A Framework for Identifying (and Avoiding) Fraudulent Financial Reporting*

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ABSTRACT

This commentary analyzes the relationship of fraud risk assessments to other risk assessments by auditors. The Public Company Accounting Oversight Board notes that this is a problem area of current practice. Effective detection of fraudulent financial reporting requires an integrative accounting/auditing conceptual framework. As a result, this paper is as much about accounting theory as it is about auditing. To simplify the development of such an integrated framework, this paper uses an expanded risk model. This effectively results in a risk perspective on fraudulent financial reporting. There are many potential implications but the major findings are as follows. First, the study identifies the crucial role of benchmarks based on acceptable levels of risk to help differentiate between intentional and unintentional misstatements. Such differentiation is critical to successfully implementing the American Institute of Certified Public Accountants' *Statement on Auditing Standards* (*SAS*) *No. 99* and international standards *ISA Nos. 240*, *540*, and *700*. Second, the paper shows the importance of not allowing the major categories of risks identified here from getting too high. This paper explains the need to set acceptable levels of these risks, either by standard-setters as a matter of broad policy, or by individual practitioners as part of the terms of specific engagements. I propose that a major factor in the concept of "present fairly" be the acceptable levels of accounting risks that are defined here, especially the risks due to intentional forecast errors. Third, this paper clarifies how the fraud risk of *SAS No. 99*, and similar international standards, relates to the current audit risk model framework.

Keywords Accounting theory; Auditing theory; Fairness of presentation in financial reporting; Fraud risk

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CADRE CONCEPTUEL VISANT À DÉTECTER (ET À ÉVITER) L'INFORMATION FINANCIÈRE MENSONGÈRE

RÉSUMÉ

L'auteur analyse la relation entre l'appréciation des risques de fraude et l'évaluation d'autres risques par les vérificateurs. Le Public Company Accounting Oversight Board (PCAOB — 2005 et 2007a) fait remarquer qu'il s'agit d'un problème courant. La détection efficace de l'information financière mensongère exige un cadre conceptuel intégrant la comptabilité et la vérification. C'est pourquoi l'étude de l'auteur porte tant sur la théorie comptable que sur la vérification. Pour simplifier l'élaboration d'un cadre intégratif de cette nature, l'auteur utilise un modèle de risque élargi qui permet d'envisager l'information financière mensongère dans la perspective du risque. Les observations de l'auteur ont de multiples conséquences, mais ses principales constatations sont les suivantes. Premièrement, il définit le rôle crucial des étalons basés sur les niveaux de risque acceptables dans la distinction des inexactitudes (anomalies) intentionnelles et des inexactitudes accidentelles. Cette distinction est indispensable au succès de la mise en application du SAS 99 de l'AICPA et des normes internationales ISA 240, 540 et 700. Deuxièmement, l'auteur démontre l'importance de modérer l'amplification des principales catégories de risques qu'il définit. Cet impératif explique la nécessité pour les normalisateurs, dans l'établissement d'une politique générale, ou pour les professionnels en exercice, compte tenu des conditions de missions particulières, de fixer des niveaux acceptables de risque dans ces domaines. L'auteur propose que dans la conformité à l'obligation de « donner une image fidèle », une importance primordiale soit accordée au respect de niveaux acceptables des risques comptables qu'il définit, en particulier les risques attribuables à des erreurs prévisionnelles intentionnelles. Troisièmement, l'étude clarifie le lien entre le risque de fraude dont il est question dans le SAS 99 et dans des normes internationales similaires, d'une part, et le cadre conceptuel du modèle actuel de risque de mission, d'autre part.

Mots clés : risque de fraude, théorie comptable, théorie de la vérification, image fidèle en information financière

The contribution of this commentary is to outline a framework for identifying fraudulent financial reporting. It can also be used by preparers to help avoid fraudulent financial reporting, especially in developing estimates involving forecasts, assuming that the auditee preparers have the appropriate social, moral, and economic incentives. A recent study has shown that 40 percent of fraudsters "do not consider their actions fraudulent". As a result, one of the key principles for managing the risks of fraud being proposed by a study group of influential organizations is "to avoid potential key fraud risk events" (both quotations are from Anti-Fraud Guidance, 2007: 3, 4). This commentary helps clarify how to avoid fraudulent financial reporting that may be facilitated by the vagueness of current financial reporting standards.

I use the term "fraudulent financial reporting" to refer to intentional misstatements of all types that result in misstatements to the financial statements. This includes misreporting along with misappropriation of assets that result in misstatements in financial reporting as per *Statement on Auditing Standards* (*SAS*) *No. 99* (American Institute of Certified Public Accountants [AICPA], 2005: section AU 316), and equivalent standards such as Canadian

Institute of Chartered Accountants (CICA) *Handbook* section 5135, and *International Standard on Auditing* (*ISA*) *No. 240*. My goal here is to produce a framework for identifying the major risk classes of material misstatements, unintentional as well as intentional, and their relationships to one another in the financial statement audit. The risk of intentional misstatements framework is thus a by-product that can be used to assess the risk of fraud as defined in *SAS No. 99*.

My concept of intentional misstatements includes manipulation of financial reporting via estimates involving forecasts, and intentional misstatements involving facts. The existing research on fraud risk is restricted to fraud involving intentional misstatement of facts detected by audit evidence-gathering procedures (e.g., see Wilks and Zimbelman, 2004 for a review). This research used game theory within a sampling framework and presumed that there existed a single "true" value to be reported. This true value was treated as a fact.

This commentary, in contrast, considers the increasingly important situation where the true value cannot be known with certainty at the time of the audit report because of forecast errors in accounting estimates that pervade accrual accounting. The issue of how to disclose the forecast errors and known facts so that they are not misleading is a basic financial reporting issue that has not been addressed by prior research.

The distinction between forecasts and facts is fundamental to financial reporting (e.g., see Glover, Ijiri, Levine, and Liang, 2005), and therefore also for financial statement auditing that aims to take responsibility for fraudulent financial reporting. Because forecasts are what distinguish accrual accounting from cash basis accounting (Glover et al., 2005), fraudulent forecasts are a major category of fraudulent reporting. Thus, an effective framework for identifying and avoiding fraudulent reporting needs to incorporate fraudulent forecasts as well as intentional misstatements of facts. Such a comprehensive approach is one way to implement recent calls for integrating fraud detection, auditing, and the conceptual framework of financial reporting (e.g., see Benston, Carmichael, Demski, Dharan, Jamal, Laux, Rajgopal, and Vrana, 2007). The urgency of controlling fraud is increasingly being recognized in audit standards such as *SAS No. 99*, but not yet in accounting standards. My conceptual framework aims to address this limitation.

