to break up complex field and structure and organize elements, which is helpful when facing misleading contexts; measured with the “group embedded figures” test) and ambiguity-intolerant (tending to view ambiguity as a source of threat, measured with the AT-20 test). However, Bernardi (1994) found no effect for field independence in a similar experiment.

⁴ Interestingly, higher moral development according to Kohlberg may not be preferable in auditing, as post-conventional auditors might deviate from rules under some circumstances and be less vulnerable to influence by threat of sanction or other disincentives. Ponemon (1993) and Schatzberg et al. (2005) suggest circumstances where higher moral reasoning results in more departure from auditing conventions and cooperation for mutual benefit, which could lead to some forms of independence violations.

Skepticism Scales

Other research attempts to rate PS more directly and relate those ratings to audit judgments and actions. Results are somewhat inconsistent. For example, Shaub (1996) assesses general propensity to be skeptical using two scales developed by Wrightsman (1974) that assess belief that people are trustworthy (moral and responsible) and independent (resisting group pressures and follow their own beliefs), as well as a client trust scale that assesses the general tendency for auditors to trust their clients. Shaub (1996) finds no significant relation between scores on the trustworthiness and independence scales and auditors' skeptical judgments or actions, and intermittent significance of the client-trust measure. Rennie et al. (2007) find no relation between Shaub's (1996) client trust measure and auditors' recalled trust of a client they disagreed with, and also find no relation between auditors' recalled trust and auditors' general predisposition to trust people (using a scale adapted from McKnight et al. 2002).

More recently, Hurtt (2007) has developed and tested an auditing-focused PS scale. She bases the scale on six separate characteristics of skeptics that are distinct from knowledge and ethics. She supports those characteristics from the philosophy literature and auditing standards, as follows:

- Suspension of judgment: Philosophers view skeptics as unwilling to simply accept assertions and claims, and instead as keeping an open mind and critically evaluating evidence (e.g., Hallie 1985; Kurtz 1992). In the auditing standards, SAS No. 1 indicates the importance of suspending judgment until sufficient evidence is collected.
- Questioning mind: The philosophy literature includes probing, proving assertions, active questioning, and inquisitiveness among the characteristics of skeptics (Stough 1969; McGinn 1988; Bunge 1991; Kurtz 1992; Fogelin 1994). In the auditing standards, SAS Nos. 82 and 99 include a questioning mind in their definitions of PS.
- Search for knowledge: Philosophers view a more general search for knowledge as an important characteristic of skeptics (Naess 1969; Johnson 1978; Bunge 1991; Popkin and Stroll 2002). In the auditing literature, Mautz and Sharaf (1961) identify the importance of general curiosity.
- Interpersonal understanding: Much philosophy literature indicates that understanding motivation is key to understanding the potential for bias or differences in perception (Johnson 1978; Popkin 1979; Burnyeat 1983; McGinn 1989; Kurtz 1992). In the auditing standards, SAS Nos. 57, 82, and 99 note that the auditor needs to consider whether client-provided evidence lacks credibility. Additional "fraud triangle" research (Wilks and Zimbelman 2004) highlights the importance of auditors considering client incentives and attitudes as well as opportunities.
- Self-confidence: Philosophers recognized the need for skeptics to challenge others and value their own insights (Linn, de Benedictis and Delucchi 1982). In the auditing literature, Mautz and Sharaf (1961) identify the need for auditors to have professional courage. Marketing research shows that skepticism about advertising claims is positively associated with self-esteem (Boush et al. 1994).
- Self-determination: Philosophers view skeptics as withholding conclusion until they are satisfied that they have enough evidence and are personally convinced (Bunge 1991). In the auditing standards, SAS No. 1 requires that auditors acquire sufficient evidential matter.

When viewed collectively, these characteristics capture the idea that skeptics keep an open mind and question possible conclusions, searching for evidence, considering the potential that the evidence is biased, and aggressively questioning until they personally arrive at a conclusion. I view them as consistent with both the “neutral” and “presumptive doubt” perspectives of PS.

Hurtt (2007) describes a systematic approach to assessing these characteristics by using a 30-question instrument, and uses factor analysis to demonstrate the uniqueness of each characteristic. The overall “Hurtt score” does not correlate with Wrightsman’s Trustworthiness or Independence scales, which Shaub (1996) uses unsuccessfully to try to measure PS. The Hurtt score is relatively stable over time, but there is some tendency for the score to decrease on a second administration of the instrument, and for individual components of the score to change significantly (Carpenter 2004; Hurtt 2007).

Two other studies provide evidence that the Hurtt score can predict skeptical behavior. Fullerton and Durtschi (2005) examine fraud detection by internal auditors. They find that internal auditors are more likely to expand information search when they have a higher Hurtt score (hi/lo median split). Hurtt et al. (2008) test whether auditors’ Hurtt score is associated with skepticism-consistent behaviors (expanded info search, increased contradiction detection, increased generation of alternative hypotheses and increased scrutiny of interpersonal info) in an online audit work-paper review task. They provide evidence that the Hurtt score is significantly associated with number of information search queries and number of contradictions detected when auditors face high-risk clients, but less so when they face low-risk clients.

