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Auditing Complex Estimates: The Interaction of Audit-Team Specialists' Caveats and Client Source Credibility

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Auditing Complex Estimates: The Interaction of Audit-Team Specialists' Caveats and Client Source Credibility

Abstract: Audit-team specialists (valuation specialists employed by the audit firm) who evaluate a subset of the assumptions integral to a complex estimate often include *caveats* on otherwise-clean results to communicate reservations about certain assumptions to auditors. Although caveats can contain interpretation that may improve auditors' judgments about estimates, auditors do not uniformly view caveats as helpful and the effect of caveats on auditors' judgments has not been explored. In this study, I investigate the conditions under which auditors benefit from audit-team specialists' caveats. Given the inherent subjectivity in estimates and the difficulty in integrating the results of all of the audit procedures to conclude on an estimate overall, I expect auditors to discount audit-team specialists' caveats unless another cue has already increased auditors' concern about an estimate. One important cue in the estimates arena is the perceived credibility of the source of the estimate because audits of estimates often require relying on clients' assertions about future events, for which relatively little objective evidence exists. I experimentally examine how a caveat interacts with auditors' perceptions of their clients' source credibility to affect their judgments about estimates. Drawing on theories of elaboration and persuasion, I predict and find that auditors' evaluation of evidence related to a biased estimate and subsequent judgments benefit from a caveat when auditors perceive the initial preparer of an estimate to have relatively low source credibility; auditors who perceive the initial preparer to have higher source credibility discount the caveat and judge a biased estimate as more reasonable. This initial evidence about the interactive effect of caveats and perceived client source credibility has implications for future research on improving audits of estimates.

Auditing Complex Estimates: The Interaction of Audit-Team Specialists' Caveats and Client Source Credibility

I. INTRODUCTION

Audit-team specialists (i.e., valuation specialists without auditing backgrounds employed by the audit firm) who evaluate a subset of the assumptions integral to a complex estimate often include *caveats* on otherwise-clean results to communicate reservations about certain assumptions to auditors.[1] Caveats can potentially improve auditors' judgments about estimates by helping auditors, who must integrate all of the audit evidence about individual assumptions to conclude whether an estimate is reasonable overall, to understand the implications of audit-team specialists' results for other assumptions. Regulators and auditors have raised concerns about the quality of audits of estimates, driven in part by the difficulty auditors have integrating all of the evidence related to an estimate (PCAOB 2010e, 2011; Cannon and Bedard 2013; Griffith et al. 2014). However, research has not examined the effects of caveats on auditors' integration of evidence and subsequent judgments. Audit-team specialists' use of and auditors' views about the usefulness of caveats vary in practice, and auditing standards do not contemplate audit-team specialists' use of or auditors' responses to caveats (Griffith 2013).

In this study, I investigate the conditions under which auditors benefit from audit-team specialists' caveats. Given the inherent subjectivity in estimates and the difficulty in integrating all of the evidence related to an estimate, auditors may discount caveats because a caveat on its own does *not* identify a misstatement. Rather, a caveat communicates an audit-team specialist's reservation about an assumption, despite concluding the assumption is reasonable. Thus, auditors may easily dismiss caveats in the absence of heightened concern about an estimate. I

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[1] Complex estimates involve multiple assumptions and/or computationally difficult models (Griffith et al. 2014). Examples include level 2 or 3 fair values, goodwill and other impairments, valuation allowances, loss reserves, stock option expenses, and derivatives. Hereafter, I refer to complex estimates simply as "estimates."

expect caveats to help when auditors believe they need to scrutinize a client's estimate more closely, such as when they believe a client is less able to prepare an estimate free of errors and bias, and to discount caveats otherwise. I expect the perceived source credibility (i.e., expertise and objectivity) of an estimate's initial preparer to be especially influential because auditors must often rely on clients' assertions about future events when auditing estimates, as relatively little objective evidence exists (PCAOB 2009). However, over-reliance on clients' information increases the chance that auditors overlook potential issues in estimates, especially when issues are indicated by patterns or inconsistencies among assumptions that appear reasonable individually (Griffith et al. 2014).[2]

To test this expectation, I conduct an experiment in which I manipulate the presence or absence of a caveat on the audit-team specialist's results and measure auditors' perceptions of the source credibility of the initial preparer of a client's estimate. In the caveat condition, the audit-team specialist's memo contains a caveat noting that the assumptions tested by the audit-team specialist appear to be aggressive, despite concluding that each assumption falls within a reasonable range. Auditors review the evidence obtained to test the five key assumptions underlying an estimate used in Step 1 of an annual goodwill impairment test. Either the audit team or the audit-team specialist has tested each assumption and concluded it falls within a reasonable range. That is, each assumption appears reasonable individually. Importantly, several of the assumptions fall at the estimate-increasing end of the reasonable range, and the

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[2] For example, a client's estimate might rely upon assumptions that future revenue will increase and future expenses will decrease. Each assumption (i.e., increasing revenue, decreasing expenses) may be individually reasonable and supported by management's plans to (1) open new retail stores to increase revenue and (2) cut back on retail sales personnel to decrease expenses. Yet, these two assumptions are inconsistent with each other because the planned increase in stores suggests that management will have to *increase*, not decrease, sales personnel to staff incremental stores. Thus the two assumptions in combination suggest the estimate may be based on unreasonable assumptions even if each assumption appears reasonable on its own.

cumulative impact of adjusting the assumptions toward the middle of the range causes the client to fail Step 1 of the goodwill impairment test.

I expect the effect of the caveat in the audit-team specialist's memo to depend on auditors' perceptions of the source credibility of the initial preparer of the estimate. The evidence and assumptions underlying an estimate can be thought of as evidence supporting an overall persuasive message about an estimate (Peecher 1996; Rich et al. 1997a). People engage in more evaluative and systematic processing, or elaboration, on the evidence supporting a persuasive message when they are more motivated to do so, provided that the task demands do not exceed their capacity to elaborate (Petty et al. 1997; Kruglanski et al. 2007). Greater elaboration causes more accurate assessments of the validity of a message based on the underlying evidence. Auditors' difficulties evaluating assumptions (e.g., PCAOB 2010a, Griffith et al. 2014) suggest that they do not always elaborate sufficiently on evidence or accurately assess the validity of estimates. An audit-team specialist's caveat may reduce the task demands required to elaborate by providing interpretation of audit-team specialists' results that helps auditors understand the implications for and patterns among the *rest* of the assumptions. However, this will only help auditors if another signal such as lower perceived source credibility has already motivated them to elaborate by heightening their concerns about an estimate. Greater elaboration on the evidence related to estimates should improve auditors' judgments about estimates because it fosters integration of the evidence related to each assumption.

I predict and find that auditors who both receive a caveat and perceive the initial preparer of an estimate as relatively less credible elaborate more on the evidence, more effectively identify potential issues, judge a biased estimate as less reasonable, and are more likely to recommend adjusting a biased estimate than auditors in other conditions. Mediation analyses

3

reveal that elaboration contributes to auditors' issue identification, and issue identification contributes to auditors' judgments of how likely the estimate is to be reasonable. This analysis supports elaboration and issue identification as the mechanisms by which the effects on auditors' identification of issues in and subsequent judgments about estimates occur.

This study makes several contributions. First, it provides insight into the conditions under which caveats help auditors. I find that caveats help auditors evaluate estimates when they perceive the initial preparer of an estimate to be less credible, but not when they perceive the preparer to be more credible, suggesting that auditors do not always make full use of their specialists' expertise. Caveats provide interpretation of audit-team specialists' results that can help auditors understand how to relate those results to the results of testing other assumptions and to the estimate overall. However, auditors appear to disregard the interpretation contained in caveats when they perceive higher source credibility. Thus, auditors do not always effectively use available cues about estimate quality, despite audit-team specialists' valuation expertise that might enable them to identify potential issues that auditors would otherwise miss.

