Triangulation of audit evidence in fraud risk assessments

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Abstract

Drawing on the triangulation framework of audit evidence (Bell, Peecher, & Solomon, 2005; Peecher, Schwartz, & Solomon, 2007), we experimentally test for the conditions, if any, under which financial-statement auditors alter their fraud-risk assessments based on whether external evidence provides positive or negative news about underlying business performance. We focus on the condition in which two kinds of management-controlled audit evidence – evidence from the financial statements and evidence from internal data depicting performance of a key business process – is contradicted by external evidence suggesting that a key business objective has not been attained. According to the triangulation framework, such contradictory external evidence should heighten auditors’ skepticism about the veracity of management-controlled evidence and increase their assessment of fraud risk.

The experimental findings indicate that auditors’ assessments of fraud risk significantly depend on whether or not external evidence disconfirms the attainment of a key business objective, but only when conflicting messages are provided by the two kinds of internal evidence. Importantly, auditors did not rely on external evidence when, in isolation, the two kinds of management-controlled internal evidence both suggested low fraud risk. Auditors’ failure to use external evidence as a means of ensuring the veracity of management-controlled internal evidence is more consistent with a credulous than with a skeptical mindset.

Introduction

Recent regulation both in the USA (SAS 99; AICPA, 2002; PCAOB, 2007) and internationally (ISA 240) has placed increased responsibility on auditors for the detection of financial statement fraud. The Public Company Accounting Oversight Board (PCAOB) has reminded auditors of the importance of being diligently focused on their responsibilities to detect fraud (PCAOB, 2007, 2008). However, fraud can be difficult to detect as “some members of management may even seek to conceal outright fraud by strategically altering information they expect the auditor will obtain as evidence” (Bell, Peecher, & Solomon, 2005, p. 19).

This changed regulatory environment, as well as society’s demand for greater protection, implies increasing minimum evidence requirements and increased responsibilities for auditors in relation to fraud detection (Peecher, Schwartz, & Solomon, 2007). This focuses interest on how auditors respond to different types of evidence when making fraud related judgments. With the aim of meeting society’s expectations with respect to financial statement fraud, new evidence frameworks have been developed. In

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Bell et al. (2005) the concept of evidentiary triangulation is positioned as a conceptually normative way for auditors to acquire and evaluate complementary sources of evidence and to rely on that evidence in updating their risk assessments. As part of triangulation, the auditor can obtain evidence from the management-controlled financial statement process, management-controlled evidence depicting performance in key business processes (e.g., internal controls, production and marketing reports) or external evidence on whether a key business objective has been attained (e.g., information from customers or other external parties). Use of this external evidence is of particular interest because it is not easily manipulated by management compared with other sources of evidence that are subject to different degrees of management influence (Peecher et al., 2007).

Understanding the use of evidentiary triangulation (hereafter referred to as ‘triangulation’) by auditors is important given the view that “triangulation enables audit quality improvement” particularly in situations where the auditor is concerned about intentional misstatement (Bell et al., 2005, p. 29). Specifically, Peecher et al. (2007) note that while the triangulation framework provides considerable promise for improving auditor fraud detection capabilities, there is a need for research that demonstrates more precisely the conditions under which external evidence, providing information about underlying business performance, can better detect material misstatements that stem from management fraud (Peecher et al., 2007). It is this question that we address.

In the context of an accounting fraud, we test hypotheses for auditors’ use of external evidence depicting performance of a key business process. Management has implemented an accounting fraud involving overstated client revenue and profitability using one of two types of strategies to conceal the fraud (‘concealment strategies’). The two concealment strategies produce financial results that have different levels of compatibility with the client’s strategic business objectives and results of operations during the period. In all treatments, the controller provided the same fraudulent explanation for the higher-than-expected revenue number. In order to assess fraud risks at the planning stage of an audit, senior auditors were given the unaudited financial statement numbers (under the two different concealment strategies), business process performance evidence, and external evidence on levels of achieved customer satisfaction for increased sales. Given both consistent and inconsistent fraud risk implications for profiles of the financial statement and internal business process performance evidence, we examine the impact on fraud risk assessments of external evidence on the performance of a key business objective.

There are three major contributions of this research. First, in an environment where there is increased emphasis on fraud detection, there is a need to rethink the types of evidence used (Hammersley, 2011; Hoffman & Zimbelman, 2009; Peecher et al., 2007). Here we examine fraud risk assessments of auditors when they simultaneously use different sources of evidence that are subject to different degrees of management influence. While some forms of evidence can be manipulated by management, other evidence is generally more difficult to manipulate as it comes from outside the organization.

Second, as suggested by Peecher et al. (2007), there is a need for research that addresses the conditions under which auditors are more versus less likely to engage in triangulation. Importantly, we find that external evidence, related to key business objectives, impacts fraud assessments when the implications of two types of management-controlled evidence are inconsistent. However, given the ability of management to manipulate this evidence, external evidence related to business objectives should also be useful to detect fraud in situations where the two types of evidence controlled by management both consistently suggest a low likelihood of fraud. This was not the case in our study even though it is this very situation where external evidence should be of most benefit in detecting fraud.

Third, we report results on the ability of auditors to use evidence on the performance of the client’s business model to assess the risk of a (seeded) accounting fraud. We manipulate the financial statements such that there is either relatively high or low compatibility of the asserted financial statement numbers with the design and performance of the client’s business model. While a lack of compatibility does not necessarily indicate a misstatement, it should result in auditors refining their misstatement and non-misstatement expectations (Peecher et al., 2007). We find that auditors can use evidence on the performance of the client’s business model, and its compatibility with the financial statements, to interpret appropriately the fraud risk implications.