INCENTIVES (LINK 5)

Numerous countervailing incentives that are relevant to PS have been identified in prior research. At the firm level, incentives favoring PS are provided by the potential for regulatory enforcement by the PCAOB, SEC and other regulatory bodies, litigation, and consequent reputation loss that reduces an audit firm’s ability to attract clients and maintain higher fees for audit services. As indicated by the recent demise of Arthur Andersen and Laventhol & Horwath, the effects of these factors can accumulate to threaten the existence of the firm. These factors affect the incentives of individual auditors via individual liability, threat to individual reputation (via censure), and potential loss of partnership capital and retirement payouts. Also, their importance to the audit firm encourages the firm to take actions that modify the incentives of individual auditors via performance appraisals that affect compensation, advancement, and the potential for loss of position, such that firm-level incentives that lack directness and immediacy for individual auditors have indirect effects on incentives that have direct, immediate effects (Nelson 2006). Auditors also face non-pecuniary incentives favoring audit quality provided by their professional identity and their role in audit firm cultures, and they serve on audit teams that can insulate them somewhat from client pressure (King 2002; Nelson 2004).

Offsetting incentives to reduce PS also exist. Clients and competition place heavy pressure on auditors to keep audit costs low, which could discourage expenditure of audit effort. Loss of fees can affect auditor advancement and compensation, and disagreements with clients can jeopardize client relationships and result in loss of fees. These concerns may be heightened if the audit firm “low-balled” initial audit fees to attract clients, as the auditor is potentially more concerned about preserving a long-term relationship. Also, since many auditors eventually leave public accounting to join the financial management of their former

clients, they may be reluctant to damage relations with management. Non-pecuniary incentives to reduce PS also exist in the form of social pressures from clients that the auditor does not want to disappoint (Bazerman et al. 2006).

Given the existence of these many powerful but conflicting incentives, it is perhaps not surprising that auditing theoreticians have tended to view auditors as being influenced by the balance of incentives that they face in a particular context (see, e.g., Goldman and Barlev 1974; Nichols and Price 1976; DeAngelo 1981; Antle 1982, 1984; Fellingham and Newman 1985; Magee and Tseng 1990; Antle and Nalebuff 1991; Teoh 1992; Bloomfield 1995; Johnstone et al. 2001). Various different approaches have been used to gather data about these issues.

Archival studies have primarily focused on nonaudit fees as a potential incentive for auditors to compromise audit quality. These studies typically examine the relation between nonaudit fees and abnormal levels of discretionary accruals. Results of this research have been somewhat mixed (e.g., for research indicating that nonaudit fees reduce PS, see Frankel et al. 2002; Larcker and Richardson 2004 for the 20 percent of their sample of firms that have weak elements of corporate governance, and Srinidhi and Gul 2006; for research indicating that nonaudit fees do not reduce PS see Antle et al. 2006; Chung and Kallapur 2003; Ashbaugh et al. 2003; Ruddock et al. 2006). Other archival studies provide little or no support that amount of nonaudit services is related to tendency for clients to restate their financials (Kinney et al. 2004) or receive going concern opinions (DeFond et al. 2002).

Experimental research has also addressed these issues, varying incentive factors while holding all else constant. For example, Beeler and Hunton (2002) provide evidence that audit partners' evaluation of evidence and going-concern judgments are affected by whether the client offered significant future opportunities for nonaudit fees and whether the audit firm "low balled" the audit fee (i.e., accepted a low fee in the initial year of the engagement in order to attract the client, making it more important to retain the client in future years). Gramling (1999) provides evidence that auditors rely more on internal auditors when clients emphasize low fees than when clients emphasize high quality. Numerous other studies provide additional evidence that auditors' incentives affect judgments about appropriate accounting treatment and/or appropriate audit opinion. Particular incentives examined include need to maintain office profitability (e.g., Trompeter 1994), client fee pressure (e.g., Gramling 1999; Houston 1999), client preference (Haynes et al. 1998), fear of client loss (Farmer et al. 1987; Blay 2005), and potential litigation exposure (e.g., Farmer et al. 1987; Hackenbrack and Nelson 1996; Braun 2001; Blay 2005).

Other studies examine constructs that are similar to incentives. For example, Bamber and Iyer (2007) provide evidence that extent of "client identification" (which I view as similar to judgment that is low on PS) is increased by the length of auditor tenure with the client, the importance of the client to the auditor, and the prestige of the client. Shafer and colleagues (Ketchand et al. 1999; Shafer et al. 1999, 2001) discuss the concept of "ethical intensity," which I view as equivalent to the probability that the auditor will suffer harm, as it is operationalized via materiality of misstatement, intended use of financial statements, risk of litigation, peer review, etc. They find that auditors are less likely to accede to client pressure in situations of high ethical intensity.

A related literature examines auditor's tendency to remain committed to a previous decision. Prior research suggests that auditors remain committed to a previous loan-reserve-evaluation decision (Jeffrey 1992), focus on facts consistent with their previous judgments (Tan 1995), and maintain consistency with a prior decision (Brody and Kaplan 1996). An ability to waive adjustment of misstatements that appear immaterial may leave auditors

vulnerable to a gradual snowballing effect (Wright and Wright 1997; Braun 2001; Nelson et al. 2002), particularly when materiality is estimated in a manner that focuses only on the layer of misstatement added in the current year (Nelson et al. 2005) (the recently issued SAB No. 108 should reduce the prevalence of this sort of waived misstatement). Even concurring partners are vulnerable to these effects, with concurring partners who are asked to assume they also had that role in the prior year less likely to require a goodwill impairment writedown than partners asked to assume this was their first year as concurring partner (Favere-Marchesi and Emby 2005). These effects could be driven by auditors' concerns over the potential for negative outcomes should they reverse a previous decision and appear to have admitted a mistake or broken an agreement with their client. However, many of these effects could also be driven by auditors' assumption that their prior decision to waive misstatement was correct.