Second, this study shows that greater elaboration on the evidence related to estimates can improve these audits when the assumptions collectively suggest an issue but do not appear problematic individually. A crucial, yet difficult, step in auditing estimates is integrating the evidence related to each assumption, particularly when the assumptions appear reasonable individually (PCAOB 2010e, 2011; Griffith et al. 2014). Recent research has begun to examine how to promote integration of evidence to improve audits of estimates (Griffith et al. 2013), and research on fraud detection demonstrates that more integrative, critical thinking helps auditors integrate cues to identify problems that are not apparent when cues are considered individually

(Hoffman and Zimbelman 2009; Hammersley et al. 2011; Simon 2012). This study shows that when a caveat increases elaboration, this helps auditors integrate evidence related to estimates.

Third, this study extends auditing research on source credibility. While prior research shows that auditors rely more on evidence from more credible sources (Hirst 1994; Anderson et al. 2004), it does not examine the process by which this occurs or how the credibility of one source of evidence affects auditors' reliance on evidence from other sources. I show that source credibility works by affecting the extent of elaboration on evidence presented, which affects reliance on that evidence and the perceived reasonableness of a biased estimate.

Finally, I contribute to psychology research on the determinants of elaboration in the persuasion paradigm. This research characterizes source credibility as a peripheral cue to be processed once some other determinant causes a person to elaborate more or less on the central arguments supporting a persuasive message (e.g., Petty et al. 1997; Crano and Prislin 2006; Bohner and Dickel 2011). In the audit setting, however, source credibility itself can be a relevant determinant of motivation to elaborate. I provide evidence of this unexplored role of source credibility in persuasion.

The remainder of this paper proceeds as follows. The next section describes the challenges unique to and audit-team specialists' role in auditing estimates. The third section develops the theory and hypotheses. The fourth section describes the research design. The fifth section discusses the results, and the final section discusses the implications and future research directions suggested by this study.

II. BACKGROUND

Identifying Potential Misstatements in Estimates

The inherent subjectivity and uncertainty in estimates require auditors to evaluate the overall reasonableness, rather than verify the accuracy, of estimates by evaluating the reasonableness of the model, inputs, and assumptions used to determine an estimate (PCAOB 2009; Griffith et al. 2014). Auditors must consider assumptions individually and in combination because assumptions that appear reasonable individually may be inconsistent with each other (e.g., increasing sales but decreasing cost of sales) or may form a pattern suggestive of management bias (e.g., several assumptions at the estimate-increasing end of the range). Estimates are prone to bias because they rest upon assumptions about future performance, discount rates, and industry conditions that are subjective and difficult for auditors to evaluate, and consequently could be biased by management (Martin et al. 2006; Lundholm 1999). The PCAOB has expressed concern that management faces increased pressures that may lead to greater bias in estimates (PCAOB 2011), and several studies document the existence of bias that survives the audit in a variety of estimates (for a review see Bratten et al. 2013). Thus, misstatements in estimates may only be evident to auditors when they consider the assumptions in combination (PCAOB 2011, ¶51-55).

The increasing complexity and volume of estimates included in financial statements has led a growing number of clients to use third party valuation preparers (hereafter, *client third parties*) to prepare their estimates (Dichev et al. 2013). Several accounting and non-accounting firms offer client third party services. Management provides or influences the inputs used by client third parties, so estimates prepared by third parties can still contain management bias (Deloitte 2012). Small tweaks to one or more subjective inputs can change an estimate by an

amount many times greater than auditors' materiality thresholds, even when the tweaks do not push inputs outside of auditors' reasonable ranges (Christensen et al. 2012). Thus, auditors must evaluate the cumulative effect of seemingly innocuous changes in assumptions on estimates and consider the potential for bias in assumptions, even if a client third party prepares the estimate.

Audit-Team Specialist Involvement in Auditing Estimates

The prevalence of estimates has also led the major accounting firms to employ valuation specialists to assist their own auditors in evaluating the reasonableness of some elements in estimates (Smith-Lacroix et al. 2012; Griffith 2013).[3] These audit-team specialists have finance and valuation backgrounds rather than auditing backgrounds, allowing them to provide valuation expertise that auditors tend to lack (Martin et al. 2006; Griffith et al. 2014). Audit-team specialists typically evaluate the method used to develop estimates and evaluate assumptions about discount rates, market benchmarks, and general industry or economic trends. In contrast, auditors typically evaluate assumptions about clients' financial measures such as future revenues and expenses. Auditors are responsible for concluding whether an estimate is materially misstated (PCAOB 2003, ¶12-14), even though they perform only a subset of the procedures to test the estimate. Therefore, auditors review the work prepared by both the audit team and the audit-team specialist to make their overall conclusions about estimates.

Audit-team specialists document their work in a memo that details the work performed, results obtained, and conclusions reached about each item or assumption that they evaluate. Audit-team specialists' memos generally do not contain an overall conclusion about the estimate, unlike other audit work papers (Rich et al. 1997b). Rather, audit-team specialists conclude on each assumption tested, often by stating whether the assumption falls within a reasonable range.

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[3] In a related study, I interviewed 28 audit partners and managers regarding their use of audit-team specialists when auditing fair values. The description of the institutional setting contained in this section is based on those interviews. For further institutional detail, see Griffith (2013).

Audit-team specialists' memos often contain *caveats* on the conclusions about individual assumptions.[4] Caveats communicate audit-team specialists' reservations about the assumptions they tested based on their limited view of the estimate. Caveats thus convey uncertainty about assumptions that audit-team specialists have nevertheless concluded are reasonable.

When auditors review audit-team specialists' memos, they must integrate the results of audit-team specialists' work with the rest of the audit team's work to determine whether estimates contain misstatements. Detecting potential misstatements in estimates often requires recognizing a pattern among pieces of evidence that individually appear reasonable, which is difficult for auditors to do (PCAOB 2011; Griffith et al. 2014). Integrating the evidence related to each assumption is especially important when evaluating management bias in estimates because auditors must evaluate the cumulative effect of several biased assumptions that individually appear reasonable (PCAOB 2010c, ¶27, 2011; Griffith et al. 2014). This includes the assumptions tested by the audit team and by the audit-team specialist. Yet, some auditors seem to scan audit-team specialists' memos for conclusions without carefully considering the implications of the audit-team specialist's work on the assumptions tested by the audit team or the estimate overall (Griffith 2013).[5]

III. THEORY AND HYPOTHESES DEVELOPMENT

Caveats in Audit-Team Specialists' Memos

Caveats communicate audit-team specialists' reservations by alerting auditors to items that may need additional follow-up by the audit team, even though the audit-team specialist has

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[4] Eighteen of 28 auditors interviewed noted that audit-team specialists use caveats (Griffith 2013).

[5] For example, when the audit-team specialist's memo concludes that an assumption is reasonable, auditors may simply accept and rely on that conclusion without carefully evaluating all of the information documented to support that conclusion. In an effort to curb this behavior, one audit partner tells his audit teams, "Don't just get those [memos] and stick them in the workpapers. Make sure you read them and know what's in them" (Griffith 2013, 32).

concluded that the item or assumption tested is reasonable (Griffith 2013).[6] Caveats can recommend changes to a client's process, point out open items that the audit team has yet to complete, or warn auditors of potential issues based on the audit-team specialist's interpretation of the results of the (limited) testing s/he performed. The use of caveats varies in practice, and auditing standards do not contemplate the existence of caveats or auditors' responses to them.[7]

Auditors view audit-team specialists' caveats as either helpful or superfluous. Caveats may identify immaterial issues because audit-team specialists tend to lack the audit background necessary to distinguish significant issues from quantitatively and/or qualitatively immaterial issues. While some auditors rely on caveats to understand how to follow up on audit-team specialists' work, others ignore or discount caveats because they believe that audit-team specialists include caveats to limit responsibility for further work or that caveats identify insignificant issues. A caveat is most likely to be helpful when it provides interpretation of the audit-team specialist's results that helps auditors understand the implications of those results for the rest of the assumptions and the estimate overall. For example, such a caveat might note that one or more assumptions, while falling within the range(s) deemed reasonable by the audit-team specialist, appear aggressive (i.e., fall at the estimate-increasing end of the range). This could help auditors recognize greater potential for management bias in all of the assumptions—not just those tested by the audit-team specialist—that may mean the estimate is materially biased.