Previous research and hypotheses development

Our study forms part of the stream of literature on risk-based auditing (e.g., Bell, Marrs, Solomon, & Thomas, 1997; Knechel, 2007; Schultz, Bierstaker, & O’Donnell, 2010). Previous research has considered the impact of different types and sources of audit evidence (e.g., Cohen, Krishnamoorthy, & Wright, 2000; Hirst, 1994; Phillips, 1999) but not business model evidence. We recognize that an auditor’s expectations, and the acquisition and use of evidence, depend on a rich understanding of how management executes its business model (e.g., Knechel, 2007; Kopp &

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2 The term triangulation originated in surveying and navigation literatures where those skeptical of the validity of measured distances used the laws of trigonometry to assess that individual measures cross checked (Bell et al., 2005, fn. 49). Currently the term triangulation is most commonly used by social scientists. If different research methods (e.g., archival, experimental and interview data) all point to the same conclusion, there is greater support for the theory being tested. The strength of the triangulation depends on the independence of the methods used (Harvey, MacDonald, & Hill, 2000; Yin, 1994). A similar but slightly broader use of the term ‘triangulation’ is used in the public health literature where triangulation is defined as “the synthesis and integrated analysis of data from multiple sources” (Global Health Sciences, 2010). The term ‘evidentiary triangulation’ used by Bell et al. (2005) similarly synthesizes evidence from multiple sources.

3 Overstating revenue is a very common method of fraud with studies showing between 38% and 50% of frauds involving overstating revenues either by reporting revenues prematurely or by creating fictitious revenue transactions (see review by Hogan, Zabihollah, Riley, & Velury, 2008).
O'Donnell, 2005; Peecher et al., 2007; Schultz, Bierstaker, & O'Donnell, 2010). For example, Peecher et al. (2007) in their description of one form of risk-based auditing, namely strategic systems auditing (SSA), note that the auditor acquires a rich understanding of how and how well management is carrying out its business model in order to develop expectations of future financial statement amounts.

To extend the Bell et al. (2005) framework, Peecher et al. (2007) describe a model where financial statements contain management business representations and management asserts that these representations fairly depict entity business states (EBS). The ideas of triangulation provide one way to model the financial reporting process (Bell et al., 2005; Peecher et al., 2007) and such a model is set out in Fig. 1. These management business representations (MBR) occur within accounting journals, ledgers, financial statements, MDA and press releases (Peecher et al., 2007). The role of the financial statement auditor is to provide assurance on the extent to which the financial statement representations fairly depict the state of the business entity as is shown under EBS in Fig. 1. These EBS are all business strategies and processes, as well as economic actions and events, together with past, present and future transactions with other entities such as suppliers, customers, competitors, alliance partners, capital markets and regulators.

As seen in Fig. 1, the link between MBR and EBS is via management information intermediaries (MII). These MII can have both a financial emphasis (e.g., internal controls over financial reporting, financial accounting standards and supporting personnel such as bookkeepers, and internal auditors) and a non-financial emphasis (e.g., systems and processes to help make key strategic, operating and business decisions related to sales, production, research and development, etc.) (Bell et al., 2005; Budescu, Peecher, & Solomon, 2011). These MIIs gather information, measure and transform EBS into a variety of MBR as is indicated on the right-hand side of Fig. 1.

Bell et al. (2005) use the term triangulation to describe the gathering of all three sources of evidence: EBS, MII and MBR. They suggest that each of these three fundamental sources of evidence possess unique strengths and weaknesses and that the gathering of mutually reinforcing evidence from all three sources is important for formulating and revising auditors’ subsequent risk assessments (p. 27). They further recognize (p. 5) that when financial statement fraud is present, EBS evidence is distinctive in that it is more difficult to distort compared to MBR and MII evidence, which is more under management’s control. Consequently, in this study we examine the impact of EBS evidence in situations where MBR and MII evidence jointly provide consistent or inconsistent implications for the likeliness of fraud in order to test particular propositions based on the Bell et al. (2005) model which emphasizes the importance of EBS evidence in these circumstances.

The above normative model outlines how auditors ought to use different types of evidence (EBS, MII and MBR). In this model, “the dynamics of EBS must be a core focus for the auditor” (Power, 2007). However, there have been a range of conjectures on whether the use of EBS evidence is in accord with triangulation as described in Bell et al. (2005) and Peecher et al. (2007). For example, Power (2007) notes that “a different type of expertise will be needed here” and that a new approach to auditing involves assumptions about the level of expertise of auditors (Knechel, 2007; Lemon, Tatum, & Turley, 2000; Robson, Humphrey, Khalifa, & Jones, 2007). Currently, this new expertise may only partially exist within the auditing profession, given that until recently auditors have not been trained to appropriately make use of business model information and EBS types of evidence. In Hypothesis 1 we examine auditors’ ability to use business model information and in Hypotheses 2a and 2b we examine the use of EBS evidence under different combinations of other forms of evidence.

The client as a strategic opponent

Given the decision has been made to commit an accounting fraud, client management then becomes a strategic opponent of the auditor. A strategic opponent engages in goal-oriented manipulative behaviors contingent on the anticipated reactions of the opponent (Antle, 1982; Bell et al., 2005; Fellingham & Newman, 1985; Wilks...
Client management’s overall deception includes a concealment strategy intended to minimize the chance of detection. Such a strategy may include a rationale for fraudulent manipulation of selected financial statement numbers (e.g., overstatement of revenue based on a claimed positive response of customers to new products), altered or fabricated evidence consistent with the rationale and a contextual explanation to ‘support’ the financial manipulations. Such concealment strategies may include client management’s likely awareness that auditors use specific analytical procedure comparisons during audit planning.

An auditor’s partial defense against a fraud concealment strategy is to understand the objectives and success factors of the client’s business. Contemporary risk-based auditing emphasizes that an understanding of the design of the client’s business model provides an opportunity to obtain different audit evidence and conclude what are the likely (and unlikely) financial numbers (Knechel, 2007; Schultz, Bierstaker, & O’Donnell, 2010). Given the client’s business strategy and strategic objectives, certain business processes will be critical success factors (Bell, Peecher, & Solomon, 2002; Kopp & O’Donnell, 2005) that will be relevant for developing expectations and risk assessments.