In general, incentive studies provide evidence that auditors are more likely to make judgments that exhibit more PS (i.e., are less willing to allow aggressive reporting) as the balance of incentives tips toward concerns about exposure to litigation and reputation loss and away from concerns about client importance and the potential for client loss. Some studies also provide evidence of more complex relationships among incentive factors, e.g., that concerns over client retention might sway auditor judgment more when litigation risk is low (Chang and Hwang [2003], but also see Asare et al. [2005] for evidence of independent effects of litigation risk and potential for nonaudit services).

JUDGMENT PROCESS

Figure 1 depicts evidential input, pre-existing knowledge, traits and incentives all affecting audit judgment. As an example of an audit judgment critical to PS, much prior audit research has examined risk assessment overall and as applied in the audit risk model (for a review, see Allen et al. [2006]). This section describes research that examines audit judgment processes.

Many studies draw upon foundational work in psychology (e.g., Tversky and Kahneman 1974) to identify how cognitive limitations affect audit judgment. Many of these limitations could serve to reduce PS. For example, differential availability of memories can affect assessed likelihood of errors and nonerrors (Libby 1985), so judgments of the likelihood of various errors and nonerror hypotheses can be influenced by the number of alternative hypotheses that are provided (Heiman 1990) and by instructions to provide explanation or counter-explanation (Koonce 1992b). Auditors may not spontaneously consider the sufficiency of explanations (Anderson and Koonce 1998), particularly when they do not quantify effects of insufficient explanations (Anderson and Koonce 1995), and may fail to generate additional hypotheses when they receive evidence that counters their initial hypothesis (Asare and Wright 2003). They may not recognize interdependencies among hypothesis tests, and so overaudit (Asare and Wright 1997), but also may stop generating hypotheses too early, and so underaudit (Bierstaker et al. 1999). Although comparison of evidential outcomes to expectations is often a critical audit step, auditors may fail to form expectations or base expectations on client-provided evidence like book values (Kinney and Uecker 1982; Biggs and Wild 1985; Wild and Biggs 1990), view evidence that is in line with expectations as more persuasive than evidence that is not (Glover et al. 2005), and fail to dig deeper when initial information is in line with expectations (Earley 2002) or when indications of aggressive reporting are received late in the process (Phillips 1999). Audit judgments can also be affected by irrelevant information (Hackenbrack 1992; Glover 1997; Hoffman and Patton 1997; Shelton 1999), with irrelevant information diminishing the extent to which auditors attend to fraud cues.

Particularly relevant to PS is research that focuses on belief updating. A useful perspective is provided by Hogarth and Einhorn (1992), who model revision of belief in a hypothesis (e.g., “the financial statements are misstated”) in light of new evidence as depending on prior belief (an “anchor”), a subjective evaluation of the strength of the new evidence, and some weight that is placed on the evidence. Various researchers have used this perspective to examine auditors’ belief revision (see, e.g., Ashton and Ashton 1988, 1990; Butt and Campbell 1989; Tubbs et al. 1990; Knechel and Messier 1990; Asare 1992; Pei et al. 1992; Krull et al. 1993; McMillan and White 1993; Bamber et al. 1997). In general, this literature indicates an effect of the order in which evidence is received, with evidence that is contrasting and recent weighted more strongly.

However, Bamber et al. (1997) note that the literature also has produced some conflicting findings concerning evidence weighting and PS. They provide a framework that characterizes auditor weighting of evidence according to the initial hypothesis (financial statements misstated versus not misstated) and the implication of the evidence (supporting misstatement, supporting lack of misstatement). This framework accommodates both the “neutral” and “presumptive doubt” views of PS, with neutrality indicated by the auditor using a similar weight for all evidence, and presumptive doubt indicated by “negative evidence proneness,” whereby the auditor tends to weight evidence more heavily when the evidence supports the hypothesis that the financial statements are misstated and less heavily when the evidence supports the hypothesis that the financial statements are not misstated. Bamber et al. (1997) note that this perspective differs from a tendency to weight evidence more heavily when it confirms the anchor hypothesis (“confirmation proneness”) or disconfirms the anchor hypothesis (“disconfirmation proneness”). Bamber et al. find that auditors appear confirmation prone (they weight evidence more heavily when it confirms the initial hypothesis) and that they attend to risk (they weight evidence more heavily when the anchor hypothesizes misstatement), but Bamber et al. do not support PS per se. Brown et al. (1999) likewise provide evidence of confirmation proneness. Importantly, Bamber et al. note that auditors’ subjective evaluations of evidence strength could also affect belief revision in combination with evidence weights. As noted by Griffin and Tversky (1992), it is the combination of these evaluations that fully explain belief revision.

Another judgment literature relevant to PS examines how auditors’ judgments can be affected by “motivated reasoning” processes in ways that are not conscious. For example, a large psychological literature suggests that motivations cause people to search for and overweight evidence that supports their desired conclusion (Pyszczynski and Greenberg 1987; Kunda 1990; Russo et al. 1996; Lundgren and Prislin 1998; Russo et al. 2000) and to attend less to evidence that is inconsistent with their preferences (Ditto and Lopez 1992; Ditto et al. 1998). Many of the studies discussed in the fifth section (“incentives”) are not designed to determine whether effects of incentives on judgment are deliberate. Other studies attempt to make this distinction. Wilks (2002) provides evidence that auditors evaluate evidence and make judgments in a manner that is unintentionally biased in the direction of their supervisor’s preferences. Kadous et al. (2003) provide evidence that requiring auditors to assess the quality of client’s accounting (in addition to the acceptability of client’s accounting) can result in auditors being more likely to permit aggressive accounting, because the quality assessment encourages the auditor to engage in justification of their preferred client-favored alternative.