The framework is risk-based like current audit standards and the current audit risk model, but expands the risk analysis in two ways. First, it reflects the evidence-gathering risks of fraud detection procedures and the misstatements of fact that are detected by them. Second, it incorporates the risk effects of intentional errors or biases in the forecasts needed to develop accounting estimates in financial reporting. The assumption here is that financial reporting fraud is becoming so sophisticated (e.g., see Henry, 2004; *The Economist*, 2003, 2005) that it is not sufficient to put all the burden for detecting fraud on just the audit standards. Accounting standards also need to take some of the burden, as suggested by Benston et al. (2007). The need for an accounting/audit integrative framework is created by the new challenges to detect fraud via the financial statement audit.

There is considerable evidence that a fraud identification framework for financial reporting is needed in addition to that noted by Benston et al. (2007). For example, see the views of the Securities and Exchange Commission's (SEC's) Chief Accountant, Nicolaisen (2005: 69), the proposed vision of the largest audit firms (Global Public Policy Symposium

III: 12), AICPA (2007: 32), *The Economist* (2005), Public Company Accounting Oversight Board's (PCAOB's) (2007c: 8–11) ongoing fraud risk assessments and fair value accounting projects, and the proposed Canadian revisions in the auditor's report in line with the *ISA No. 700* (CICA, 2008a). Given that the *ISA No. 700* (IFAC, 2005) audit report is supposed to give as much assurance for freedom from material misstatements due to fraud (intentional misstatements) as for errors (unintentional misstatements), auditors clearly have increased incentives to consider how generally accepted accounting principles (GAAP) may facilitate fraudulent reporting.

Recent articles in the business press suggest that problems of fraudulent or misleading reporting may be getting worse because of increased use of estimates in financial reporting (e.g., *The Economist*, 2003, 2005; Henry, 2004; Benston, 2006).[1] The increased use of fair value accounting being proposed by the Financial Accounting Standards Board (FASB) will tend to further increase these risks (e.g., IFAC, 2008; Gunn, 2008; PCAOB, 2007a; AICPA, 2005: section AU 328.06), in turn raising further questions about fair presentation in the current reporting environment (e.g., see Nobes, 2005; Dean and Clarke, 2005; Alexander, 1999 for excellent overviews). This seems to be a major reason the PCAOB (2005, 2007c: 8–9) is developing a project on risk assessment in financial statement audits.

In a survey of the literature on audit risk assessments, Allen, Hermanson, Kozloski, and Ramsey (2006: 171) call for more normative research to meet the needs of regulators. In this paper I propose a combined accounting/auditing conceptual framework to more comprehensively address fraud in the financial statement audit. Accordingly, I represent the risk of financial reporting fraud in an expanded accounting/auditing risk model. I operationalize this risk by including the assumption, consistent with the *CICA Handbook*'s sections 5135.004–.007 and *SAS No. 99*, that material intentional misstatements or material biases involving predictions are fraudulent (AICPA, 2005: section AU 316.63).

Although *SAS No. 99* (AICPA, 2005: section AU 316.05) and related international standards now require the assessment and documentation of more general fraud risk, there is little guidance as to how such risk assessments fit in with other risk assessments by auditors (e.g., see Allen et al., 2006: 171). With the expanded risk model proposed here, I also recognize that this is a problem of accounting theory and the conceptual framework of financial reporting (and consistent with that proposed in Benston et al., 2007: 234). These insights can have important implications for accountants, including what should be considered as "fairly presented" by accountants when there is a risk of fraud.

The next section focuses on the distinction between intentional and unintentional misstatements. I refer to this as the intentionality issue. The section shows how the current audit risk model can be expanded to explicitly incorporate intentional misstatements — a key concept of *SAS No. 99* (AICPA, 2005: section AU 316.05). A by-product is to show the conceptual limitation of the existing AICPA audit risk model (AICPA 2006: section 153 (*SAS No. 111*)) relative to the requirements of *SAS No. 99*. This section also discusses how the model can be used to assist in planning appropriate amounts of "forensic-type

1. For example, the proposed FASB standard (2004: A13–A19) on fair value measurements makes the challenges fairly explicit.

fieldwork" that apply methods of collecting evidence that presume the possibility of dishonesty, but such presumption is "rebuttable" by the evidence (PCAOB, 2007b: 4–5). Such procedures need to be combined with more traditional audit procedures. Combined assurance is needed so that there is no material misstatement, whether intentional or unintentional.

The following section switches focus to fraud due to misreporting based on manipulating forecasts used in developing accounting estimates. This section is the main part of the paper and demonstrates how intentional misstatements affect the risks associated with estimates in accrual accounting. This section makes a direct link to classical accounting measurement theory concepts on which the evolving FASB/International Accounting Standards Board (IASB) (2005, 2006) conceptual framework for financial reporting is based. The section expands these concepts to incorporate the increasing use of risky estimates in GAAP accounting and shows how the resulting new framework can be used as a fraud/deception detection tool. The last section discusses the implications and provides a summary.

THE INTENTIONALITY ISSUE

In order to detect fraud, one must assume that the auditor can distinguish between intentional and unintentional misstatements. This assumption is implied by AICPA (2005: section AU 316.05 (*SAS No. 99*)); *CICA Handbook*: section 5135, and the new *ISA No. 700* audit reports, at least for material misstatements. However, these standards also recognize that an audit is not designed to determine intent (e.g., AICPA, 2005: section AU 316.05, footnote 4). The problem seems to arise from the fact that fraud falls under the Criminal Code and can only be proven in a court of law with its own burdens of proof, evidence rules, and related reasoning that differ from those of generally accepted auditing standards (GAAS). These differences help explain why fraud examination and forensic accounting have developed as new specialties within the profession (e.g., see Brooks and Labelle, 2006 for an overview).

Financial statement auditing standards have adapted some of the ideas of forensic accounting, and these are incorporated in *SAS No. 99* and the *CICA Handbook* section 5135. Key ideas are that there is no longer a presumption of auditee management honesty for the forensic-type fieldwork stage (e.g., for revenue recognition there is a "rebuttable" presumption of a fraud risk per PCAOB, 2004) and that auditors must now specifically identify the risk of material misstatement due to fraud and consider the three specific fraud risk factors of incentives/pressures, opportunities, and attitudes/rationalizations. Economists have similar concepts that they characterize as economic, social, and moral types of incentives, respectively (Levitt and Dubner, 2005: 21).