Thus, a caveat might help auditors *elaborate* on the evidence related to an estimate, which persuasion theories suggest will improve auditors' assessment of the validity of the

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[6] The interviews with auditors form the basis for the discussion of caveats in audit-team specialists' memos in this section. For further detail, see Griffith (2013).
[7] Current U.S. standards consider audit-team specialists to be members of the audit team (see AU Section 336, "Using the Work of a Specialist" (PCAOB 2003, ¶5)). Consequently, audit-team specialists' work and auditors' review of their work is governed by Auditing Standard No. 10, "Supervision of the Audit Engagement," which does not provide guidance on caveats in audit-team specialists' memos (PCAOB 2010a).

message (i.e., estimate) supported by the evidence (Bohner and Dickel 2011; Crano and Prislin 2006; Petty et al. 1997). Elaboration involves attending to a message and related evidence, accessing relevant knowledge from memory, scrutinizing and elaborating on evidence in light of the knowledge accessed, and making inferences about the validity of evidence and its relation to the message (Crano and Prislin 2006; Petty and Cacioppo 1986; Petty et al. 1997). When people do not elaborate, they rely on simple, easily accessible heuristic cues to judge a message's validity rather than evaluating the evidence related to the message (Petty et al. 1997; Chaiken 1980; Petty and Cacioppo 1984).

Greater elaboration on the evidence yields more accurate assessments of message validity, but elaboration requires that task demands not exceed a person's capacity for elaboration (Harkins and Petty 1981; Moore and Reardon 1987; Petty et al. 1997; Kruglanski et al. 2007). Integrating the audit team's and audit-team specialist's results and forming an overall conclusion on an estimate has high task demands because auditors often lack valuation knowledge and as a result struggle to evaluate the evidence related to estimates (Martin et al. 2006; Griffith et al. 2014). A caveat can reduce the task demands required to elaborate by providing interpretation of the results of audit-team specialists' testing that helps auditors understand the implications for and patterns among the rest of the assumptions. In audits of estimates, elaboration is likely to help auditors integrate the results of testing individual assumptions to assess the validity of the estimate overall.

However, auditors' views about the usefulness of caveats are mixed, so caveats' effects likely depend on other contextual features. Auditors view caveats after completing most of the testing of the assumptions that are the audit team's responsibility. Auditors form an initial impression about an estimate based on their testing, and this impression influences how they

10

respond to a caveat. If the initial impression is one of concern about an estimate, auditors are likely to be more motivated to carefully consider a caveat than if the initial impression is one of confidence. A caveat constitutes a piece of evidence related to an estimate to be processed and elaborated upon, so it is more likely to help when auditors are sufficiently motivated to elaborate on the evidence to accurately assess the validity of a message (Crano and Prislin 2006; Bohner and Dickel 2011). In the absence of such motivation, auditors are likely to discount a caveat because the audit-team specialist has concluded that the individual assumptions tested are reasonable, despite the caveat.

Source Credibility

The perceived source credibility (hereafter, source credibility) of the initial preparer of a client's estimate is an especially important contextual factor in auditing estimates because auditors rely to a greater extent on clients' assertions about future events, as little objective evidence exists for estimates relative to historical cost-based accounts (PCAOB 2009). Source credibility refers to the degree to which a person believes a source has provided accurate and unbiased information, and it increases with expertise and objectivity (Pornpitakpan 2006; Birnbaum and Stegner 1979). Thus, auditors' perceptions of the source credibility of an estimate depend on the perceived expertise and objectivity of the initial preparer of the estimate. Factors affecting perceived competence determine expertise; factors affecting perceived opportunity, desire, and incentives to bias a message determine objectivity (Pornpitakpan 2006). In auditing, clients' integrity relative to other clients (Peecher 1996; Goodwin 1999); clients' incentives to manage earnings (Anderson et al. 2004); the competence of the source (Bamber 1983); and whether the source is a member of the audit firm, client management, or an external organization (Hirst 1994; Joyce and Biddle 1981; Goodwin and Trotman 1996) affect source credibility.

I expect source credibility to influence auditors' motivation to elaborate on the evidence related to estimates. Motivation to elaborate refers to the extent to which a person attempts to elaborate on evidence related to a message (Petty and Cacioppo 1986; Petty et al. 1997). Higher motivation increases elaboration provided that task demands do not exceed a person's capacity to elaborate (Petty et al. 1997; Petty and Cacioppo 1986). The risks and benefits associated with accurately assessing message validity influence motivation to elaborate (Petty et al. 1997). The chance that a misstatement exists in an estimate is greater when the estimate comes from a less credible source, so lower source credibility increases the risk to auditors of inaccurately assessing the validity of an estimate. Thus, lower source credibility should increase auditors' motivation to elaborate on evidence related to estimates.

Interaction of Caveat and Source Credibility

To elaborate on evidence related to a message, a person must have sufficient motivation to meet task demands (Petty and Cacioppo 1986; Kruglanski et al. 2007). In a demanding task such as integrating the evidence related to an estimate, auditors with high motivation may require help in the form of reduced task demands to elaborate on the evidence. Thus, I expect the reduced task demands resulting from a caveat to combine with increased motivation resulting from low source credibility to cause higher elaboration. Even if auditors perceive the initial preparer to be less credible, without a caveat they will be less likely to engage in high elaboration because high task demands preclude them from elaborating as extensively on evidence related to an estimate.

In contrast, when auditors perceive the initial preparer of a client's estimate to be more credible, I expect auditors to be less motivated to elaborate because the initial preparer's source credibility does not prompt the auditor to doubt the reliability of the estimate or evidence related

12

to it. This will result in less elaboration on the evidence related to an estimate, and greater

reliance on the peripheral cue of the initial preparer's source credibility when judging an overall

estimate. The source credibility of one cue can influence processing and weighting of other cues

in judgments (Petty and Cacioppo 1984; Chaiken and Maheswaran 1994; Grewal et al. 1994), so

I expect higher source credibility to decrease auditors' consideration of a caveat. Moreover,

auditors will be less likely to relate the interpretation provided by a caveat to other evidence or to

benefit from the reduced task demands resulting from a caveat because they lack the motivation

to do so when source credibility is higher. Therefore, during auditors' review of the evidence

related to an estimate, I expect a caveat to interact with the source credibility of the initial

preparer of a client's estimate to affect auditors' elaboration on the evidence. I formally state

this hypothesis below and illustrate all hypotheses in Figure 1.

> **H1:** Auditors who both receive a caveat and perceive that an initial preparer is less
> credible will elaborate more than auditors who do not receive a caveat or auditors who
> perceive that an initial preparer is more credible.

[Insert Figure 1 here]

I expect the increased elaboration caused by the interaction of a caveat and low source

credibility to help auditors identify potential issues in an estimate. Auditors struggle to

recognize when individually-biased assumptions cumulatively have a material impact on an

estimate (PCAOB 2011; Griffith et al. 2014), because individual pieces of evidence may not

appear to be problematic on their own and only suggest a misstatement when considered together

(Brown and Solomon 1990, 1991; Bedard and Biggs 1991; Hammersley 2006). Recognizing

problematic patterns among evidence, such as bias in several assumptions or inconsistencies

among assumptions, is crucial to identifying a potential misstatement in an estimate when no

single cue definitively signals a problem. Greater elaboration should increase auditors'

consideration of how different pieces of evidence relate to one another and impact an estimate. I

therefore predict the interaction of a caveat and source credibility will affect auditors'

identification of valid potential issues in an estimate, as stated below.