A somewhat related literature examines effects of time pressure on judgment. Time pressure can affect PS by providing an incentive for efficiency and also by affecting the sort of judgment processes that an auditor applies to a task. Time pressure has been shown

to decrease audit effectiveness while increasing efficiency (McDaniel 1990), encourage auditors to ignore irrelevant information, thus reducing the dilution effect (Glover 1997), focus auditors' attention on their primary task to the detriment of their attention on secondary tasks like attending to qualitative characteristics of misstatements that might indicate the presence of fraud (Braun 2000), and increase the likelihood that auditors prematurely sign off on procedures and engage in other inappropriate efficiency-enhancing behaviors (Kelley and Margheim 1990).

Finally, some studies explicitly focus on trade-offs between traits, knowledge and/or incentives in determining judgment. Awasthi and Pratt (1990) provide evidence that incentives improve judgment only for decision makers that have the requisite cognitive traits. Johnstone et al. (2002) provide evidence of interactions between incentives (provided via high audit risk) and knowledge when generating alternative ways to handle a client's aggressive revenue-recognition arrangement. Thus, while Figure 1 shows incentives, traits, and knowledge affecting judgment individually (links 3, 4, and 5), these factors may also have interactive effects.

DETERMINANTS OF SKEPTICAL ACTION (LINKS 1, 8, 9, AND 10)

As shown in Figure 1, skeptical judgment is an obvious primary driver of skeptical action. Many studies provide indirect evidence of this linkage by manipulating evidence, traits, knowledge or incentives in ways that are assumed to affect judgment and then testing for an effect on action. Some studies also provide evidence that, *given* the PS of a particular judgment, whether an auditor takes an action that exhibits PS depends on the auditors' traits and incentives. Key actions investigated include modifying the nature and extent of planned audit tests and willingness to waive adjustment of identified misstatements.

Audit-Planning Decisions

Many studies provide evidence of some linkage between risk assessments and audit planning decisions (Gaumnitz et al. 1982; Libby et al. 1985; Kaplan 1985; for a review see Allen et al. 2006). The presence of prior-year adjustments results in significant additional audit testing (Mock and Wright 1993), consistent with other archival research indicating the recurring nature of audit problems (Kreutzfeldt and Wallace 1986; Wright and Ashton 1989). Similarly, studies provide evidence that external auditors budget more hours when they believe that internal auditors are less reliable (because they know that internal auditors receive incentive pay and have a consulting role) (DeZoort et al. 2001).

Yet, studies suggest that auditors often remain relatively reluctant to change audit programs in response to risk factors. For example, Glover et al. (2000) provide evidence that auditors increase planned hours in response to analytical procedures evidence that indicates increased risk to a greater extent when the client had an explicit incentive to misstate and there was minimal corroborating evidence supporting the client's non-error explanation (illustrating an effect of knowledge on judgment and then on action), but also note that even in the low corroboration/high incentive treatment, less than 60 percent of auditors adjust their audit program. Similarly, Zimbelman (1997) and Glover et al. (2003) provide evidence that auditors who identify fraud risks are relatively more likely to increase hours devoted to currently planned procedures than to change the procedures that are to be performed, and Asare and Wright (2004) provide evidence that fraud risk assessments are not associated with planning more effective procedures.

One explanation for these findings is that auditors perceive their audit programs to already include a sufficiently large cushion to be able to accommodate increased risk.

Another is that auditors perceive countervailing incentives for audit efficiency that discourage increased testing. Consistent with this interpretation, Houston (1999) provides evidence that auditors increase budgeted hours to a lesser extent when clients are placing more pressure on the auditor to reduce fees, and Gramling (1999) provides evidence of increased reliance on internal auditors when external auditors face higher fee pressure. Another explanation is that auditors lack sufficient self-confidence and self-determination to make the necessary changes to their audit program in the face of time budgets and client resistance. Consistent with this interpretation, Hurtt's skepticism scale includes measures of self-confidence and self-determination that are designed to capture willingness to act, and Fullerton and Durtschi (2005) provide evidence that internal auditors are more likely to expand information search when they have a higher Hurtt score. Thus, lack of adjustment of audit programs in response to increased risk could indicate trade-offs between judged PS, traits, and incentives in determining skeptical action.

Adjustment Decisions

Another critical way in which PS can affect action is with respect to auditors' decisions about whether to require adjustment of a detected misstatement or aggressive accounting treatment. Prior research suggests a role for incentives, knowledge, and traits in addition to judgment.

Regarding incentives, much of the evidence discussed above that incentives affect auditors' PS at the judgment stage also applies to the decision stage, and indeed many studies focus primarily on the auditor's decision to waive misstatements. For example, Nelson et al. (2002) and Wright and Wright (1997) provide evidence that, holding materiality constant, auditors are more likely to waive detected misstatements for their larger clients.

Regarding knowledge, prior studies suggest that auditors' superior knowledge of GAAP is of critical importance when negotiating over contentious issues (Gibbins et al. 2001). Auditors tend to require less aggressive accounting when they can point to authoritative guidance that backs up their position (Nelson et al. 2002; Ng and Tan 2003).