If the fraud risk assessed is greater than what is considered acceptable after performing the forensic-type procedures of *SAS No. 99*, then the auditor should inform the audit committee (or equivalent) and likely withdraw from the engagement, or drastically change his or her audit plan. In short, a much more extensive investigative engagement would be needed to determine the extent of the fraud if audit risk for the engagement were to be reduced to an acceptable level. Failure to obtain permission from the auditee to expand the

scope of the engagement this way would effectively result in a scope restriction that would not allow the auditor to reduce audit risk to an acceptable level. The auditor would not be in a position to know the extent of the fraud.

Prior research on fraud risk assessment (e.g., see Matsamura and Tucker, 1992; Bloomfield, 1995, 1997; Wilks and Zimbelman, 2004) has focused on evidence gathering for detecting fraud, using sampling theory and game theory as frameworks. Under these approaches, the auditor essentially determines the optimal (acceptable) level of detection risk for use in the current audit risk model (e.g., see Bloomfield, 1995: 73). Consistent with Allen et al. (2006: 158) and Anti-Fraud Guidance (2007: 17, 53), I propose a risk model that distinguishes between evidence-gathering risks for intentional and unintentional misstatements. Detection risk is one example of evidence-gathering risk.

More importantly, however, from the financial reporting literature we know that extremely serious frauds arise from inappropriate reporting of forecasts used in accounting estimates. These types of fraud risks have not been considered in prior research, yet they are increasingly crucial in financial reporting and its evolving conceptual framework. The main contribution of this commentary is the integration of all these fraud risks to support an opinion on the overall fairness of disclosure in financial reporting. Gathering sufficient appropriate evidence is just one part of the process — a part of the process that says little about the appropriateness of the accounting and financial reporting disclosures.

Relevance and reliability in financial reporting ultimately relate to the trustworthiness of the reported numbers. These numbers cannot reflect economic reality unless they are free of the biases of the preparers of the financial statements (e.g., see Benston et al., 2007: 230–4; Maines and Wahlen, 2006: 412–3). The risks presented by these potential biases seem to have been traditionally understated in accounting theory.

Fraud can affect all the audit assertions. Because the auditor must be able to identify the risk of material misstatement due to fraud, the auditor must be able to distinguish this from the risk of unintentional material misstatements. A primary finding of the Allen et al. (2006: 158) review of the literature is that "fraud risk assessments are enhanced by considering fraud risks separately from misstatements due to error". Hence, a risk model that distinguishes these risks may be an important improvement on current standards.

In this paper I expand the model and logic discussed in Smieliauskas (2007) by incorporating the distinction between intentional and unintentional misstatements. If, during the audit, the risk of material misstatement due to fraud is represented as PMM_I (e.g., as assessed through use of the fraud triangle to assess fraud risks and related forensic procedures recommended in *SAS No. 99*), and the risk of unintentional material misstatement is represented as PMM_U, then it can be shown that the overall probability of material misstatement (PMM) is as given in (1). That equation has been set up to give the highest prominence to the risks of fraudulent reporting.[2]

$$PMM = PMM_I + [(1 - PMM_I) \times PMM_U] \quad (1).$$

A significance of (1) is that it makes clear that PMM can never be less than PMM_I. In other words, the total probability of material misstatement is always greater than or equal

to the probability of intentional misstatements. This formula makes explicit the concern of Benston et al. (2007: 232) that detecting deception in financial reporting is an important component of the stewardship objective and should be a more prominent feature of the evolving conceptual framework of financial reporting. Hence, PMM_I for each accounting measurement, including accounting estimates, must be reduced to some acceptable level before the auditor can successfully complete the engagement. Either that or auditors can assume, as they have since the 1930s, that $PMM_I = 0$ unless the audit indicates to the contrary. When auditors can no longer automatically make a presumption of management's honesty, then the type of benchmarks used in identifying PMM_I play an influential role, as discussed in the next section.

With sufficient evidence on the facts along with the framework proposed here, it is possible to make PMM_I as low as desired for the numbers recorded in the financial statements. However, this also means that not all numbers are acceptable for financial reporting. So reduced *PMM*s ultimately mean that there could be major restrictions on what can be reported as measurements in financial statements. In summary, my framework is set up so that fairness of presentation means to disclose the *PMM*s appropriately (e.g., through appropriate accounting estimates and measurements and the accompanying note disclosures). The details follow.

One important detail is that if $PMM_I = 0$, then $PMM = PMM_U$ in (1). The *PMM*s follow the rules of probability so that the maximum value *PMM* can take is 1.00. Thus, if PMM_U is allowed to get too high, the effect of intentional misstatements on *PMM* can be quite limited. At the extreme, if PMM_U is allowed to reach 1.00, then any accounting estimate is acceptable and fraudulent reporting is indistinguishable from nonfraudulent reporting. Similarly, high levels of PMM_U make it relatively easier to hide fraudulent reporting. For example, using (1), if $PMM_U = 0.90$ is considered an acceptable level of unintentional misstatement risk, then a very high intentional misstatement risk of $PMM_I = 0.90$ increases overall *PMM* by only 0.09 to 0.99. Thus, the significance of a low PMM_I is reduced if PMM_U is permitted to get very high. Or, to put it another way, when PMM_U is very high, intentional misstatements have minimal impact on *PMM*. Moreover, these same relationships hold for the accounting and auditing component risks of the *PMM*s that I discuss later.

I address the issue of fair presentation by relating it to how misleading the presentation is. This is consistent with the SEC concept of fair presentation (McEnroe, 2005) as well as with the evolving conceptual framework of financial reporting (FASB/IASB, 2006: 42). I operationalize "misleading" by relating it to *PMM*, thereby making fairness

2. The presumption underlying all the formulas in this paper is that reliability theory is a reasonable way of modeling the reliability concepts of auditing and accounting. This has been recognized for a long time in the audit literature (e.g., see Cushing and Leobbecke, 1983) but only recently has reliability modeling been expanded to also incorporate the accrual accounting concept of forecast error. Estimation uncertainties of IFAC (2008: para. 7–20) are consistent with the forecast-error concept. The robustness of reliability theory is perhaps best illustrated by the fact that it has been proposed for use in analyzing system performance in engineering and many forms of natural-language arguments, including in professional fields such as law, management, accounting, and auditing (e.g., see Walton 1996: ch. 4, 5).

dependent on the level of *PMM* that is acceptable (i.e., making *PMM* appropriately low for accounting measurements).