Bell et al. (2005, Fig. 3.2) provide a model of evidence-driven, belief-based risk assessments that incorporates the level of compatibility between the economic performance of the business entity during the period and the asserted financial statement numbers. In this model, auditors obtain and interpret evidence from multiple sources, revise their beliefs, then update their mental models to develop expectations about the entity’s business state during the period. Assessment of the degree of compatibility of the results of the operation of the client’s business model with the client’s financial statement representations will impact the auditor’s selection of additional evidence and will affect risk assessments. We situate our study at the point in this model where the auditor considers different levels of compatibility between the magnitude and relationship of numbers in the financial statements with the evidence pertaining to the operation of the client’s business model. This normative model predicts that auditors will be able to assess this compatibility between financial statements and evidence relating to the operation of the client’s business model.

Strategically, management will likely know from previous experience and from university training that auditors apply analytical procedures as part of their audit planning process and that certain financial statement comparisons are expected. For example, auditing standards state that “the auditor will ordinarily expect greater consistency in comparing gross profit margins from one period to another than in comparing discretionary expenses such as research or advertising” (ISA 520.12e). Given this type of knowledge, the strategic client will expect that an auditor will interpret a significant increase in the gross margin percentage as an indication of potential financial statement fraud. When revenue has been increased fraudulently to achieve a particular profit, two possible concealment strategies of management are discussed below.

First, acknowledge an increase in the gross margin ratio (keeping constant discretionary expenses, e.g., selling and administration) and create an explanation that would account for this increase; for example an unexpectedly high level of performance in one or more business processes would mean that better financial statement results and ratios (e.g., higher gross margins) are to be expected. In our study, the contextual explanation was that the superior performance of the new product development process led to more satisfied customers who purchased more products. This rationale and explanation would result in financial statement numbers (MBR evidence) which are highly compatible with the client’s strategic objectives and claimed success of the client’s business model during the period. Thus, we label this strategy as ‘higher compatibility with the business model’. On the other hand, the lack of consistency in gross profit margins would be a consideration for the auditor (ISA 520).

Second, a strategy where the cost of goods sold number is increased so that the gross margin percentage is consistent with previous gross margin percentages, while a more discretionary expense number (selling and administrative expense) is decreased. This concealment strategy creates consistency in the financial statement relationships on which the auditor is anticipated to concentrate (e.g., gross margin), thereby diminishing relative scrutiny by the auditor when the audit plan is formulated as key ratios are not significantly different from those of the previous year. However, while such a concealment strategy may draw less attention from auditors using ratio analyses, it is less compatible with the expected performance of the client’s business model during the period. That is, given the client’s business model, it would be expected that superior performance of the new product development process and more satisfied customers would result in increased sales, a higher gross margin and higher selling expenses (as per Bell et al., 2002). We label this as ‘lower compatibility with the business model’.

Given that client management has implemented a concealment strategy, we test whether auditors can use evidence on the performance of the client’s business model during the period to interpret correctly the fraud risk implications of concealment strategies including a false explanation from management. Previous research indicates that auditors tend to overstate the veracity of a non-error explanation (e.g., Anderson & Koonce, 1998; Heiman, 1990; Hirst & Koonce, 1996; Koonce & Phillips, 1996; McDaniel & Kinney, 1995; Trompeter & Wright, 2010) and its completeness (Anderson & Koonce, 1998; Bedard & Biggs, 1991; Glover, Jiambalvo, & Kennedy, 2000). These limitations are especially relevant when management is attempting to conceal a fraud from the auditor and offers a false non-error explanation.

In the scenario described above, SSA auditing predicts that relatively higher and lower degrees of compatibility

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4 “Corrupt managers may tell auditors half-truths and try to lead auditors down the primrose path by distorting assertions and their supporting documentation” (Bell et al., 2005, pp. 19-20).

5 Furthermore, USA standards (SAS 56, AU Section 329; AICPA, 2005) note that “as expectations become more precise, the range of expected differences becomes narrower and accordingly the likelihood increases that significant differences from the expectations are due to misstatements” (AU 329, para. 17).
of key financial numbers with the performance of the client’s business model during the period (Bell et al., 2002, 2005) will affect fraud risk assessments. The model would predict that auditor assessments of the probability of the (seeded) fraud as a cause for the unexpected higher revenue will increase when the financial statement numbers are less compatible with results claimed to have been achieved by operation of the client’s business model during the period.

Hypothesis 1. The assessed probability of a (seeded) fraud will be higher under a client concealment strategy that results in lower compatibility of the financial statements with the performance of the client’s business model during the period, versus a concealment strategy that results in higher compatibility to the business model.

The impact of EBS evidence

The Bell et al. (2005, p. 5) model suggests that EBS, MII and MBR each constitute fundamental sources of audit evidence that possess unique strengths and weaknesses, and that these sources of evidence are complementary rather than substituting. A major consideration for audit evidence is the extent to which management can manipulate the content of both MBR and MII evidence. Bell et al. (2005, p. 28) highlight that the use of EBS evidence is important because consistency between MII and MBR does not ensure reliable financial statements. Therefore, the auditor may obtain evidence on the performance of the client’s business model from outside the client organization, e.g., levels of, and changes in, customer satisfaction. EBS evidence can be highly diagnostic of likely account balances because it is a direct manifestation of the success, or lack thereof, of the client’s business model during the period. Also, since EBS evidence is obtained externally, it is more difficult for management to manipulate, compared with MBR and MII evidence (Bell et al., 2005).

We examine the impact of EBS evidence given different levels of consistency between the implications of MBR and MII evidence. Assuming two levels of MBR and MII evidence based on their fraud risk implications, there are four possible fraud risk profiles of MBR and MII evidence. These are labeled A to D in Table 2: (A) lower business model compatibility MBR (higher fraud risk) and favorable MII performance (lower fraud risk); (B) lower business model compatibility MBR (higher fraud risk) and unfavorable MII performance (higher fraud risk) and favorable MII performance (lower fraud risk); (C) higher business model compatibility MBR (lower fraud risk) and unfavorable MII performance (higher fraud risk); and (D) higher business model compatibility MBR (lower fraud risk) and unfavorable MII performance (higher fraud risk). Profiles A and D depict inconsistent fraud risk implications of the MBR and MII evidence; while Profiles B and C suggest consistent fraud implications (Profile B provides two higher risk signals; Profile C provides two lower risk signals).