Another interesting aspect of auditors' adjustment decisions involves the process by which they negotiate. For example, Sanchez et al. (2007) provide evidence that auditors who concede immaterial adjustments are more likely to be successful when negotiating over more significant adjustments. Ng and Tan (2003) provide complementary evidence that auditors concede in response to client concession. Tan and Trotman (2008) provide evidence that early concession by auditors is less effective than late concession. Trotman et al. (2005) provide evidence that auditors perform better in negotiations after they role-play the client side of the negotiation. One interpretation of this literature is that knowledge of client positions and good negotiating tactics enhance auditor performance, and therefore the apparent PS of auditor actions. Consistent with this view, audit partners take a harder stand than managers in proposing a higher initial proposed writedown, minimum writedown and expected writedown than managers (Trotman et al. 2008). However, it also may be the case that auditors differ in negotiation ability and conflict-management approach, such that auditor traits also drive negotiation performance (Goodwin 2002).

PS in Judgment versus Action

Shaub and Lawrence (2002) highlight the distinction between skeptical judgment and skeptical action. They note that skeptical judgments need to reach a threshold to create action, and incentives associated with budget, time pressures, peer and superior, or client can prevent action. In their study, 701 auditors from one Big 5 firm respond to eight short scenarios that include fraud opportunities. The auditors provide six skeptical judgment

probabilities, six additional testing probabilities (one measure of action), and eight client confrontation probabilities (another measure of action). Shaub and Lawrence (2002) classify auditors using both action measures and drop those that are classified differently depending on action, ending up with 375 auditors. They place the auditors in a taxonomy that crosses tendency toward skeptical thought (high versus low) against tendency toward skeptical action (high versus low), as shown in the following table:

Categories and Central Findings		Tendency to Think Skeptically	
		Low	High
Tendency to act skeptically	High	Measured skeptics 12% most concerned with prof ethics	Aggressive skeptics 26% least experienced
	Low	Reluctant skeptics 35% most experienced	Conflicted skeptics 26% least idealistic (pragmatists)

Shaub and Lawrence (2002) argue that measured skeptics are preferable, as they will tend to take action when warranted, but are not excessively (inefficiently) skeptical. One could also argue that, given the asymmetric loss function of accounting firms, aggressive skeptics that maximize PS might be preferred. Interestingly, Shaub and Lawrence’s (2002) data suggest that the most aggressive skeptics are the least experienced auditors, and the most reluctant skeptics are the most experienced auditors. This result ties back to knowledge studies that highlight more experienced and specialized auditors’ tendency to focus on non-error explanations for potential misstatement. Shaub and Lawrence (2002) interpret these results as suggesting the need for training that reigns in aggressive novice auditors, challenges older “reluctant skeptic” auditors to not view too much as a routine non-error, and teaches professional ethics to encourage measured skepticism.

Trade-Offs between Model Elements

There is evidence of substitution effects between model elements, particularly between traits and incentives. For example, prior research indicates that probability of detection has the greatest effect on auditors that have lower levels of moral development as identified by the DIT (Ponemon and Gabhart 1990; Sweeney and Roberts 1997; Gul et al. 2003). Falk et al. (1999) provide experimental economics evidence that auditors are more likely to compromise their independent judgments when they have lower DIT scores or are facing a client that is more important or has a higher probability of client loss resulting from disagreement. Yet, Schatzberg et al. (2005) provide evidence in an experimental economics framework that “misreporting and premium fees are more likely with higher than with lower moral reasoning subjects, and the moral reasoning effect diminishes as economic penalties increase in the market,” perhaps because lower-moral-reasoning participants were unable to cooperate. Lord and DeZoort (2001) provide evidence that auditors with high organizational commitment are less likely to allow misstatement, unless they are facing high “obedience pressure” (i.e., a partner telling them to waive an adjustment) or “conformity pressure” (a suggestion from the prior in-charge auditor). All of these studies can be viewed as identifying a level of incentive that changes the effect of moral principles.

HOW CAN AUDITING FIRMS ENHANCE PROFESSIONAL SKEPTICISM?

Hiring

Hiring affects PS by affecting traits and knowledge. Firms could try to screen for PS traits by using assessment techniques like the Hurtt (2007) scale, but at present it is unknown whether such assessment techniques have sufficient precision to screen effectively.

Alternatively, firms could publicize the importance of PS traits in the hiring process and when marketing the accounting profession in the hopes of discouraging applicants who have low PS traits from applying, similar to self-selection devices used in other areas (Salop and Salop 1976).

Firms presently screen for knowledge of new staff based on college performance, quality of undergraduate institution, etc. Hiring more experienced staff also allows screening based on passing the CPA exam and prior experience. While it is conceivable that firms could examine curricula to identify those most likely to emphasize PS, the standardized CPA exam ensures relatively standardized foci of accounting programs.

Training

Training affects PS by affecting knowledge, but also affects PS through incentives by providing auditors with knowledge of incentives. Training results in the most learning when it includes explanatory feedback (Bonner and Walker 1994) or auditors who have the knowledge to self-explain outcome feedback (Earley 2001). Prior research provides evidence that training can be used to enhance auditors' knowledge of frequencies and error categories (Butt 1988; Nelson 1993; Nelson et al. 1995; Bonner et al. 1996, 1997), suggesting that PS could be enhanced by having training highlight errors as opposed to nonerrors. Training about fraud indicators increases performance of students (Choo and Tan 2000; Carpenter et al. 2002) and experienced auditors (Fullerton and Durtschi 2005).