Auditing standards throughout most of the 20th century focused on providing assurance on unintentional misstatements or errors (PCAOB, 2004: 1–9). Hence, for many decades, standards virtually ignored PMM_I. This in part gave rise to the separate specialty of forensic or investigative accounting, which can be viewed as focusing on PMM_I. If, during an engagement, the forensic accountant can show that PMM_I is very high (or very low) before any correcting entries, that may be sufficient to meet the burden of proof for the engagement (e.g., to report to the audit committee or equivalent, providing grounds for dismissal of an employee, or, with sufficient fraud examination evidence, assisting in the possible prosecution of the responsible party for violation of the Criminal Code). In the traditional financial statement audit, the burden of proof was referred to as planned audit risk. The auditor has a duty to gather sufficient appropriate evidence so that audit risk is at or below the planned level. Smieliauskas (2007) shows how the planned audit risk relates to *PMM*. I discuss the implications of this for fraud detection.

SAS No. 99 can be viewed as putting more explicit stress on evaluating PMM_I on every financial statement audit engagement, at least for revenue recognition accounting (see AICPA, 2005: section AU 316.41). PCAOB (2004: section 14) suggests that if PMM_I is "remote", the "rebuttable presumption" of *SAS No. 99* has been overcome by the evidence. As discussed above, however, the significance of having a low PMM_I is reduced if PMM_U is allowed to get too high. This illustrates the importance of addressing the auditing and accounting risk components of both intentional and unintentional misstatements by standard-setters.[3] By combining PMM_U with PMM_I, (1) creates a more formal link between the new procedures of *SAS No. 99* and traditional auditing. Also, PMM_I is the risk of fraud that auditors are obligated to consider in the *ISA No. 700* audit report.

Brief Review of Past versus Future Distinction in Audited Financial Reporting

Smieliauskas (2007) has proposed an estimate of the total risk, *PMM*, associated with audited financial reporting. *PMM* reflects audit risks (*AudR*) that relate to misstatements of fact (audit misstatements), and accounting risks (*AccR*) that relate to forecast errors in accounting estimates (accounting misstatements). Audit misstatements can be corrected with perfect accuracy when detected (e.g., arithmetic accuracy errors, missing cash or inventory). Audit misstatements correspond to Glover et al.'s (2005) "facts" with no uncertainty because they are past events for which audit evidence is available to substantiate the facts at the point of the auditor's report decision.

Accounting misstatements, on the other hand, do not have this certainty-of-correction-on-detection property that misstatements of fact have because accounting misstatements relate to forecast errors resulting from future events. No one can predict the future with

3. Just as Smieliauskas (2007) shows that having low audit risk does not guarantee low *PMM*, having a low PMM_I does not guarantee a low *PMM* either.

certainty. This characterization of misstatements and related risks — one related to predicting future events (*AccR*) and one related to all other uncertainties (*AudR*) — helps structure judgement and theory on the basis of highly distinctive characteristics. For example, the newly revised *International Standard on Auditing* (*ISA No. 540*) relating to audits of accounting estimates and fair values puts much more emphasis on what it calls "estimation uncertainty" (IFAC, 2008: paras. 7, 10). *AccR* seems to be the dominating feature of this estimation uncertainty concept. Audit risks relate primarily to the examination standards of GAAS (referred to as standards of fieldwork by the AICPA), whereas accounting risks relate solely to the audit reporting standards of GAAS.

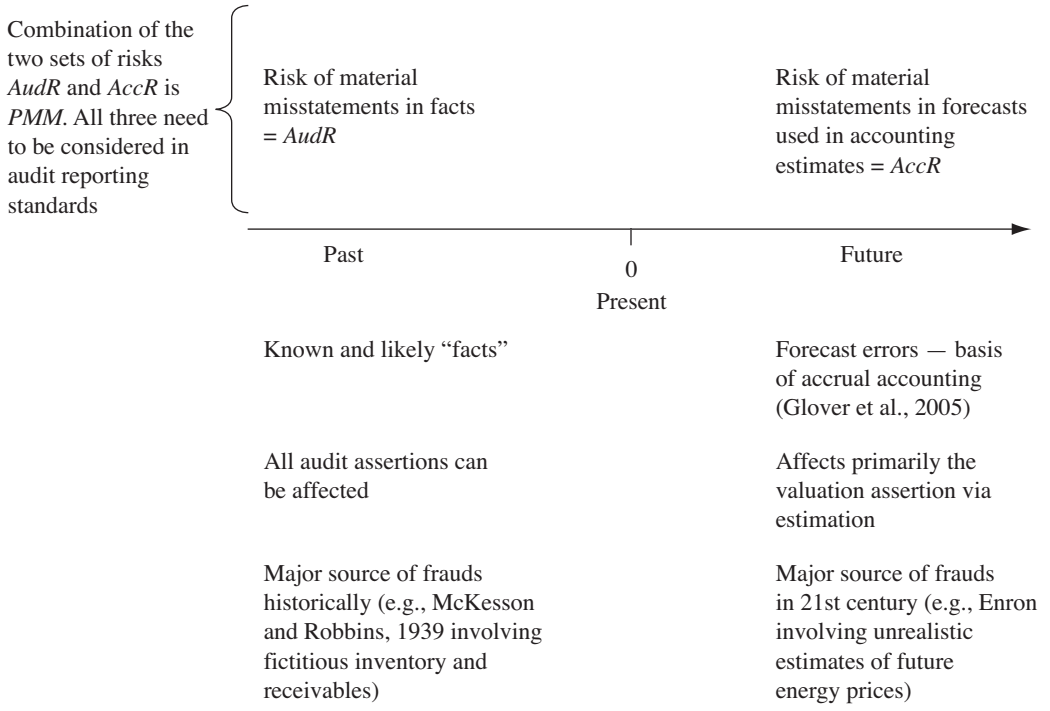
The chief distinction between *AccR* and *AudR* is that the former reflects uncertainty about the future, whereas the latter relates to uncertainties about the past (e.g., incomplete evidence or records). This is the basis of the fundamental distinction between audit and accounting deficiencies in audit report reservations.[4] Figure 1 provides a graphical representation of the logic. *PMM* reflects the auditee business risks to the extent that these risks are reflected in the facts, accounting estimates, and note disclosures in the financial statements.