> **H2:** Auditors who both receive a caveat and perceive that an initial preparer is less
> credible will identify more valid potential issues than auditors who do not receive a
> caveat or auditors who perceive that an initial preparer is more credible.

Finally, I expect auditors' judgments and decisions about an estimate overall to benefit

from the interaction of a caveat and low source credibility. Greater elaboration on the evidence

underlying a persuasive message increases the accuracy of evaluations of evidence quality and

leads to high (low) quality evidence causing more (less) acceptance of the message (Harkins and

Petty 1981; Moore and Reardon 1987). Identification of specific problems contributes to

improved auditor judgments and actions (e.g., Hoffman and Zimbelman 2009; Hammersley

2011; Hammersley et al. 2011; Griffith et al. 2013). Therefore, I expect the interactive effect of

a caveat and low source credibility to flow through to auditors' judgments about the

reasonableness of and auditors' decisions to adjust an estimate based on biased assumptions.

This also implies that elaboration on the evidence related to an estimate mediates the effect of a

caveat and low source credibility on identification of potential issues in the estimate, and

identification of potential issues mediates the effect of a caveat and low source credibility on

judgments about the estimate, as stated below.

> **H3a:** Auditors who both receive a caveat and perceive that an initial preparer is less
> credible will judge a biased estimate as less reasonable than auditors who do not receive a
> caveat or auditors who perceive that an initial preparer is more credible.

> **H3b:** Auditors who both receive a caveat and perceive that an initial preparer is less
> credible will be more likely to adjust a biased estimate than auditors who do not receive a
> caveat or auditors who perceive that an initial preparer is more credible.

H4a (mediation): Auditors' elaboration on evidence related to an estimate mediates the effect of the interaction of the presence or absence of a caveat and the initial preparer's source credibility on auditors' identification of valid potential issues in the estimate.

H4b (mediation): Auditors' identification of valid potential issues in the estimate mediates the effect of the interaction of the presence or absence of a caveat and the initial preparer's source credibility on auditors' judgments and decisions about the estimate.

IV. METHOD

To test my hypotheses, I conduct an experiment in which I manipulate the presence or absence of a caveat in the audit-team specialist's memo and I measure auditors' perceptions of the source credibility of the initial preparer of the client's estimate. I obtained 78 usable responses from experienced senior auditors from three Big 4 firms who participated while attending firm-sponsored training. These participants are appropriate because in practice senior auditors evaluate assumptions related to estimates and use audit-team specialists' work to do so (Griffith et al. 2014; Griffith 2013).[8] On average, participants have 44.1 months of experience and have worked on 1.8 audits where they used discounted cash flow models.

Task

Participants evaluate audit evidence related to an electronics manufacturer's annual goodwill impairment test. The client uses a discounted cash flow model to estimate the fair value that is compared to book value in the impairment test. The model contains five key assumptions. Participants receive a summary of the three assumptions tested by the audit team and the two assumptions tested by the audit-team specialist. The case instructs participants to review the work done by the audit team and the audit-team specialist and to draft a recommended conclusion about the client's estimate overall.

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[8] Griffith et al. (2014) document that auditors identify seniors as the most frequent primary preparers of the audit work testing assumptions related to estimates and the second-most frequent primary preparers of evaluating the overall reasonableness of estimates by considering all audit evidence. Griffith (2013) documents that 61 percent of auditors interviewed identify seniors as involved in making conclusions about estimates based on audit-team specialists' work.

I adapted the case from a firm's training materials. The case includes client background information, the client's discounted cash flow model supporting the estimate, a planning memo that identifies the five key assumptions and identifies whether the audit team or the audit-team specialist is responsible for testing each one, the audit team's work papers, and the audit-team specialist's memo. The audit team's work papers contain the results of testing three assumptions: projected revenue, operating expenses, and capital expenditures. All three assumptions fall within ranges considered reasonable by the audit team, but projected revenue and operating expenses fall toward the aggressive (i.e., estimate-increasing) ends of the ranges. The audit-team specialist's memo contains the results of testing two assumptions: discount rate and long-term growth rate. Both assumptions fall within ranges considered reasonable by the audit-team specialist, but toward the aggressive ends. Thus, four out of five assumptions used by the client are aggressive; this pattern strongly suggests misstatement in the estimate because a higher estimate increases the client's ability to pass Step 1 of the annual goodwill impairment test and avoid an impairment charge.[9] Importantly, the cumulative impact on the estimate of using less aggressive assumptions reduces the estimate to an amount less than book value that results in failing Step 1 of the goodwill impairment test.[10]

After reading the case, participants assessed the reasonableness of the estimate, decided whether they would recommend to their manager that the client adjust the estimate, listed any concerns they had about the estimate and the procedures they would do to address them, and assessed the extent of management bias in the estimate. Next, they put away the case and

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[9] An audit partner and a senior manager from two firms and with extensive experience auditing goodwill impairments reviewed the case and identified this pattern as highly indicative of a potential misstatement in the estimate due to management bias.

[10] The testing of each assumption includes a sensitivity analysis that shows the reduction in the estimate that would result from using a less aggressive assumption in place of the client's assumption. For each assumption individually, the reduction in the estimate does not change the outcome of Step 1 of the goodwill impairment test.

completed a post-experimental questionnaire that contained a surprise free recall of the

information that was important in their decisions about the estimate, the source credibility

measure, additional questions about the case, and demographic questions.

Independent Variables

For the first independent variable, I manipulate the presence or absence of a caveat in the

audit-team specialist's memo. In both the *caveat* and *no caveat* conditions, the audit-team

specialist's memo documents testing of the discount rate followed by the conclusion, "Based on

the procedures performed, we conclude that Black Bear's discount rate appears reasonable," and

then documents testing of the long-term growth rate followed by the conclusion, "Based on the

procedures performed, we conclude that Black Bear's long-term growth rate appears

reasonable." In the *caveat* condition, the audit-team specialist's memo also includes the

following caveat at the end of the memo: "We note that the discount rate and long-term growth

rate used by Black Bear both fall at the aggressive (i.e., fair value-increasing) ends of our

reasonable ranges" (emphasis in original). The memo in the *no caveat* condition excludes this

caveat.

For the second independent variable, I measure auditors' perceptions of the source

credibility of the initial preparer of the estimate. To induce variability in source credibility, I

manipulated the preparer as either an in-house or client third party preparer. The case states:

> Black Bear used an *in-house [third party]* preparer to determine its fair value of equity as of April
> 30, 2013. Black Bear's *in-house [third party]* preparer has prepared Black Bear's valuation since
> the acquisition in 2008, is a member of the National Association of Certified Valuators and
> Appraisers (NACVA), and holds an Accredited Valuation Analyst (AVA) certification from
> NACVA. Thus, during planning the audit team and the audit team's internal valuation specialist
> determined that the *in-house [third party]* preparer is well-qualified and signed off on Black
> Bear's plan to use the *in-house [third party]* preparer to prepare the valuation.