Another potential area for training involves negotiation techniques. PS would be enhanced if auditors could persuade the client to book corrections of all questionable items while remaining the firm's client, rather than conceding that potentially important misstatements not be booked or reaching an impasse that results in less attractive outcomes like audit qualification or client loss. As indicated previously, auditors could be taught to role-play the client's position prior to negotiation (Trotman et al. 2005), to delay concession somewhat in the negotiation process (Tan and Trotman 2008), and to make the client aware of concessions (Sanchez et al. 2007).

Performance Evaluation and Promotion

Performance evaluation can screen for PS traits, knowledge, and action. Ensuring that staff understands that PS is emphasized in the performance-evaluation process also affects staff incentives.

Similar to the hiring process, promotion decisions could attempt to screen directly for differences in traits and knowledge. However, the bulk of the performance evaluation process will attempt to infer PS traits, knowledge and judgment processes from subordinates actions. Prior research indicates that the particular characteristics used by the performance-evaluation process to distinguish high-performing auditors from other auditors depends on auditor rank, with high-performing staff distinguished by superior technical knowledge, seniors by superior technical knowledge and problem-solving ability, and managers by superior tacit managerial knowledge (e.g., staff management and efficient accomplishment of tasks) (Tan and Libby 1997). Prior research indicates that the assessment techniques used in research provide some explanatory power, as they correlate with real-life performance evaluations (Tan and Libby 1997).

The value of the evaluation process to enhancing PS depends on the accuracy of performance evaluations. Evaluation performance appears to improve with experience, with more experienced auditors better able to predict the judgments of other auditors with respect to highly judgmental accounting treatments (Jamal and Tan 2001), and higher performing managers less likely to allow their evaluations of subordinates' work to be affected by

subordinates' reputations (Tan and Jamal 2001). Yet, there is some noise and bias in the process, with auditors tending to be overconfident in their assessments of subordinates' technical knowledge, particularly with less knowledgeable subordinates, because auditors tend to over-rely on their own technical knowledge when assessing that of others (Kennedy and Peecher 1997).

An interesting question is the extent to which the performance-appraisal and promotion process explicitly or implicitly assesses and rewards PS. Evidence that tacit managerial knowledge differentiates audit managers could be driven by that group having high technical skills, but it also could suggest that a primary focus of performance evaluation of managers is efficiency, which could potentially undermine PS. Having the performance-appraisal process elicit and reward actions that demonstrate PS could create an incentive that affects judgment (via motivated reasoning) and action.

Review and Consultation

Audit firms have hierarchically organized review processes that could be used to enhance PS in the audit process (Solomon 1987). If the promotion process rewards PS, reviewers should be more likely to have traits, knowledge and judgment processes that favor PS (of course, the opposite is true if the promotion process emphasizes efficiency and retaining clients over PS). As a consequence, a review allows the reviewer to augment the PS of reviewees. As part of the review process, the reviewer also enhances the knowledge of reviewees. Given that reviewers play a role in performance evaluation, reviewers set incentives for reviewees (Rich et al. 1997).

Prior research provides evidence of the offsetting knowledge benefits of review. Reviewers who are managers detect relatively more conceptual errors and fewer mechanical errors than do those who are seniors (Ramsay 1994). Reviewees tend to focus on evidence that supports their conclusion, and reviewers attend more to evidence that contradicts a reviewee's conclusion (Libby and Trotman 1993; Reimers and Fennema 1999). Reviewers tend to invest more effort when reviewing the work of someone they do not know (e.g., reperforming more of the work) (Asare and McDaniel 1996).

However, reviewees' awareness of the role of the reviewer in performance evaluation could have negative effects if it encourages reviewees to bias their work in some way (Rich et al. 1997; Gibbins and Trotman 2002; Fargher et al. 2005). Reviewer judgments are affected by reviewee conclusions (Yip-Ow and Tan 2000). Reviewees tend to document more evidence that is consistent with their conclusions (Ricchiute 1999), so reviewers may lack sufficient information to debias reviewee judgments. However, reviewers who are sensitive to the potential for preparers biasing their work are better able to counteract that bias (Tan and Trotman 2003). Reviewers make allowances when reviewee's workpapers obviously emphasize information consistent with reviewee conclusions (Tan and Yip-Ow 2001), and reviewers are likely to more critically evaluate workpapers when they believe there is high risk of reviewee error or user reliance on the financial statements (Rich 2004).

Research suggests that one way to enhance PS is for reviewees to understand that PS is a priority of the reviewer. When auditors are accountable to a reviewer whose preferences they know (e.g., a reviewer who believes client explanations should not be taken at face value), anticipation of that preference affects their evidence search (Turner 2001), documentation and information weighting (Peecher 1996), and their memory for audit evidence (Wilks 2002). On the other hand, when auditors are accountable to a reviewer with unknown views, they exhibit better consensus and self-insight (Johnson and Kaplan 1991) and document a higher quantity of justifications (Koonce et al. 1995), and when auditors face conflicting sources of accountability, they tend to spend more time, consult others, and

make less extreme decisions (Jensen 2004). The review medium can also matter, with preparers who anticipate a face-to-face review being more effective but less efficient than preparers who anticipate interacting with their reviewers electronically or who do not anticipate being reviewed (Brazel et al. 2004).