Figure 1 can be viewed as a two-stage process reflecting the two-part role suggested by GAAS reporting standards. First, the auditor determines whether the evidence available is sufficient to establish the facts of the auditee's situation (i.e., whether the amount of evidence is acceptable to form an audit opinion). Second, the auditor determines what the appropriate disclosures should be via financial reporting given the facts (i.e., the financial statements should present fairly in accordance with GAAP on the basis of the available evidence at the time of the audit report decision). This two-stage process naturally follows from the two major categories of GAAS report reservations: (a) audit scope limitations (represented by step 1), and (b) accounting deficiencies (represented by step 2). Implicit in an unqualified audit report without reservation is that neither of these two stages is deficient.

Figure 1 outlines the crucial facts-versus-forecast distinction of accrual accounting and how this distinction affects auditor risk assessments (e.g., see Glover et al., 2005). Here I treat the auditor's forecast distribution as a "fact", whereas a single point estimate from this distribution for use in financial reporting is a "forecast" in making an accounting estimate. This is because while a distribution of future events may be known, the actual realization of the possible states of the world is not known at the time of the audit report decision. So I use the convention here that facts reflect what is known while forecasts and

4. One reason we can be confident of the importance of this distinction is that it is the basis of the way the human mind works and is reflected in the fundamental distinction of the past and future tenses of human language (e.g., see Pinker, 2007: 193–218 for a summary, and note that on page 193 he uses a time-line similar to Figure 1). In logic, it is also recognized that the validity of inferences is closely tied to language and the relationships of statements to one another as determined by a finite set of linguistic rules that have evolved in the human mind (Priest, 2000: 6, 20). Figure 1, however, is limited to the reasoning used in audits of financial statements. Of course, most future events are conditional in many ways to what has already happened in the past and this is why facts are so important in developing forecasts. However, there still can remain large uncertainties regarding forecasts of future events. This conditional independence is presumed to already be reflected in the forecast-error distribution.

FIGURE 1 Overview of concepts



predictions used in financial reporting reflect point estimates from the range of future possibilities. This is consistent with professional guidelines such as AuG-41.

Note that a factual misstatement can arise from a misinterpretation of the facts and lead to an incorrect accounting estimate (e.g., see CICA, 2008b: section 5135.005). However, material factual misstatements are captured by the audit risk concept because implicit in the current audit risk model is that detected material factual misstatements are always corrected. Otherwise, uncorrected material factual misstatements lead to $AudR = 1.00$ because the audit is ineffective in correcting known, identified, material, factual misstatements. Because auditors never plan $AudR = 1.00$, this means that in audit planning all detected material factual misstatements are appropriately disclosed (either through adjustments in financial reporting or, if the auditee fails to correct, as an accounting deficiency reservation in the auditor's report). *AudR* thus reflects undetected factual misstatements and corresponds to the risk that the audit evidence fails to detect material factual misstatements.

GAAS reporting standards require that material, uncorrected, factual misstatements are disclosed as a type of accounting deficiency reservation in the auditor's report. But accounting deficiencies also include inappropriate disclosures of forecast errors via accounting estimates. This is a unique role of accounting risk (*AccR*) in GAAS reporting standards as noted by the influential Cohen commission report (Cohen, 1978). Thus, GAAS

reporting standards can be affected by either misstatements of fact or misstatements due to forecast error. In other words, the representational faithfulness concept of accounting theory needs to incorporate the facts as well as the forecasts that may be used in financial reporting.

In order to avoid double counting of misstatements in distinguishing the past from the future, I use an important definitional distinction as follows: a forecast-error distribution on which *AccR* is based is presumed to not reflect misstatements of fact because such misstatements are already captured by the *AudR* concept. In other words, *AccR* is conditional on the facts available to the auditor at the time of the audit report decision. This is consistent with Mautz and Sharaf's (1961: 110) observation about the auditor's "reality" at the time of the audit report decision, as well as with the concept of estimation uncertainty in IFAC (2008: section 9). The double counting of misstatements problem is important, in part because it is related to the problems associated with distinguishing the past from the future noted in Barth (2006: 276–7).

By the above discussion, auditors should consider in accounting deficiency reservations in the auditor's report any uncorrected, material, factual misstatements detected in the assessment of *AudR* (e.g., accounting adjustment for fictitious cash or inventory recorded by the auditee). In addition, auditors need to consider as possible accounting deficiencies any improper disclosure of forecast errors in accounting estimates that arise independently of any factual misstatements in their assessment of *AccR*. This is the *AccR* concept I use to identify fraudulent forecasts in the rest of this paper.

The point is that fraudulent *AccR*s are independent of factual misstatements because factual misstatements are treated as a separate category of accounting deficiency. Thus, fraudulent reporting based on fraudulent forecasts deals strictly with the way point estimates are made from a forecast-error distribution, not from the factual misstatements that can change the forecast-error distribution. This makes a sharper distinction between accounting and auditing concepts of misstatements noted in Smieliauskas (2007: 350). This distinction is important because it helps make the forecast-errors-based accounting misstatements concept more consistent with the economic risk management literature discussed later in this commentary.