We first consider the implications of the MBR and MII evidence being inconsistent (Profiles A and D). Following the Bell et al. (2005) model the three different types of evidence are complementary and if the MBR and MII evidence provide contradictory signals (as above) the auditor is likely to be able to improve audit quality by acquiring and evaluating additional EBS evidence. Thus the evaluation of EBS evidence is important to the fraud risk assessments of participants in this situation.

Hypothesis 2a. When MBR and MII evidence jointly imply inconsistent risk implications, unfavorable EBS evidence will result in higher fraud probability assessments than will favorable EBS evidence.

When the profiles of MBR and MII evidence are consistent in their fraud risk implications, i.e., Profiles B and C, the incremental benefit of EBS evidence will depend on whether both the MBR and the MII evidence suggest either higher or lower fraud risk. When the MBR/MII evidence profile consistently suggests higher fraud risk (Profile B), EBS evidence is likely to have little impact on fraud risk assessments. Bell et al. (2005) suggest that if fraud is present, management can usually influence or control both MII and MBR evidence. Thus, consistent evidence of higher fraud risk from both evidence sources should give two signals of fraud before the implications of EBS evidence are considered. Accordingly, additional evidence indicating the potential for fraud should have limited impact on the fraud risk assessments. However, when both the MBR and the MII evidence suggest a lower likelihood of fraud and a fraud has been committed, EBS evidence should be especially informative. Bell et al. (2005) note that skepticism of management’s claims should result in the auditor having a questioning mind about management-controlled sources of evidence, usually MBR and MII evidence. They suggest that consistent MBR and MII evidence provides the auditor with two different possibilities: “(1) the MII and MBR are reasonable in light of EBS and (2) the MII and MBR are both unreasonable in light of EBS, potentially due to strategic management fraud ... initial evidence from either MII or MBR that seemingly supports assertions should be presumptively doubted until it is corroborated via triangulation” (Bell et al., 2005, pp. 34–35). In fact, the basic conceptualization of triangulation by Bell et al. recognizes that consistency between MII and MBR does not ensure reliability of the financial statements (p. 28) and that EBS evidence may provide relevant and new audit insights to challenge conclusions based on MBR or MII evidence (p. 31).

Hypothesis 2b. When MBR and MII evidence jointly imply consistent fraud risk implications, EBS evidence will affect fraud probability assessments more when the consistent MBR/MII evidence suggests lower fraud risk compared to when consistent MBR/MII evidence suggests higher fraud risk.

Research methods

Participants

One hundred and twenty-four auditors attending a national training class of a Big 4 audit firm completed the experiment. We imposed the requirement that each auditor
satisfy both MII and EBS evidence manipulation checks, and 102 participants satisfied the criteria, including one manager and 101 seniors. The average audit experience for the participants was 37 months. All of the participants completed the experiment in less than 50 min.

**Experimental design, context and dependent variables**

We started with a $2 \times 2 \times 2$ between subjects design with MBR, MII and EBS each manipulated to provide either higher or lower fraud risk. The two levels of MBR and two levels of MII evidence items were combined to provide four profiles of either consistent (both higher or both lower fraud risk) or inconsistent (one higher and one lower fraud risk) overall fraud risk. In addition, we manipulated EBS evidence across two levels indicating higher or lower risk of fraud. The main dependent variable is the probability of the seeded fraud. Participants provided probabilities of seven potential causes of the higher-than-expected sales number, including four non-error causes corresponding to economic events (e.g., a change in market share), two fraud causes (the seeded backlog fraud and a fabricated sales fraud) and an unintentional error (see Table 1, Panel A). The participants were instructed that the total of the seven probabilities should add to 100 points. The probability of the actual seeded fraud is of prime interest because while the heightened risk of fraud increases evidence collection, it does not tell auditors where to look for the fraud. When the likelihood of a particular type of fraud increases, the auditor gathers specific evidence to examine the risk of this particular fraud (Hammersley, 2011). In addition, participants provided risk of material fraud assessments for sales, cost of goods sold (COGS) and selling and administrative (S&A) expenses. These three assessments were made on a continuous scale ranging from 1% to 100% with the end points labeled ‘Lowest Risk’ and ‘Highest Risk’, respectively.

**Table 1**
The seven possible explanations for the higher-than-expected sales.

| Panel A: Elicitation of the seven probabilities of causes of the unexpectedly high revenue |
| Based on the information provided in the case, indicate the probability that each of the following seven reasons explains the higher-than-expected sales amount. Allocate a total of 100 points, representing 100% probability, to the seven reasons indicated below. Each point allocation represents your probability that the specific reason explains the variance between your sales estimate and the client’s unaudited sales number of $196,051,000. |
| The total of all of the allocations (i.e., probabilities) should equal 100 points. |
| — A change in the prices of American Toy’s products during 2005 (p1) |
| — A change in the product mix sold during 2005 (p2) |
| — A change in overall demand for toys in the US toy market during 2005 (p3) |
| — A change in American Toy’s market share during 2005 (p4) |
| — Premature recognition in 2005 of 2006 sales orders (p5) |
| — Fabrication and recognition of non-existent, fictitious sales in 2005 (p6) |
| — Unintentional errors either made by users of the accounting system or other accounting system error during 2005 (p7) |
| Total of 100 points |
| p1 | p2 | p3 | p4 | p5 | p6 | p7 |
| Higher compatibility to the business model | 14.71 | 15.24 | 12.90 | 15.16 | 21.53 | 13.43 | 7.02 |
| Lower compatibility to the business model | 12.98 | 13.32 | 11.17 | 11.98 | 29.25 | 13.72 | 7.58 |

Higher compatibility to the business model = higher level of compatibility between the financial statements and the client’s business model. Lower compatibility to the business model = lower level of compatibility between the financial statements and the client’s business model.