There is no consensus about which type of preparer is more credible, and auditing standards state that information from a third party can be more credible while also stating that information generated under the client's direct internal control can be more credible (Griffith 2013; PCAOB 2010d). Moreover, auditors' beliefs about in-house and third party preparers are based on their idiosyncratic experiences. Clients typically hire third parties because they lack the expertise to prepare estimates themselves (Dichev et al. 2013), so some auditors feel more comfortable when clients use third parties (Griffith et al. 2014; Griffith 2013). Other auditors perceive in-house preparers as highly credible because only very sophisticated clients prepare their own estimates (Griffith 2013). Thus, I measure source credibility after inducing variability because my theory focuses on the effects of source credibility rather than the determinants of it. Participants assess the expertise and objectivity of the preparer of the client's estimate; I sum these two scores for the source credibility measure.[11] Mean (median) source credibility across participants is 11.4 (12). I split participants at the median into *low* and *high* source credibility conditions. The mean (standard deviation) of 8.6 (1.96) in the *low* condition is significantly lower than the mean (standard deviation) of 14.1 (1.75) in the *high* condition ($t_{75} = 12.94$, one-tailed $p < 0.001$).[12]

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[11] After completing the case and putting away the case materials, participants responded on 11-point Likert scales to the questions "How much technical expertise does the preparer of the client's valuation have?" and "How objective is the preparer of the client's valuation?" anchored by 0 (very low expertise; not at all objective) and 10 (very high expertise; extremely objective).

[12] Using a measured independent variable raises two possible concerns. First, a correlated omitted variable such as experience could drive the source credibility ratings. However, none of the general or task-specific experience or knowledge measures are correlated with source credibility ratings (all two-tailed $p > 0.35$), inconsistent with a correlated omitted variable. Second, task performance could drive the source credibility ratings because participants rate source credibility after completing the case. This implies that participants in the low credibility condition may have self-selected there based on caveat condition, which would result in unequal cell sizes. However, the distribution of participants across cells does not differ from the expected distribution ($\chi^2_1 = 1.04$, two-tailed $p = 0.307$), inconsistent with self-selection. If task performance were driving source credibility ratings, this also implies that source credibility ratings in the caveat condition would be significantly lower than in the no caveat condition. Mean source credibility ratings across the caveat (11.14) and no caveat (11.63) conditions do not significantly differ ($t_{75} = 0.65$, two-tailed $p = 0.517$). In total, these analyses are inconsistent with alternative explanations for the source credibility ratings and suggest that diversity of opinion about in-house and third party preparers causes the variance in source credibility ratings.

Dependent Variables

Hypothesis 1: Measure of Elaboration

The first hypothesis tests auditors' elaboration on the evidence related to the estimate. After completing the case and putting it away, participants completed a surprise free recall in which they listed the information from the case that was important to their decisions about the client's estimate. A doctoral student with auditing experience and I independently coded each item listed as (1) recalling information given in the case, (2) combining given information with other knowledge to make an inference, or (3) other (e.g., factually incorrect items). Inter-rater agreement was 91 percent and Cohen's kappa was 0.87 ($p < 0.001$).[13] The total number of items coded into the second category measures participants' elaboration on the evidence, because elaboration involves relating evidence underlying a message to relevant knowledge and making inferences about the evidence and the message based on that scrutiny (Petty and Cacioppo 1986).

Hypothesis 2: Measures of Identification of Valid Concerns

The second hypothesis tests auditors' identification of potential issues in the biased estimate. After reading the case but before putting it away, participants listed their concerns about the estimate, if any, and the procedures they would perform to address them before concluding on the estimate. A doctoral student with auditing experience and I coded each item, comprised of a concern and the related procedures, as concerned about (1) management bias, (2) insufficient support for the client's assumptions, or (3) other (e.g., the mathematical accuracy of the client's discounted cash flow model). Inter-rater agreement was 84 percent and Cohen's kappa was 0.56 ($p < 0.001$). Items in the first category explicitly mention bias in the assumptions and/or suggest performing more conservative sensitivity analyses to evaluate the

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[13] We coded all of the data for this study while blind to experimental condition. Coders met to resolve differences and I report those data here.

impact on the estimate of using less aggressive assumptions. Items in the second category indicate concern that the nature of the evidence obtained does not adequately support the estimate. Examples include wanting external evidence to support the client's projected increase in revenue based on a planned new product launch, better documentation of how the audit team or audit-team specialist determined reasonable ranges for the assumptions, and evaluation of management's forecasting ability in light of historical inaccuracy. Following up on concerns in the first two categories can lead to identifying and quantifying possible misstatements in the estimate indicated by inconsistencies or patterns among assumptions, while following up on concerns in the third category would not. The total number of items coded into the first two categories measures participants' identification of valid concerns about the estimate.

I also collect participants' ratings of the extent of management bias in the estimate for a secondary test of H2. Participants rated the extent of management bias in the estimate on an 11-point Likert scale anchored by 0, "not at all biased," and 10, "extremely biased."

Hypothesis 3: Measures of Auditor Judgments and Decisions

The third hypothesis tests auditors' judgments and decisions about the estimate overall. To test H3a, I measure auditors' assessments of the reasonableness of the estimate. Participants responded to the question, "How likely is it that Black Bear's fair value is fairly stated?" on an 11-point Likert scale anchored by 0, "not likely at all," and 10, "extremely likely."

To test H3b, I measure participants' recommendations that the client adjust the estimate. Participants responded yes or no to the question, "Would you recommend to your manager that Black Bear adjust its fair value?" after assessing the reasonableness of the estimate.

V. RESULTS

Preliminary Analyses

I use two attention checks to determine whether participants attended to the case. The first attention check gauges attention to the caveat manipulation by asking participants what the audit team specialist documented in their memo.[14] The second attention check gauges attention to the preparer manipulation by asking participants who prepared the client's estimate.[15] I exclude participants who fail either attention check from subsequent analyses.

I evaluate potential effects of firm and experimental session by examining the correlations between participants' firm and each dependent variable, and between experimental session and each dependent variable. The only dependent variable correlated with either factor is rated extent of bias. However, when I include firm and experimental session as covariates (as main effects and all possible interaction combinations) in a model testing extent of bias, neither factor loaded as a significant covariate, alone or interactively with other variables. Therefore, I do not control for firm or experimental session in subsequent analyses.

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[14] Two questions comprise this attention check. The first asks participants what the audit-team specialist's memo said about the discount rate, and the second asks what the memo said about the long-term growth rate. Each question offers the following five options and prompts participants to check all that apply: the rate was reasonable; the rate was unreasonable; the rate was at the conservative end of the range; the rate was at the aggressive end of the range; and I don't remember. I retain participants who provide at least partial evidence of attention to the caveat manipulation (e.g., by checking reasonable at least once in the no caveat condition, and by checking aggressive at least once in the caveat condition). I exclude participants who show no evidence of attending to the caveat manipulation (e.g., by checking factually incorrect responses or "I don't remember"). Based on these criteria, I exclude 12 of the 105 initial participants from the remaining analyses, noting that two of these participants also failed the preparer attention check. Statistical inferences do not change when I include participants who showed no evidence of attending to the caveat in the analyses.

[15] Participants chose one of three options: an in-house preparer, an external third party, or "I don't remember." Although I use a measured variable to create low and high source credibility conditions, I use this attention check question to screen for participants who paid very little attention to the source of the client's estimate. The construct of source credibility is unlikely to be activated in those participants who did not attend enough to the case to answer the question about the preparer correctly, so excluding these participants allows a stronger test of my theory. Based on these criteria, I exclude 17 of the initial 105 participants from the remaining analyses for failing to attend to the case information about the client's preparer. Statistical inferences do not change when I include participants who incorrectly identified the preparer in the analyses.