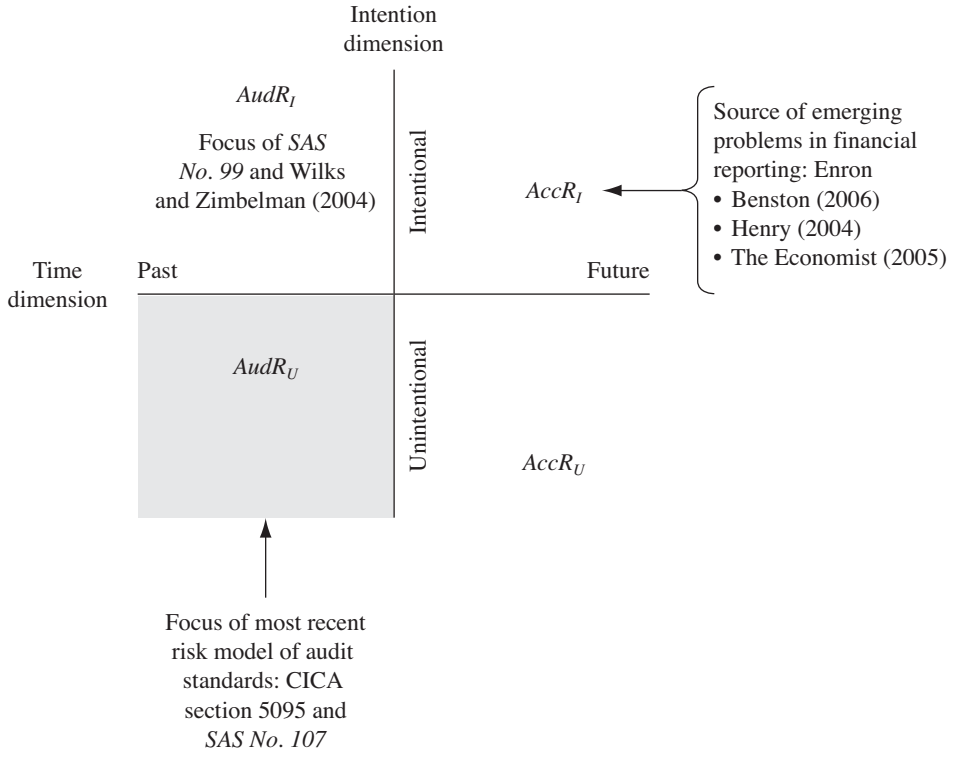
Figure 1 and the related formula in Smieliauskas (2007) — see (6) below — show that if the acceptable risk of future uncertainties (i.e., forecast-error risk, *AccR*) is allowed to get too high, this is equivalent to having no audit in terms of probability of material misstatement (*PMM*). That is, if either *AudR* or *AccR* or both are very high, so is *PMM*. This is the major reason that auditors need to be concerned about accounting risks — low *AudR* in an environment of high *AccR* in financial reporting may do little to reduce *PMM*. In other words, an audit may not add much value if accounting risks are allowed to get too high.

The Intentionality Dimension

The facts-versus-forecast distinction of financial reporting and auditing sets the stage for considering two major categories of fraud: fraud associated with misstatement of facts and fraud due to misleading forecasts. Figure 2 adds the intentionality dimension to the Figure 1 framework.

FIGURE 2 The quadrants of audited financial reporting uncertainties

The four major categories of uncertainties in accounting and auditing: A combined accounting/auditing conceptual framework may be the only way to address fraudulent reporting.



The logic here is that each of the quadrants of Figure 2 reflects a different type of misstatement and its associated risk. There are misstatements of fact (e.g., recording fictitious inventory) and misstatements in forecasts (e.g., predicting the collectability of receivables). Factual misstatements can be unintentional (i.e., random errors) or intentional. However, one can also visualize forecast errors that might be intentional or unintentional. If we can assume that each of these four types of misstatements are independent of one another (past versus future, and intentional versus unintentional), at least as a first approximation, then some fairly straightforward and flexible risk relationships can be identified using (1).[5] These independent risks can be summarized as different quadrants of a risk plane, such as in Figure 2. Figure 2 indicates that the four risk categories associated with these misstatements provide a concise way of summarizing the evolution of standards.

5. Probably the most controversial feature of the model, and the expansions proposed here, is the assumption that the risks are independent. This should be at least a plausible assumption in most cases, because client business risks that lead to accounting uncertainties are largely independent of the audit opinion. In the few cases that independence may be significantly violated, the auditor may need to modify the risks so that they are explicitly conditional probabilities. Such refinements are left for future research.

Figure 2 also indicates that the new, more sophisticated frauds of the 21st century are likely to arise from the increasing need to make estimates involving forecasts. This explains the increasing need to focus on accounting risks as a broad concept underlying virtually all rule-based accounting systems that result in the recognition of an asset or a liability for financial reporting purposes. If we cannot anticipate intentional forecast errors and figure out a conceptual way of identifying them, then GAAP itself, which traditionally has relied quite a bit on good-faith estimates, can become a fraud risk factor. This is why the next section attempts to get a better conceptual handle on the relationship between intentional and unintentional forecast errors.

Independence of the risks means flexibility in the way that the risks can be represented and reorganized. For example, independence of the risks means that Figure 3 is equivalent to Figure 4 in the way that the risks can be viewed. This flexibility in viewpoint also means that the risks can be combined in ways most appropriate for planning and supporting the audit opinion, or in guiding preparers of financial statements to minimize the risks of fraudulent reporting. This flexibility is reflected in the system of equations consisting of (1) and the following:

$$PMM_I = AudR_I + [(1 - AudR_I) \times AccR_I] \quad (2),$$

$$PMM_U = AudR_U + [(1 - AudR_U) \times AccR_U] \quad (3).$$

Moreover, (1), (2), and (3) can be shown equivalent to the following system of equations:

$$AudR = AudR_I + [(1 - AudR_I) \times AudR_U] \quad (4),$$

$$AccR = AccR_I + [(1 - AccR_I) \times AccR_U] \quad (5),$$

$$PMM = AudR + [(1 - AudR) \times AccR] \quad (6).^{6}$$

This set of equations is useful in helping the auditor decide when sufficient forensic and normal audit procedures in combination have been obtained per *SAS No. 99* (using (4)), and whether the accounting risk from intentional as well as unintentional misstatements is at acceptable levels as implied by Benston et al. (2007) (using (5)). That equation will be critical in understanding the full scope of the problem posed by fraud risks in accounting estimates.

The *AudR* formula, (4), explicitly represents that evidence gathering has to consider the impact of intentional and unintentional factual misstatement detection procedures in deciding how much assurance is provided by an audit engagement. For example, Benford's law is used to detect systematic unusual patterns in record keeping and is primarily geared to detecting intentional factual misstatements (Anti-Fraud Guidance, 2007: 33). So, if $AudR_U$ is, say, 0.05 and $AudR_I$ is "remote", the total level of assurance provided by

6. Smieliauskas (2007: 358) is the source of (6).

FIGURE 3 Types of audited financial reporting uncertainties: Focus on intentionality