**Context and information**

The participants received a summary of information in preparation for planning an audit of a toy manufacturer. The summary described the client context, background client information, current information on the client’s competitive situation and information on the governance environment. Also provided were the client’s financial and operating results, and industry conditions, all of which were developed using financial accounting and economic relationships from an actual toy manufacturer. The audit team had added to the information summary their representation of the client’s business model, including the client’s business strategy, strategic objectives (critical success factors), and key performance indicators (Bell et al., 2002), as well as a portion of the client’s Balanced Scorecard that was used for internal managerial purposes. While this information on the business model adds to the complexity of the case, within an SSA approach to auditing such an understanding “is paramount for ensuring the quality of the entire audit process” (Peecher et al., 2007, p. 470).

The financial statements included extracts from the current year’s unaudited income statement, the previous 2 years’ audited income statements and a graphical representation of sales, COGS and the client’s gross margin over the 3-year period (MBR evidence). In addition, participants received a series of financial and non-financial cues indicating that the company had been dealing with increased competition and operational challenges during the year. However, while sales and profitability had declined in the previous 2 years, the most recent unaudited results indicated an improvement. Participants were also presented with a narrative that described the corporate governance environment, including the CEO’s dominant personality and the aggressive promises he made to the shareholders. A staff auditor had performed a preliminary
analytical review of the client’s sales balance, noting that sales were higher than was expected by $5,574,000 (2.92%). Also included were the team’s conclusion on the performance of the client’s new product development group during the period, resulting in higher customer satisfaction, and, therefore, several large unexpected sales orders being received at year-end.6

As is noted above, the participants reported probabilities for seven potential causes of the unexpectedly high revenue fluctuation. One of the two potential fraudulent causes was the actual fraud seeded in the income statement, i.e., premature recognition of sales in the current year of unfilled orders which pertained to the subsequent year (p5 of the seven potential causes—see Table 1, Panel A). Relevant information related to the fraud included that order backlog at year-end had decreased by $14.6 million, and order backlog as a percentage of sales decreased from 30% to 21% at year-end.6

6 The other potential fraudulent cause listed in Table 1, Panel A was fabrication and recognition of non-existent fictitious sales (p6). Only (p5) was included as the dependent variable because it is the seeded fraud and it is most consistent with the facts in the case including the information related to the change in the order backlog.

Independent variables

We manipulate MBR evidence to show higher or lower compatibility between the client’s income statement amounts and the performance of the client’s business model. We do this by using two client concealment strategies with both strategies resulting in the same overstatement of sales and profitability.

The two concealment strategies implement the two levels of compatibility of the income statement amounts with the client’s business model (strategic objectives and claimed results of operations during the period) which comprise our manipulation of MBR. For the higher compatibility to the business model strategy we inflated the sales figure and, therefore, the gross profit percentage but no changes were made to any other income statement amounts. This set of financial information is provided in Fig. 2, Panel A. Overall, use of this concealment strategy and the resulting financial numbers achieves higher compatibility to the business model with the client’s strategic objectives and (claimed) results of operations during the period including claims of improved new product development and better customer satisfaction. This explanation is consistent with the strategic linkages manifested in the auditor’s representation of the client’s business model and client management’s Balanced Scorecard, both of which were available to all of the participants.

For the lower compatibility to the business model strategy, we inflated the COGS number to produce a gross profit percentage similar to the percentages for the previous

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<th>Lower compatibility to the business model (higher risk)</th>
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<td>Unfavorable EBS (higher risk)</td>
<td>L</td>
<td>26.30</td>
<td>18.40</td>
<td>10</td>
<td></td>
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<tr>
<td>Total</td>
<td>Favorable EBS (lower risk)</td>
<td>19.81</td>
<td>13.97</td>
<td>28</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Unfavorable EBS (higher risk)</td>
<td>24.67</td>
<td>15.51</td>
<td>21</td>
<td></td>
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<td></td>
<td></td>
<td>21.53</td>
<td>14.75</td>
<td>49</td>
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</table>

p5 - seeded accounting backlog fraud which inflated sales by prematurely recognizing next year’s sales in the current year. Higher (Lower) compatibility to the business model is higher (lower) level of compatibility between the financial statements and the client’s strategic objectives and operating results for the period. Higher compatibility features gross margin ratio increasing (overstatement of total gross margin) whereas lower compatibility features constant gross margin achieved by an understatement of SG&A expenses. Sales and profitability are inflated by the same amount in both treatments.

Condition C is most critical to the paper as this is the condition where both MBR and MII show lower levels of fraud risk. However, given both MBR and MII are more easily manipulated by management, it is the situation where EBS evidence can be of most help to the auditor if management has perpetrated a fraud and concealed the fraud by manipulating evidence under its control.

Tests of Hypotheses:

H1: E, F, G, H versus I, J, K, L.
H2a: F + L versus E + K.
H2b: H – G < J – I (expect J – I to be significant; H – G to be non-significant).
American Toy’s 2005 (unaudited), 2004 (audited) and 2003 (audited) financial statements

Panel A: ‘Higher compatibility to the business model’ concealment strategy (higher MBR compatibility)

The American Toy Company
Consolidated Statement of Income
For the years ended December 31, 2005, 2004, and 2003 (in thousands)

<table>
<thead>
<tr>
<th></th>
<th>2005 (unaudited)</th>
<th>2004 (audited)</th>
<th>2003 (audited)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>196,051</td>
<td>185,831</td>
<td>190,345</td>
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<tr>
<td>Cost of sales</td>
<td>103,927</td>
<td>105,998</td>
<td>107,621</td>
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<tr>
<td>Gross Profit</td>
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<td>79,833</td>
<td>82,724</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td>70,191</td>
<td>66,711</td>
<td>67,272</td>
</tr>
<tr>
<td>Operating Income</td>
<td>21,933</td>
<td>13,122</td>
<td>15,452</td>
</tr>
<tr>
<td>Interest expense</td>
<td>2,965</td>
<td>2,973</td>
<td>2,973</td>
</tr>
<tr>
<td>Income Before Income Taxes</td>
<td>18,968</td>
<td>10,149</td>
<td>12,479</td>
</tr>
<tr>
<td>Provision for Income Taxes</td>
<td>1,743</td>
<td>192</td>
<td>744</td>
</tr>
<tr>
<td>Net Income (Loss)</td>
<td>17,225</td>
<td>9,957</td>
<td>11,735</td>
</tr>
</tbody>
</table>