Other consultation arrangements may also enhance PS. For example, SAS No. 99 requires that audit teams brainstorm to identify fraud risks. Carpenter (2007) provides evidence that such sessions reduce the quantity of ideas, but not the number of high-quality ideas, and that fraud risk assessments are higher after such brainstorming sessions, particularly when fraud is present. Auditors can appeal to concurring partners, centralized technical staff or risk-management authorities when dealing with contentious clients about potential misstatements. In these circumstances, incentive and judgment problems can be reduced by appealing to people who are relatively more removed from the client (Favere-Marchesi and Emby 2005). It is important to ensure that consultation is not merely a formality, given evidence that auditors perceive documented conclusions as more justifiable if the preparer consulted other peers within the firm, regardless of whether that consultation is followed (Kennedy et al. 1997). Auditors can also appeal to the client's audit committee as a way to reduce pressure from client management (Goodwin 2002), but mandated communication with the audit committee (as required by SAS 89) may not reduce such pressure and encourage less aggressive reporting if auditors do not believe the audit committee is effective at requiring accurate reporting (Libby and Kinney 2000).

Decision Aids

Decision aids can enhance PS by programming particular reactions to evidence that reflect desired traits, knowledge and judgment. If decision aids are not overruled, they can address effects of incentives.

Many decision aids augment knowledge or facilitate its retrieval. For example, simple aids like red-flag checklists ensure that no questions are overlooked, but may in fact discourage PS by omitting or under-emphasizing some negative indicators (Pincus 1989; Asare and Wright 2004). Similarly, documentation requirements can serve as a decision aid, e.g., by requiring auditors to assess both their favored explanation and competing explanations for unexpected results of analytical procedures (Koonce 1992b) and to consider the sufficiency of explanations (Anderson and Koonce 1995, 1998). Eliciting fraud-risk factors at lower levels of aggregation, rather than holistically, can increase auditors' sensitivity to risks of fraud and nonfraud (Zimbelman 1997) or aspects of the fraud triangle (Wilks and Zimbelman 2004). However, requirements to document the fraud-risk environment can depress fraud risk assessments by focusing auditors on the preponderance of positive information in an evidence set (Agoglia et al. 2003).

Simple instructions also can be used to encourage PS. For example, instructions to form independent expectations can be used to control anchoring on client-provided book values in analytical review (McDaniel and Kinney 1995). A prompt to consider the strength of evidence can discourage over-reliance on the results of weak analytical procedures (Glover et al. 2005).

Other decision aids facilitate the retrieval of knowledge, but then use that information as inputs to some mechanical aggregation rule. For example, auditors' frequency knowledge or risk assessments can be elicited and then combined mechanically to avoid common math errors (Jiambalvo and Waller 1984; Bonner et al. 1996). More sophisticated approaches augment knowledge and aggregate expert combination algorithms to assess risk associated with client acceptance and continuance (e.g., Bell et al. 2002) or fraud (e.g., Eining et al.

1997; Bell and Carcello 2000). In these sorts of decision aids, weights associated with particular evidence can be adjusted to enhance PS.

With all decision aids, part of the challenge is to encourage reliance and discourage overconfidence in individual judgment (Whitcotton 1996; Eining et al. 1997). For example, evidence suggests that some auditors may circumvent sample-size-planning decision aids by backing in to the inputs necessary to produce the desired output (Kachelmeier and Messier 1990; Messier et al. 2001). If decision aids are intended to enhance PS, it is important to ensure that auditors' incentives do not favor audit efficiency and client goodwill to an extent that encourages them to circumvent the aid.

Changing Incentives

Incentives can affect judgment in at least two ways. First, to the extent that PS is reduced by judgmental mistakes that are caused by lack of effort, incentives can be used to increase effort and therefore reduce mistakes. For example, recency effects in belief revision can be reduced by accountability (Kennedy 1993), anticipation of review (Messier and Tubbs 1994), and requirements to document (Cushing and Ahlawat 1996). Second, as discussed previously, incentives can affect judgment via motivated-reasoning processes that drive evidential search, evaluation and weighting to outcomes that are favored by the incentives.

Incentives can also affect actions, conditioned on judgment. For example, a strong emphasis on PS could favor over-auditing regardless of preliminary risk assessments. Similarly, professional standards that require performance of particular procedures regardless of assessed risk (e.g., confirmation, inventory observation) provide compliance incentives that divorce action from risk judgment. Interestingly, some research suggests that fraud-risk assessment can be more difficult when auditor and manager behavior is interdependent (Bloomfield 1995, 1997), supporting efforts to ensure compliance with minimum standards of audit effort. Of course, strong emphasis on efficiency could favor under-auditing in ways that compromise PS. Premature signoff of auditing procedures is one example of this sort of behavior (Donnelly et al. 2003).

One concern is that some incentives favoring PS (e.g., potential for litigation, censure, and reputation loss from failed audits) are probabilistic and far in the future, so may not be weighted as much as current incentives (Moore et al. 2006). Some research evidence also suggests that the potential for formal sanctions like the threat of disciplinary actions by professional organizations are of less concern to individual auditors than are others, such as litigation risk and peer-review risk (Shafer et al. 1999). Of course, firm-level concern over all such sanctions can encourage quality control efforts that result in peer-review risk, such that indirect sanctions still have a direct motivating effect on auditors (Nelson 2006).