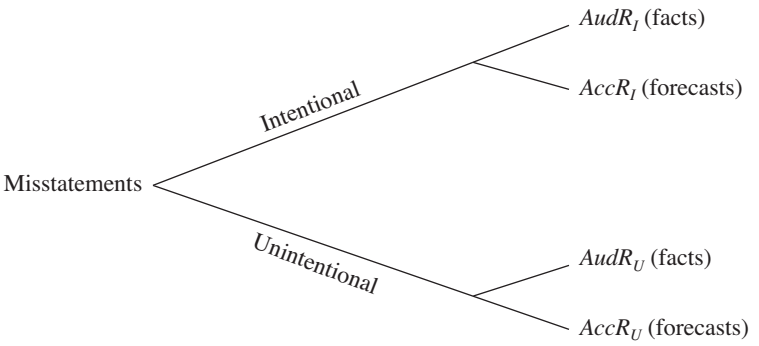
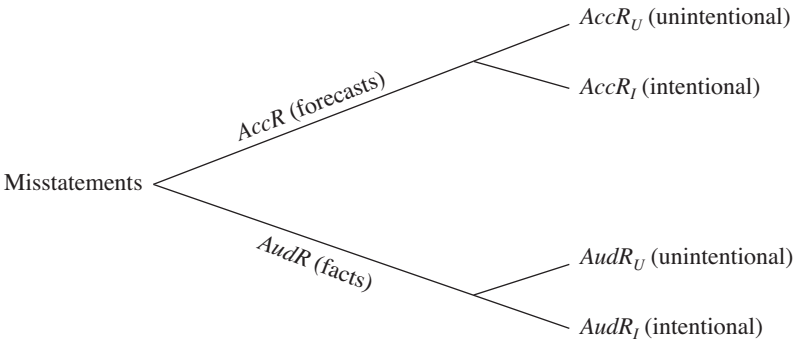


FIGURE 4 Types of audited financial reporting uncertainties: Focus on facts versus forecasts



forensic as well as traditional audit procedures is given by $1 - AudR$, where $AudR$ is given by (4). Note also that both $AudR_I$ and $AudR_U$ can be decomposed further into the traditional audit risk model components of inherent risk, control risk, and detection risk (e.g., as discussed in PCAOB, 2005). For example, for $AudR_I$ there would be an inherent risk assessment for intentional material misstatements, a control risk assessment for intentional misstatements, and a residual risk assessment for intentional material misstatements per Anti-Fraud Guidance (2007: 53). Of course, any risk model is only as good as the auditor's risk assessment, but the trend in audit standards seems to be toward risk-based auditing (e.g., see Bloomfield, 1997: 536).

The real advantage to these equations is that the most critical risks and their relationships with one another have been made explicit. Thus, for example, the external auditor may want to use the work of the specialist forensic accountant to help assess PMM_I (per *CICA Handbook* section 5135 and *SAS No. 99*), and integrate that with "normal" audit procedures to control overall *PMM*, using (1). Allen et al. (2006: 158) suggest that such separation in assessments results in superior fraud detection capabilities.

I leave further refinement of the evidence-gathering risks (*AudR*) for future research. In the remainder of this paper I switch focus to the risk that has potentially tremendous implications for financial accounting theory and GAAP, that of *AccR* using (5).

MAKING OPERATIONAL INTENTIONALITY IN ACCOUNTING RISKS VIA THE USE OF BENCHMARKS BASED ON ACCEPTABLE RISK LEVELS

In this section I focus on analyzing the effects of fraudulent financial reporting on *AccR*. This requires a benchmark or reference that indicates when estimates are fraudulent. Such benchmarks determine how to report a forecast-error distribution once it is known. The *AccR*s discussed here are influenced by the interaction of the forecast-error distribution, the estimate proposed by the auditee, and the benchmark used by the auditor.

The logic of hypothesis-testing decision making using acceptable risks as the decision criterion can provide useful guidance to accounting principles when dealing with accounting uncertainties. Under this reasoning system, if the *AccR* associated with the proposed reported amount for an asset is less than or equal to the acceptable level, the proposed reported amount will be considered to result in fair presentation when recorded for financial reporting purposes.[7] Otherwise, the reported amount is to be rejected by the auditor. FASB (2006: vi) has identified consistency in reasoning as a fundamental goal in the conceptual framework for financial reporting. Here, I presume that such consistency needs to be extended to the verification of the resulting accounting estimates.

The system of reporting outlined in the preceding paragraph can be viewed as a risk-based reporting system. The reasoning is consistent with that of risk-based auditing standards. Because these standards are evidence-based and the reporting system is consistent with that of evidence-based reasoning, one can also characterize the reporting system as evidence-based. Such an evidence-based accounting theory concept is not new — Paton and Littleton (1940: 18–21) first proposed something like it almost 70 years ago. This was well before audit standards became risk-based. Thus, the distinctive reasoning process for financial reporting outlined here can also be referred to as an evidence-based accounting theory (EBAT). I will henceforth refer to this reporting logic as EBAT. The next section shows that EBAT seems to provide a succinct explanation of much of the reasoning process of current financial statement reporting. EBAT is consistent with the increasingly influential economic risk management literature in finance. EBAT also means that auditee business risks in audited financial reporting are addressed by appropriate GAAP, not just by sufficient evidence gathering.

In order to better understand the following, it is important to be aware of the relationship of intentional and unintentional risks to the aggregate risk as reflected in (4), (6), and especially (5). In particular, as discussed with (1) above with respect to intentional forecast errors as reflected in $AccR_I$ of (5), such intentional misstatements are easier to hide if $AccR_U$ is allowed to become very high. Thus, the acceptable level of $AccR_U$ is a very

7. I will tend to focus on accounting for assets in this paper, since assets have conceptual primacy in the evolving framework of financial reporting (FASB/IASB, 2005, 2006).

important issue for accounting standard-setters if they wish to limit the potential for GAAP to be a fraud risk factor. Specifically, exclusive focus on $AccR_I$ will not necessarily reduce *AccR* in (5) to acceptable levels.

Importance of Benchmarks

The main purpose of a benchmark in fraud detection is to act as a sign so that when there is significant nonconformity with the benchmark, the risk of intentional misstatement is increased. The degree of nonconformity is determined by the nature of the benchmark for *AccR*, as elaborated below.

Figures 5 and 6 reproduce Figures 1 and 3, respectively, of Smieliauskas (2007). These figures illustrate the accounting risk possible when "reasonable" accounting estimates of auditing standards follow (specifically, the illustrations in CICA, 2008b; AuG-41; AICPA, 2005: AUI section 312.07). Under these guidelines, a misstatement occurs from the nearest edge of a reasonable range (their illustration is a range of 130K to 160K). Thus, if, as in their illustration, the auditee wants to record 110K, the 20K difference from the nearest edge is considered a misstatement for the estimate. If I make the same assumption as in Smieliauskas (2007) about materiality for this illustration (15K), and the underlying forecast-error distribution (uniform over the range 130K to 160K), then the *AccR* for recording the 110K is 1.00 — that is, unacceptable. The *AccR* remains 1.0 until the estimate of 115K is reached, at which point it would start reducing the closer management's estimate is to the mean of the uniform at 145K (where $AccR = 0$).