Panel B: ‘Lower compatibility to the business model’ concealment strategy (lower MBR compatibility)

The American Toy Company
Consolidated Statement of Income
For the years ended December 31, 2005, 2004, and 2003 (in thousands)

<table>
<thead>
<tr>
<th></th>
<th>2005 (unaudited)</th>
<th>2004 (audited)</th>
<th>2003 (audited)</th>
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<tbody>
<tr>
<td>Net Sales</td>
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<td>185,831</td>
<td>190,345</td>
</tr>
<tr>
<td>Cost of sales</td>
<td>111,749</td>
<td>105,998</td>
<td>107,621</td>
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<tr>
<td>Gross Profit</td>
<td>84,302</td>
<td>79,833</td>
<td>82,724</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
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<td>66,711</td>
<td>67,272</td>
</tr>
<tr>
<td>Operating Income</td>
<td>21,933</td>
<td>13,122</td>
<td>15,452</td>
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<tr>
<td>Interest expense</td>
<td>2,965</td>
<td>2,973</td>
<td>2,973</td>
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<tr>
<td>Income Before Income Taxes</td>
<td>18,968</td>
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<tr>
<td>Provision for Income Taxes</td>
<td>1,743</td>
<td>192</td>
<td>744</td>
</tr>
<tr>
<td>Net Income (Loss)</td>
<td>17,225</td>
<td>9,957</td>
<td>11,735</td>
</tr>
</tbody>
</table>

Fig. 2. The audit client’s two concealment strategies and MBR evidence.
During the year 2005, the S&A expense was reduced by 6.5% (see Bedard & Biggs, 1991 for a similar manipulation). This set of financial information is provided in Fig. 2, Panel B. Management is likely to anticipate the types of tests to be performed by the auditor, so this strategy places primary emphasis on avoiding significant variance in the gross profit margin ratio which is generally considered by the auditor. The S&A expenses, especially the sales expenses, are more discretionary than COGS (and the resulting gross margin) and, therefore, are less likely to alert the auditor to a problem (ISA 520.12c). However, these changes cause the income statement to be less compatible with the client's business model and (claimed) results of operations during the period. This is because, compared with the previous year, the very similar gross margin percentage is incompatible with the claim of improved new product development (and higher product prices) during the period. Also, the lower S&A expense than the previous year is less compatible because successful new product development likely would require incremental sales promotion expenses.

At the planning phase, it is likely that an auditor would evaluate the client’s causal explanation for the higher-than-expected sales by testing for (1) the asserted improvement in new product development performance and/or (2) the asserted increase in customer satisfaction being the basis for the claim of ‘several large unexpected orders’ and the better (and fraudulent) results. These two audit tests correspond, respectively, to our interpretation of the MII and EBS evidence concepts.

The audit team’s conclusion regarding the client’s assertion that new product development had improved significantly is the first link in the client’s explanation. The included portion of the client’s Balanced Scorecard supports the strategic importance of improving the new product development process to increase customer satisfaction. The MII evidence obtained by the audit team is primarily internal to the client, i.e., after a brief search of the Internet, the auditor communicated with the new product development manager and examined performance reports that were not generated by the client’s financial accounting system. The two distinct levels of the MII evidence are professional judgments made by the audit team that new product development performance had (or had not) improved during the year.7

“The audit team followed up on management’s indication of improved new product performance and higher customer satisfaction during 2005 by communicating with the manager of the new product development team and by reading the team’s performance summaries. They also conducted a brief search using the Internet. They concluded that the performance of the new product development team had (or had not) improved significantly during 2005” (emphasis added).

Next, the auditors considered evidence on any change in customer satisfaction (EBS evidence). An increased level of customer satisfaction is, everything else being held constant, consistent with a higher level of sales and profitability. The EBS evidence was indicated to have been obtained from an independent, professional survey organization, J.D. Powers and Associates, and indicated that the client’s level of customer satisfaction had (or had not) increased during the year:

“In order to obtain additional evidence, the auditor obtained and studied the most recent customer satisfaction survey results for American Toy in 2005 from the well-respected, professional J.D. Powers and Associates. J.D. Powers and Associates indicated in their preliminary industry survey that customers of American Toy reported that their satisfaction with buying products from American Toy had (or had not) increased significantly during 2005” (emphasis added).

Procedure

The participants were asked to assume the role of the senior auditor planning the audit engagement. They received the detailed audit case described above. After reading the background information, the participants considered the client’s previous 2 years’ audited income statements, the current year’s unaudited income statement, and a graphical representation of sales, COGS and the client’s gross margin over the 3-year period (these numbers and graphs differed for the lower compatibility and higher compatibility treatments). The financial statement evidence was followed by the client’s explanation for higher-than-expected sales, the MII evidence and the EBS evidence descriptions. At this point, the participants made three risk of material fraud assessments and they assigned probabilities to each of the seven cycle-specific possible causes of the revenue fluctuation. Having completed the above tasks, participants provided some further background questions including levels of audit experience.

Results

Manipulation checks

We implemented two manipulation checks for awareness of the MII evidence and the EBS evidence. The participants were asked whether the audit team had concluded that the performance of the new product development team had improved significantly (MII) and whether there had been a change in customer satisfaction as per the report by J.D. Powers and Associates (EBS). Overall, 22 of 124 participants failed one or more of the manipulation checks.
checks for MII or EBS evidence and were removed from the sample.8

Impact of client concealment strategies and resulting MBR evidence

Table 2 provides the mean and standard deviations for the cells of various combinations of MBR, MII and EBS evidence for our seeded backlog fraud probability (p5). We ran a $2 \times 2 \times 2$ ANOVA with MBR, MII and EBS as the independent variables, and the backlog fraud (p5) as the dependent variable, to first partition the various sums of squares and get the error term. We then completed planned comparisons using that ANOVA’s error term structure.9 In order to test H1 we compared the p5 probability assessments for our two MBR compatibility treatments. The results reported in Table 2 show that the auditors reported a higher level of fraud risk for the lower compatibility to business model strategy, i.e., a significantly higher mean p5 probability ($t = 2.139$, $p = 0.02$, one-tailed) for the higher compatibility to the business model strategy, an increase of 36%. These results support H1. (Also consistent with H1 are the respective medians of 25 and 17.)