Test of Hypothesis 1: Elaboration

H1 predicts that low source credibility and a caveat will interact to increase auditors' elaboration on the evidence related to an estimate relative to auditors in other conditions. Table 1 reports a generalized linear model with caveat and source credibility as independent variables, and elaboration as the dependent variable. [16] Across all conditions, participants recalled from 0 to 6 items that included elaboration, with a mean (standard deviation) of 0.96 (1.31). Given this distribution, I use a Poisson regression to test H1. [17]

The planned contrast in Panel C shows that, as predicted, auditors in the caveat/low credibility condition elaborate more than auditors in other conditions (one-tailed $p < 0.001$). [18] A test of the residual between-cells variation (not tabulated) indicates the hypothesized contrast explains the data well ($F_{2, 71} = 0.001$, two-tailed $p = 0.999$). [19] The mean of 1.65 items in the caveat/low credibility condition is significantly higher than the 0.88 items in the no caveat/low credibility (one-tailed $p = 0.012$), 0.73 items in the no caveat/high credibility (one-tailed $p = 0.003$), and 0.63 items in the caveat/high credibility conditions (one-tailed $p = 0.002$). These results support H1. Auditors who both receive a caveat and perceive the initial preparer to be less credible elaborate significantly more on the evidence than auditors in other conditions.

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[16] For each dependent variable, I evaluated whether task-specific experience and knowledge measures that are significantly correlated with the dependent variable are significant in the model testing the hypothesis. I include these measures as covariates when they are significant in the models testing the hypotheses.

[17] The independent variables are significant predictors of the dependent variable ($\chi^2_3 = 11.60$, $p = 0.009$); however, model fit statistics indicate the data are over-dispersed ($\chi^2_{71} = 116.04$, $p < 0.01$; deviance = 1.65) relative to the expected Poisson distribution. I re-estimated the model using a negative binomial distribution; while model fit improves ($\chi^2_{71} = 60.13$, $p > 0.10$; deviance = 0.95), statistical inferences are not affected, so I retain the analysis based on the Poisson distribution.

[18] I report one-tailed p-values for predicted directional contrasts and two-tailed p-values for other tests.

[19] The semi-omnibus F statistic tests the significance of the variation caused by the independent variables that is not explained by the hypothesized contrast; a p-value greater than 0.05 indicates that the remaining variation is insignificant (Keppel and Wickens 2004). I compute the semi-omnibus F test using the sums of squares from an ANOVA model (not reported) testing the dependent variable. Statistical inferences for the planned contrasts do not change based on the ANOVA model, but I report the results of the generalized linear model for the primary test of the hypothesis because it is a more precise and therefore more powerful model given the Poisson distribution of the dependent variable.

[Insert Table 1 here]

Tests of Hypothesis 2: Identification of Valid Concerns

H2 predicts that low source credibility and a caveat will interact to increase auditors'
identification of valid concerns about the estimate relative to auditors in other conditions. Table
2 reports a generalized linear model with caveat and source credibility as independent variables,
auditors' self-reported comfort auditing Step 1 of a goodwill impairment test as a covariate, and
identification of valid concerns as the dependent variable. Across all conditions, participants
listed from 0 to 9 valid concerns, with a mean (standard deviation) of 2.56 (1.80). Given this
distribution, I use a Poisson regression to test H2.[20]

The planned contrast in Panel C shows that, as predicted, auditors in the caveat/low
credibility condition identify more valid concerns than auditors in other conditions (one-tailed p
= 0.007). A test of the residual between-cells variation (not tabulated) indicates the hypothesized
contrast explains the data well ($F_{2, 72} = 2.488$, two-tailed p = 0.090).[21] The mean of 3.28 valid
concerns in the caveat/low credibility condition is significantly greater than the means of 2.40 in
the no caveat/high credibility and 1.62 in the caveat/high credibility conditions (one-tailed p =
0.042 and < 0.001, respectively), but not the mean of 2.86 in the no caveat/low credibility
condition (one-tailed p = 0.211). This evidence partially supports H2, but the result is driven by
the source credibility condition.

[Insert Table 2 here]

As a secondary test of H2, I examine auditors' ratings of the extent of management bias
in the estimate. Table 3 reports an ANCOVA with caveat and source credibility as independent
variables, the number of discounted cash flow models that participants have audited as a

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[20] The independent variables are significant predictors of the dependent variable ($\chi^2_4 = 16.39$, p = 0.003), and model
fit is good ($\chi^2_{72} = 82.30$, p > 0.10; deviance = 1.15).
[21] See footnote 19.

covariate, and auditors' bias ratings as the dependent variable. The planned contrast in Panel C

is not significant (one-tailed p = 0.276), and none of the partial contrasts between the caveat/low

credibility and other conditions are significant (all one-tailed p > 0.26). Interestingly, auditors in

the caveat/low credibility condition do not perceive significantly more bias in the estimate than

auditors in the other conditions, although all were aware of bias in the estimate given the

relatively high ratings in all conditions. Overall, this suggests that recognition of bias may be

necessary, but is not sufficient, for identification of valid concerns when assumptions appear

reasonable individually but a pattern among them indicates a potential issue. Overall, these

results partially support H2 with respect to identification of valid concerns about the estimate.

[Insert Table 3 here]

Tests of Hypothesis 3: Judgments and Decisions

H3 predicts that the effect of a caveat and source credibility will flow through to auditors'

judgments about the reasonableness of the estimate and decisions about recommending that the

client adjust it. Table 4 reports an ANOVA with caveat and source credibility as independent

variables, and auditors' ratings of how likely the estimate is to be reasonably stated as a

dependent variable. The planned contrast in Panel C shows that, as predicted, auditors rate the

estimate as less likely to be reasonably stated in the caveat/low credibility condition than in other

conditions (one-tailed p < 0.001). A test of the residual between-cells variation (not tabulated)

indicates the hypothesized contrast explains the data well ($F_{2, 73}$ = 2.864, two-tailed p = 0.064).

The mean rating of reasonableness of 4.55 in the caveat/low credibility condition is significantly

lower than the means of 5.53 in the no caveat/low credibility (one-tailed p = 0.051), 6.12 in the

no caveat/high credibility (one-tailed p = 0.003), and 7.00 in the caveat/high credibility

conditions (one-tailed p < 0.001). Thus, auditors' ratings of reasonableness support H3.

[Insert Table 4 here]

Table 5 reports a logistic model with caveat and source credibility as independent variables, and auditors' adjustment recommendation as a binary dependent variable. The planned contrast in Panel C shows that, as predicted, auditors are more likely to recommend adjusting the estimate in the caveat/low credibility condition than in other conditions (one-tailed p = 0.006). A test of the residual between-cells variation (not tabulated) indicates the hypothesized contrast explains the data well ($F_{2,\,72}$ = 1.365, two-tailed p = 0.262).[22] The proportion of 55 percent of auditors recommending adjustment in the caveat/low credibility condition is significantly greater than the 22 percent in the no caveat/high credibility (one-tailed p = 0.014) and 13 percent in the caveat/high credibility conditions (one-tailed p = 0.005), but not the 39 percent in the no caveat/low credibility condition (one-tailed p = 0.161). Thus, auditors' adjustment recommendations partially support H3, but the result is driven by the source credibility condition. Overall, these results support H3, indicating that auditors' judgments and decisions about the estimate reflect more concern when they receive a caveat and perceive clients as less credible than in other conditions.

[Insert Table 5 here]

Mediation Analyses

H4a predicts that elaboration mediates the relationship from caveat and source credibility to identification of valid concerns.[23] H4b predicts that identification of valid concerns mediates

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[22] I compute the semi-omnibus F test using the sums of squares from an ANOVA model (not reported) testing the dependent variable. Statistical inferences for the planned contrasts do not change based on the ANOVA model, but I report the results of the logistic model for the primary test of the hypothesis because it is a more precise and therefore more powerful model given the binary dependent variable.