Changing Tasks and Institutions

Some judgment mistakes that reduce PS occur because of hard-wired judgment difficulties, and therefore are not responsive to incentives (Kennedy 1995). In those circumstances it may be preferable to change the task, e.g., by removing access to book values when auditors form expectations in analytical review to prevent them from anchoring on them and therefore giving too much credence to management representations (McDaniel and Kinney 1995).

More broadly, more frequent auditor rotation can be used by firms who desire to reduce incentive problems that might occur when auditors interact with clients on a long-term basis. Of course, a concern is that more frequent auditor rotation could reduce client-specific

knowledge that allows the auditor to anticipate audit problems and thus maintain PS. Similarly, different contracting arrangements could affect PS by changing incentives. For example, Ronen (2002) advocates a system in which auditors are hired by insurance companies rather than their clients.

Finally, auditors' PS may be pressured by changes in financial reporting rules. For example, prior research suggests that bright-line standards appear to facilitate client transaction structuring, but also help auditors negotiate more effectively over misstatements that are demonstrably wrong (Nelson et al. 2002). Moving to more "principal-based" accounting standards (SEC 2006) could reduce transaction structuring but also reduce auditors' knowledge and negotiation advantage in many circumstances.

DIRECTIONS FOR FUTURE RESEARCH

Descriptive Validity of the PS Model

One useful area for future research is to test the descriptive validity of the PS model. One way to do this would be to assess the extent to which alleged failures of PS are attributable to various model elements. For example, the subset of SEC enforcement actions that allege failure of PS could be analyzed to assess the elements of the model that appear to have caused the failure. Survey methodologies might also be used to generate instances of failed PS and perceptions as to cause of failure. The goal of such studies would be to identify critical elements of the model by identifying those that appear most important in explaining failures of PS, but such studies could also help identify the stages of the audit for which lapses of PS are most likely to be alleged, as well as the cues upon which the SEC bases allegations of insufficient PS.

Research could also assess more precisely the structural form of the model. For example, the model shows incentives, traits and knowledge independently affecting both skeptical judgment and skeptical action. To what extent do these model elements interact in their effects on judgment and/or action? As indicated previously, a few prior studies (e.g., Awasthi and Pratt 1990; Johnstone et al. 2002) provide evidence of interactions between the effects of incentives, knowledge and traits on judgment, but relatively little research investigates those trade-offs. Also, to what extent do model elements have redundant effects on both judgment and action? For example, traits might affect the amount of PS in judgment as well as the tendency to act given a judgment, and thus affect PS in action to a greater extent than auditors are conscious of or intend.

Research Investigating Model Elements

Future research should also investigate issues relevant to specific model elements. For example, regarding auditor knowledge, a paradox is that increased knowledge via experience and specialization provides many benefits, but also leaves auditors vulnerable to a few predictable types of error that can compromise PS (e.g., developing knowledge of the high frequency of non-error explanations; filling in missing parts of the evidential puzzle with evidence indicating non-errors). Similarly, "top-down" audit approaches that focus the auditor on client strategy can encourage the auditor to overlook evidence in some situations (Ballou et al. 2004). Future research could consider how to augment professional judgment with training (e.g., conveying salient error frequencies), decision aids or consultation arrangements to avoid these problems.

Regarding traits, an interesting question is the extent to which various traits (tendency toward doubt as captured by the Hurtt scale versus problem-solving ability versus ethical predisposition and moral reasoning) affect different dimensions of PS, both individually or in interaction with other model elements. Carpenter (2004) provides evidence that elements

of the Hurtt score are affected in different ways by a brainstorming task, suggesting that some aspects of the scale may not be capturing immutable traits. This topic is particularly important because different traits could interact in different ways with knowledge and incentives to determine PS in judgment and in action. For example, knowledge could moderate the effect of tendency toward doubt on judgment, with doubt more effective when auditors have the knowledge to identify particular problems. Ethical predisposition could moderate the effect of incentives on action, with more ethical auditors less affected by changes in incentives. Research could also examine the effectiveness of screening mechanisms like the Hurtt scale to identify auditors with a higher predilection for PS.

Regarding incentives, research could assess the potential for explicit positive incentives for PS-related actions. To the extent that PS-related actions produce inefficiencies, auditors may currently face direct and indirect incentives to avoid them. Can interventions like documentation be used to highlight and reward justified inefficiencies? To what greater extent would audit judgment and action reflect more PS if the performance-evaluation process explicitly viewed exhibiting PS in a more positive light?

Regarding audit judgment processes, future work could seek to better understand underlying reasons for persistent findings of confirmation bias in auditing. Can this tendency be exploited by reframing questions such that confirmation bias favors PS (Bedard and Graham 2002)? More generally, the psychological processes governing application of principles-based professional standards and implementation guidance can encourage practitioners to overestimate the chance that their case qualifies for a particular treatment. Depending on the nature of the case and the implementation guidance, this tendency could reduce PS (Clor-Proell and Nelson 2007). How can standards and implementation guidance be written or decision aids developed to reduce that tendency? How does the way in which standards and professional guidance are written potentially improve or harm PS?

Another question concerns the effects of audit contract structure on auditor knowledge and incentives. To what extent does the form of the contract structure (e.g., fixed price versus cost plus) affect auditor incentives relevant to PS? Also, how is PS exhibited by the audit team affected by rotation of staff, partners, and firms? These different rotation possibilities differ in their implications for knowledge loss, mitigation of formal and social incentives for continuance, and responsibility for past actions. What circumstances determine the optimal rotation level and frequency? Particularly in light of the recursive nature of the model shown in Figure 1, when does rotation and auditor change undermine PS?

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