Given the difference in the seeded fraud probability assessments for the two concealment strategies, not surprisingly, there also was an impact on the probabilities for the other six potential causes of the revenue fluctuation (see Table 1 and Fig. 3). First, note that the mean probability for the recognition of non-existent, fictitious sales (the second feasible fraud cause, p6) is unaffected by the client concealment strategy, i.e., the participants did not suggest different levels of risk for the fraud that, in fact, did not occur. Second, adding further precision to the participants’ p5 backlog fraud assessments, the magnitude of the risk of an unintentional error (p7) was not affected by the concealment strategy that was implemented. Third, the higher compatibility to business model strategy resulted in increases in the four remaining potential non-error economic causes (p1–p4). All four potential causes received a higher mean probability relative to the lower compatibility to business model strategy (Fig. 3), although the differences in the vectors of four probabilities for the two concealment strategies are not significant, $F(4,97) = 1.113$, $p = 0.36$.

The impact of EBS evidence

H2a predicts that customer satisfaction (EBS) evidence will impact fraud risk assessments when the risk implications of the MBR and MII evidence are inconsistent (Profiles A and D in Table 2). The results are reported in Table 2 and Fig. 4. From Fig. 4 it can be seen that the probability of the seeded fraud p5 is always higher when EBS evidence suggests higher fraud risk (the claimed increase in customer satisfaction did not occur), versus when the EBS evidence suggests lower fraud risk (increased customer satisfaction). In order to test H2a, we condition on the two inconsistent MBR and MII profiles (A and D in Table 2) and we compare the difference in the seeded fraud probability (p5) for the two EBS levels. Consistent with the
normative model, when the EBS evidence suggests higher fraud risk, the mean p5 probability of 30.14 (average of 33.33 and 26.30, F and L in Table 2) is significantly higher compared with the mean p5 probability of 19.85 (average of 24.15 and 15.86, for E and K in Table 2) (t = 2.015, p = 0.03, one-tailed). H2a is supported.

H2b considers the situations where the MBR and MII evidence both consistently indicate either a higher (B in Table 2) or lower (C in Table 2) risk of the seeded backlog fraud (p5). The predicted impact of EBS evidence on p5 is contextual. H2b predicts that when the MBR and MII risks jointly have consistent risk implications, the impact of EBS evidence on p5 will be larger when the MBR/MII evidence suggests lower risk compared to when the consistent MBR/ MII evidence suggests higher risk. Testing of H2b involves planned comparisons of the impact of EBS evidence levels given consistently lower versus consistently higher risk profiles of MBR and MII evidence. When the MBR and MII evidence consistently suggests higher fraud risk, as was predicted, the difference between the EBS evidence levels is small and not significant (Table 2, Profiles G and H, i.e., 28.85 and 30.73, t = 0.250, n.s.). This is consistent with H2b. When the MBR and MII evidence consistently suggests lower fraud risk, H2b suggests unfavorable (higher risk) EBS evidence will result in significantly higher fraud risk than will favorable (lower risk) EBS evidence. The relevant p5 means correspond to Profiles I and J in Table 2: the difference in the means is not significant (22.50 versus 23.18, t = 0.116, n.s.). This is not consistent with H2b. Thus H2b is only partially supported by the data; inconsistent with the normative model, EBS evidence did not impact participants’ fraud risk assessments in the situation where it should be of most value, i.e., where both MBR and MII indicate lower risk of fraud but both forms of evidence are subject to potential manipulation by those who perpetuated the fraud. Given EBS evidence did impact fraud risk assessments in other treatments (see treatments A and D in Table 2) it appears that the explanation for the above result is not that auditors cannot extract information from EBS evidence, but rather that they did not understand its potential informativeness in this important circumstance.

Additional analysis

Our additional analysis examines the risk of material fraudulent misstatement (RMF) for sales. We tested for significant differences in the RMF (sales) assessments between the two concealment strategies. The RMF (sales) risk assessment (×100), with the same sales number in both concealment strategies, is not significantly different, i.e., 63.55 (higher compatibility to the business model strategy) versus 61.00 (lower compatibility to the business model strategy), t = 0.561, n.s.10 Next, as this risk of mate-

10 As we expected, the auditors assigned significantly different RMF for the COGS and S&A numbers given the two concealment strategies. Given the higher gross margin percentage, the auditors assigned a significantly higher risk (×100) for the COGS number for the higher compatibility to the business model strategy, 58.76 versus 43.42, t = 3.414, p = 0.001, one-tailed. Also expected given the lower S&A expense for the lower compatibility to the business model strategy, the risk of material fraud for S&A expense was higher for this strategy, 59.87 versus 31.37, t = 5.952, p < 0.001, one-tailed.

rial fraud assessment is more general than the specific seeded fraud that resulted in the higher-than-expected sales number, we regressed the RMF (sales) assessments on the p5 and p6 probabilities of the auditors, i.e., premature recognition of next year’s sales (p5) and fabrication of sales (p6). As we expected, the RMF assessments are significantly associated with both the p5 and p6 cause probabilities, i.e., coefficients of 0.219 (t = 1.753, p = 0.04) for p5 and 0.640 (t = 2.971, p = 0.002) for p6. The auditors generated risk of material fraud assessments that were significantly related to both feasible types of accounting fraud. These results indicate construct validity for the RMF sales assessments.