[23] As evidence of mediation, four conditions must be met (Baron and Kenny 1986). First, the dependent variable of interest must be related to the independent variable of interest. Second, the expected mediator must be related to the independent variable. Third, the expected mediator must be correlated with the dependent variable. Fourth, when the mediator is included with the original independent variable in a model testing the dependent variable, the

25

the relationship from caveat and source credibility to rating of reasonableness and adjustment recommendation. The preceding tests of H1, H2, and H3 show that the independent variables affect the expected mediators, and that the independent variables affect the dependent variables, satisfying the first and second mediation requirements for H4a and H4b. For H4a, the expected mediator, elaboration, is significantly correlated with identification of valid concerns (two-tailed $p = 0.072$). For H4b, the expected mediating variable, identification of valid concerns, is significantly correlated with rating of reasonableness (two-tailed $p = 0.010$) but not with adjustment recommendation (two-tailed $p = 0.141$). Therefore, the third mediation requirement is satisfied for identification of valid concerns in H4a and for rating of reasonableness in H4b.

I next compare the results of testing the dependent variable (i.e., identification of valid concerns for H4a, and rating of reasonableness for H4b) from the model including the mediator to the results from the model excluding the mediator. When the model testing identification of valid concerns as a dependent variable includes elaboration as a mediator (H4a), the significance of the planned contrast decreases (one-tailed $p = 0.028$ with mediator, versus $p = 0.007$ without mediator), indicating elaboration partially mediates identification of valid concerns. When the model testing rating of reasonableness as a dependent variable includes identification of valid concerns as a mediator (H4b), the significance of the planned contrast decreases (one-tailed $p = 0.002$ with mediator, versus $p < 0.001$ without mediator), indicating identification of valid concerns partially mediates rating of reasonableness.

In sum, the mediation analyses suggest that elaboration influences identification of valid concerns, and identification of valid concerns influences auditors' ratings of how likely an estimate is to be reasonably stated, supporting my theory. Thus, H4 is supported with respect to

significance of the original independent variable must decrease as compared to the results of the model excluding the mediator.

the mediating role of elaboration in auditors' identification of valid concerns and identification of valid concerns in auditors' ratings of how likely the estimate is to be reasonably stated.

VI. DISCUSSION AND CONCLUSION

Auditors struggle to integrate the results of testing the assumptions underlying estimates, which can lead to lower quality audits of estimates. In this study, I experimentally examine the joint effect of audit-team specialists' caveats and auditors' perceptions of source credibility on auditors' evaluation of estimates. Auditors reviewed the evidence obtained by the audit team and the audit-team specialist to test the key assumptions in a client's estimate and made judgments about its reasonableness and whether they would recommend adjusting it.

I predict and find that auditors who both receive a caveat and perceive lower source credibility elaborate more on the evidence, identify more valid concerns about the estimate, judge a biased estimate as less reasonable, and are more likely to recommend adjusting a biased estimate than auditors who do not receive a caveat or who perceive higher source credibility. Importantly, auditors benefit more from audit-team specialists' caveats when they perceive lower source credibility; those who perceive higher source credibility discount the caveat. Auditors' elaboration on the evidence partially mediates the effect of a caveat and source credibility on auditors' identification of valid concerns. Auditors' identification of valid concerns partially mediates the effect of caveat and source credibility on auditors' judgments about the reasonableness of the estimate. These results suggest that the combination of a caveat and low perceived source credibility causes auditors to elaborate on the evidence related to an estimate in a way that improves their judgments.

Interestingly, auditors who do not receive a caveat or perceive higher source credibility do not rate the estimate as less biased than auditors who both receive a caveat and perceive lower

27

source credibility. However, auditors who do not receive a caveat or perceive higher source credibility are less likely to respond to the extent of bias that they perceive, as evidenced by significantly lower identification of valid concerns, higher assessed reasonableness of the estimate, and fewer adjustment recommendations. This suggests that recognition of bias may be necessary, but is not sufficient for identifying and acting on issues in estimates indicated by patterns among assumptions that appear reasonable individually.

This study makes several contributions. First, this study helps researchers, standard setters, and practitioners understand the conditions under which auditors benefit from caveats. I find that a caveat helps auditors evaluate estimates when they perceive the initial preparer of an estimate to be less credible, but not when they perceive the preparer to be more credible. The caveat provides interpretation of the audit-team specialist's results that helps auditors understand how to relate those results to the results of testing other assumptions and to the estimate overall. Yet, when auditors perceive higher source credibility the caveat does not increase auditors' elaboration on the evidence or improve auditors' performance in terms of identifying valid concerns, judging the estimate as less reasonable, or increasing the chance that auditors recommend adjusting the estimate. Thus, caveats appear to be more beneficial in combination with another signal that increases auditors' concern about an estimate. Future research can explore what type of cue to combine with a caveat for greater benefit and whether it is more beneficial for audit-team specialists or auditors themselves to combine a caveat with another cue.

Second, this study shows that increasing auditors' elaboration on the evidence related to estimates can improve audits of estimates when the assumptions collectively suggest an issue but do not appear problematic individually. This study suggests that caveats are one tool that can

help auditors elaborate; future research can explore other factors and interventions that increase auditors' elaboration on the evidence related to estimates.

Third, this study contributes theoretically to research on source credibility. Prior auditing research documents that auditors rely more heavily on evidence from more credible sources but does not examine the process by which higher source credibility causes greater reliance (Hirst 1994; Anderson et al. 2004). This study suggests that low elaboration is the mechanism through which auditors' greater reliance occurs and this is prompted by higher source credibility. This refines our understanding of *how* higher source credibility leads to greater reliance on information from more credible sources.

Finally, psychology research on the determinants of elaboration characterizes source credibility as a peripheral cue to be processed once some other factor determines the extent of elaboration. This study suggests that source credibility can also be an important determinant of elaboration. This study also identifies client source credibility as a heuristic that auditors rely on in place of critically evaluating information (i.e., the evidence related to the assumptions) that can identify specific issues when performing a difficult, subjective task like evaluating the assumptions underlying an estimate. In conclusion, this study provides initial evidence about caveats, a potentially useful tool to improve audits of estimates, and how they interact with perceived client source credibility, an important contextual feature in auditing estimates, that future research can build on to ultimately improve audits of estimates.

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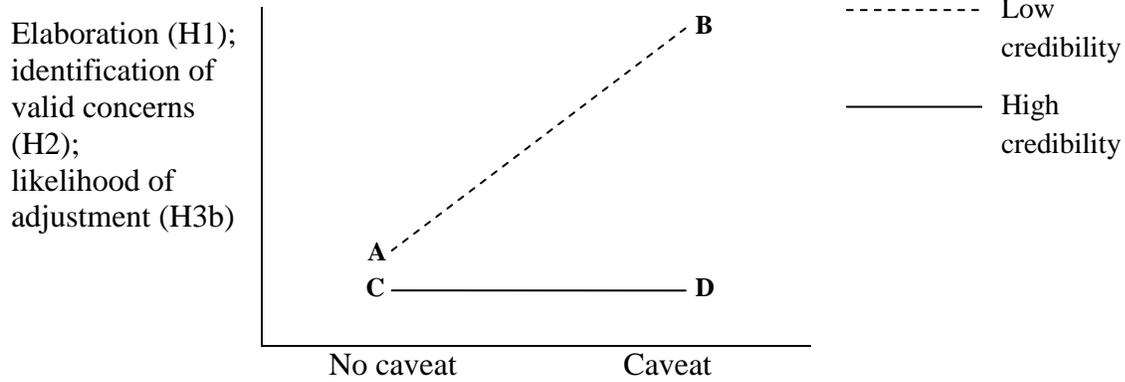
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FIGURE 1
Illustration of Hypotheses

Panel A: H1, H2, H3b

Elaboration (H1);
identification of
valid concerns
(H2);
likelihood of
adjustment (H3b)