Discussion and future research

We developed a situation where an accounting fraud involving overstating of sales revenue was implemented by client management. Senior auditors evaluated potential causes of the higher-than-expected revenue, including the probability of a material seeded fraud, given a fraudulent explanation from management. Following the model of belief-based risk assessments developed by Bell et al. (2005), using two different client concealment strategies, we varied the level of compatibility between the content of the financial statements and the results of the client’s business model. The auditors correctly detected the different levels of fraud risk implied by the two concealment strategies and the resulting levels of compatibility with the business model. Specifically, for the higher compatibility to the business model strategy, the participants assessed the probability of the seeded fraud (p5) to be significantly smaller than for the lower compatibility to the business model strategy. These results are consistent with the Bell et al. normative model. In this model, the SSA auditor needs to acquire an understanding of how well management is executing its business model allowing the auditor to develop expectations that can later be compared with management’s asserted financial statement amounts (Bell et al., 2005; Peecher et al., 2007). Our results show that participants used information on the client’s business model in making fraud risk assessments.

The key issues addressed in our study relate to the use of external evidence, providing information about underlying business performance, on auditors’ fraud risk assessments. Given the potential importance of this EBS evidence for fraud identification (Bell et al., 2005; Peecher et al., 2007), we examined the extent to which, and under what conditions, EBS evidence is used by auditors. Specifically, we tested for a marginal impact of EBS evidence when the MBR and MII evidence jointly imply inconsistent or consistent risk implications. First, when the MBR and MII evidence was inconsistent, providing conflicting signals as to the likelihood of fraud, unfavorable EBS (higher risk) evidence compared to favorable EBS evidence (lower risk) resulted in a significant increase in the likelihood of fraud. This is consistent with the normative model which suggests that if the other two forms of evidence provide conflicting signals, audit quality will improve by considering additional EBS evidence (Bell et al., 2005).

A different situation is when the implications of the MII and MBR evidence are consistent, i.e. both suggest higher
or lower fraud risk implications. We found that when they both suggest higher risk, consistent with the normative model, the use of EBS evidence was limited because both previous signals indicate higher fraud risk, even though these signals can be more easily manipulated by management. However, when both the MBR and MII suggest lower risk, the normative model suggests that EBS evidence would be particularly useful because EBS evidence should help the auditor “to spot MBR that are too good to be true” (Bell et al., 2005, p. 29). However, we found that EBS evidence did not impact fraud risk assessments when both MBR and MII suggest lower fraud risk. This finding is incongruous with the Bell et al. (2005, p. 35) model suggestion that “initial evidence from either MII or MBR that seemingly supports assertions should be presumptively doubted until it is corroborated via triangulation”. This result is of concern because this is the circumstance where EBS evidence could be of the most benefit (Bell et al., 2005). More generally, if management has committed a fraud and has been strategic enough to alter the evidence that is generally under their control, audit quality would benefit by making use of external evidence outside management’s control in this circumstance. Auditors failure to use external evidence as a means of ensuring the veracity of management-controlled, internal evidence is more consistent with a credulous than with a skeptical mindset.

The question arises as to why EBS evidence was not found to affect fraud probability assessments in the situation where management-controlled evidence suggests lower risks. We suggest this result is most likely due to auditors’ overconfidence in the ability of traditional evidence, such as MBR and MII evidence, to detect fraud and/or the auditors undervaluing EBS type evidence which they have traditionally been less likely to collect. Some recent research has suggested that auditors rely much more on the type of evidence they have traditionally used rather than EBS evidence. For example, Harding and Trotman (2011) find that auditors given certain indications of fraud and asked to select additional pieces of evidence, rarely selected EBS evidence. Thus, while Bell et al. (2005) warn that “obtaining more evidence of a particular kind may not compensate for evidence that otherwise is of poor quality” (p. 26), it appears that auditors still tend to rely on traditional sources of evidence in these circumstances. In fact, Hammersley, Johnstone, and Kadous (2011) find, from in-depth analysis of specific audit program modifications, that while seniors modify the program where appropriate, they modify procedures in ineffective ways, with the bulk of the modifications being “indiscriminate increases in sample sizes”. This suggests the need for practitioners to consider the need for training that illustrates the benefit of triangulation and the use of evidence in situations where other forms of evidence that are under management’s control suggest that fraud is not present. Research that examines the effectiveness of alternative training methods and content in this area would be beneficial.

This is an initial study to experimentally examine triangulation. As a result, there are some potential limitations resulting from difficult choices related to the content of independent variables. First, we chose only one type of each of MBR, MII and EBS evidence, each having two levels. There are many other examples of the three types of evidence and they vary in their susceptibility to management manipulation. Future research can further refine the impact of different forms and levels of MBR, MII and EBS evidence including variations in the diagnosticity of each type of evidence. For example, if MBR or MII is so diagnostic of fraud, unfavorable EBS evidence may not impact the fraud risk assessment but may impact confidence. In fact, our study does not measure auditors’ prior beliefs which is a possible explanation for auditors not using EBS evidence when it would have been most helpful. However, regardless of one’s prior beliefs, auditors still need to gather positive evidence to support an opinion of no error. Second, the different sources of evidence have different levels of independence from management. There are other ways of varying the extent of that independence and these could be addressed in future research. For example, discussion by Budescu et al. (2011) is useful in distinguishing between different forms of MII evidence and the likelihood of it being manipulated by managers. Third, the impact of EBS evidence may vary with other factors of the audit environment, including risk, management profile, review processes, etc. The circumstances where EBS evidence is/is not relied upon requires further research. Fourth, our study is about the evaluation of evidence. Future research may focus on the search for and selection of EBS evidence and how that varies with different combinations of MBR and MII evidence. Fifth, while there are benefits of using a rich set of research materials, the complexity results in the need for participants to digest a large and complex pattern of experimental stimuli. This could work against finding evidence in support of our predicted behavior. Finally, our finding that EBS evidence did not impact fraud risk assessments, when the other forms of evidence did not signal fraud, deserves further attention. Assessment of methods for improving professional skepticism in this situation would be useful.

Acknowledgements

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References