B

---------- Low
credibility

——————— High
credibility

A

C ————————————— D

No caveat   Caveat
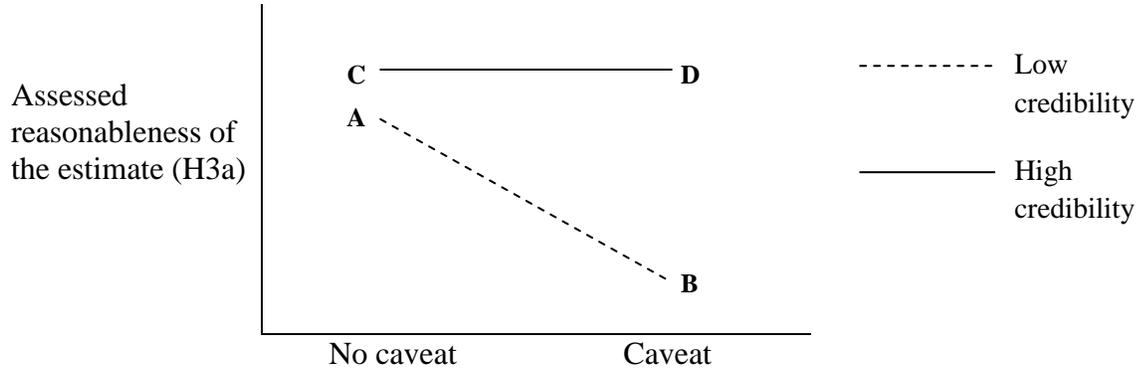
Note on Panel A:
The figure above illustrates the prediction for H1, H2, and H3b: $B > (A + C + D) / 3$.

Panel B: H3a

Assessed
reasonableness of
the estimate (H3a)

C ————————————— D

A

B

---------- Low
credibility

——————— High
credibility

No caveat   Caveat

Note on Panel B:
The figure above illustrates the prediction for H3a: $B < (A + C + D) / 3$.

TABLE 1
Hypothesis 1: Auditors' Elaboration on Evidence[a]

Panel A: Generalized Linear Model (Log Link, Poisson Distribution)

Source of Variation	df	Wald Chi-square	2-tailed p-value
Caveat	1	0.86	0.354
Source credibility	1	5.39	0.020
Caveat * Source credibility	1	2.40	0.121

Panel B: Cell means for Elaboration Mean (SE) [N] Cell

	No caveat	Caveat	
Low credibility	0.88 (.256) [17] A	1.65 (.379) [20] B	1.30 (.242) [37]
High credibility	0.73 (.273) [22] C	0.63 (.202) [16] D	0.68 (.177) [38]
	0.79 (.188) [39]	1.19 (.241) [36]	

Panel C: Test of H1

Planned Contrast	Chi-square	1-tailed p-value
B > (A + C + D) / 3	11.10	< 0.001

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[a] Caveat is manipulated at two levels: no caveat and caveat. Source Credibility is measured as the sum of responses on two 11-point Likert scales that ask participants to rate two dimensions of the source credibility of the preparer of the client's estimate: the expertise and objectivity of the preparer. Each scale is anchored by 0, very low, and 10, very high, so a higher sum indicates higher perceived source credibility. Participants are split on the median into two levels of source credibility: low and high. Elaboration is the number of items listed in a surprise free recall after participants put away the case materials that were coded as elaborating on the case information by combining the given information with other relevant knowledge.

TABLE 2
Hypothesis 2: Auditors' Identification of Valid Concerns in the Estimate[a]

Panel A: Generalized Linear Model (Log Link, Poisson Distribution)

Source of Variation	df	Wald Chi-square	2-tailed p-value
Caveat	1	0.58	0.447
Source credibility	1	8.57	0.003
Caveat * Source credibility	1	3.04	0.081
Comfort auditing Step 1 of a goodwill impairment test	1	5.96	0.015

Panel B: Cell means for Valid Concerns Adjusted Mean (SE) [N] Cell

	No caveat	Caveat	
Low credibility	2.86 (.402) [18] A	3.28 (.380) [20] B	3.07 (.276) [38]
High credibility	2.40 (.356) [23] C	1.62 (.426) [16] D	2.01 (.276) [39]
	2.63 (.267) [41]	2.45 (.285) [36]	

Panel C: Test of H2

Planned Contrast	Chi-square	1-tailed p-value
B > (A + C + D) / 3	6.08	0.007

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[a] See definitions of Caveat and Source Credibility in Table 1. Valid Concerns is the number of items coded as identifying valid concerns about bias or insufficient support for the client's assumptions that were listed when asked what concerns participants had, if any, about the estimate.

TABLE 3
Hypothesis 2: Auditors' Ratings of the Extent of Management Bias in the Estimate[a]

Panel A: Two-Way ANCOVA

Source of Variation	df	MS	F	2-tailed p-value
Caveat	1	0.04	0.01	0.927
Source credibility	1	2.14	0.44	0.509
Caveat * Source credibility	1	0.33	0.07	0.797
Number of audits of discounted cash flow models	1	23.19	4.77	0.032
Error	71	4.86		

Panel B: Cell Means for Extent of Management Bias Adjusted Mean (SE) [N] Cell

	No caveat	Caveat	
Low credibility	5.91 (.520) [18] A	6.09 (.494) [20] B	6.00 (.359) [38]
High credibility	5.71 (.471) [22] C	5.62 (.551) [16] D	5.66 (.363) [38]
	5.81 (.351) [40]	5.86 (.370) [36]	

Panel C: Test of H2

Planned Contrast	$F_{1, 71}$	1-tailed p-value
B > (A + C + D) / 3	0.36	0.276

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[a] See definitions of Caveat and Source Credibility in Table 1. Extent of Management Bias is the response to the prompt, "Rate the extent of management bias in the client's fair value," on an 11-point Likert scale anchored by 0, not at all biased, and 10, extremely biased.

TABLE 4
Hypothesis 3: Auditors' Ratings of Likelihood of Reasonableness[a]

Panel A: Two-Way ANOVA

Source of Variation	df	MS	F	2-tailed p-value
Caveat	1	0.05	0.02	0.901
Source credibility	1	43.64	13.08	0.001
Caveat * Source credibility	1	16.38	4.91	0.030
Error	73	3.34		

Panel B: Cell Means for Likelihood of Reasonableness Mean (SE) [N] Cell

	No caveat	Caveat	
Low credibility	5.53 (.463) [18] A	4.55 (.394) [20] B	5.02 (.308) [38]
High credibility	6.12 (.405) [23] C	7.00 (.387) [16] D	6.48 (.292) [39]
	5.86 (.305) [41]	5.64 (.343) [36]	

Panel C: Test of H3

Planned Contrast	$F_{1, 73}$	1-tailed p-value
B < (A + C + D) / 3	12.28	< 0.001

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[a] See definitions of Caveat and Source Credibility in Table 1. Likelihood of Reasonableness is the response to the question, "How likely is it that the client's fair value is fairly stated?" on 11-point Likert scale anchored by 0, not at all likely, and 10, extremely likely.

TABLE 5
Hypothesis 3: Auditors' Adjustment Recommendations[a]

Panel A: Generalized Linear Model (Logit Link, Binomial Distribution)

Source of Variation	df	Wald Chi-square	2-tailed p-value
Caveat	1	0.00	0.956
Source credibility	1	6.64	0.010
Caveat * Source credibility	1	1.22	0.270

Panel B: Cell Means for Adjustment Recommendation Mean (SE) [N] Cell

	No caveat	Caveat	
Low credibility	.39 (.502) [18] A	.55 (.510) [20] B	.47 (.506) [38]
High credibility	.22 (.422) [23] C	.13 (.352) [15] D	.18 (.393) [38]
	.29 (.461) [41]	.37 (.490) [35]	

Panel C: Test of H3

Planned Contrast	Chi-square	1-tailed p-value
B > (A + C + D) / 3	6.30	0.006

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[a] See definitions of Caveat and Source Credibility in Table 1. Adjustment Recommendation is the proportion of auditors who responded "yes" to the question, "Would you recommend to your manager that the client adjust its fair value?"