The issue I am raising in this section is, when should the *AccR* be considered intentional and therefore part of the risk of fraud? Or, to put the issue another way, how much of the *AccR* is $AccR_I$ and how much is $AccR_U$? This question must be addressed if the auditor and accounting standard-setters are to take responsibility for deterring fraud. This is why the concept of a benchmark is crucial. If the benchmark is considered to be the entire reasonable range, as current audit standards suggest, then this is an example of a vague benchmark. With such a benchmark, it would be reasonable to assume that all *AccR*s within the range are considered unintentional. This means that *AccR* up to 0.50 is unintentional because that is the highest *AccR* within the range (at the edge point — see Figure 6). But then any estimate outside the range would most reasonably mean that the misstatement is intentional.[8] This definition means that $AccR_I$ will be zero at the benchmark, experience a jump to a level beyond acceptable $AccR_U$ outside the benchmark, and experience a further increase the further the auditee accounting estimate is from the benchmark. The more precise the benchmark, the greater its discriminating ability to detect fraudulent estimates (e.g., this is consistent with the SEC's *SAB No. 99*: 7 position that intentional immaterial misstatements are unacceptable). This greater discriminating power may be reflected by a

8. The logic here is similar to AuG-41 for misstatements that are "not reasonable". Now I ask the reader to consider that if such a known misstatement were pointed out to the auditee and the auditee failed to correct such a misstatement, does that make the misstatement intentional? Here I assume that it does. This is consistent with Anti-Fraud Guide (2007: 22). Also see the discussion later in the paper.

FIGURE 5 Illustration of logic of audit misstatements concept: AuG 312.07 or AuG-41.30

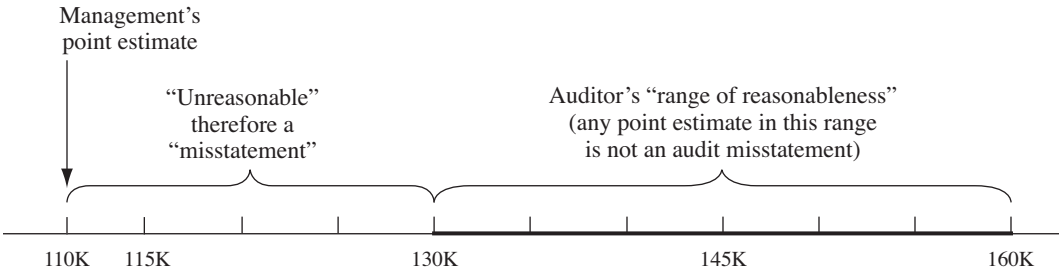
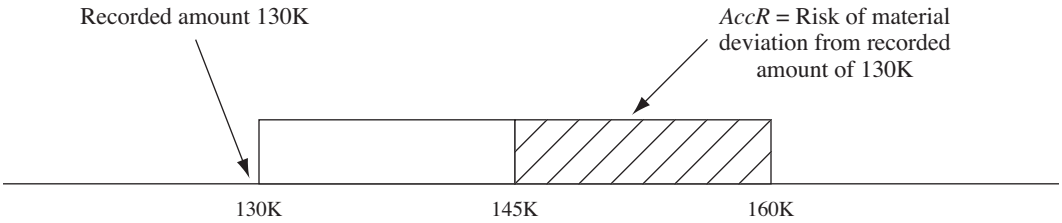


FIGURE 6 Accounting risk (*AccR*) made explicit in AUI 312 and AuG-41: Example



Example: Inherent risk can be anything, but *AccR* = 0.5

smaller jump or even a gradual increase of $AccR_I$ from zero, depending on the forecast-error distribution.

In summary, for the AuG-41 example, *AccR* increases from zero to 0.50 within the range, and outside the range *AccR* continues to increase the further away the estimate is from the reasonable range until it reaches a maximum at 115K and stays at this maximum for any estimate below 115K (or above 175K). Note that this illustrates that basing decisions entirely on acceptable levels of *AccR* can give results consistent with intuition, yet the logic is quite straightforward numerically. With these assumptions using the AuG-41 illustration, the implied acceptable level of *AccR* is 0.50. Or, equivalently, the acceptable level of 0.50 determines the reasonable range. Now imagine such logic applied to any forecast-error distribution. Such logic would tell us how to compute benchmarks for forecast errors to detect fraudulent reporting, and at the same time tell us when there is too much uncertainty to record assets and liabilities for financial reporting purposes (e.g., the width of the reasonable range is too wide). These definitional distinctions are necessary to make (5) operational and yield results consistent with intuition.

What Is a Fraudulent Forecast?

When is a forecast fraudulent? As the reader can imagine, answering this question is one of the most difficult challenges in fraud detection, because excluded from forecasts are intentional misstatements of fact, as discussed in the preceding section (e.g., excluded

from the fraudulent estimate of the allowance for doubtful accounts are any fictitious receivables so that the fraudulent estimate is based on actual receivables). The solution proposed here is the use of appropriate benchmarks based on acceptable levels of *AccR*. An advantage of explicitly considering *AccR* in reporting decisions is that *AccR* provides a framework for analyzing the effects of different concepts of benchmarks for their ability to detect fraud. For example, assume that, instead of the rather broad benchmark of the reasonable range of (130K, 160K), the auditor was willing to be more precise and identified the mean of the distribution as the single best estimate (examples of such strategies have been reported in practice, e.g., Henry, France, and Lavelle, 2005: 94).

The impact of using as the benchmark the mean of 145K is that *AccR* goes to zero at this benchmark. If the acceptable level of *AccR* were zero, then 145K would be the only value that would be acceptable for recording on the financial statements. This represents an ideal case of minimizing risk of material misstatements from forecast errors.

Normally, the only asset account with zero forecast error would be cash (e.g., see Glover et al., 2005). So, in the most general sense, a nonzero acceptable *AccR* would be associated with the benchmark. A nonzero *AccR* in accrual accounting would normally apply to all types of benchmarks. It's clear, however, that the highest *AccR* within a benchmark should not be higher than what is considered acceptable. In fact, why not let this be the chief criterion for determining the benchmark? This would be applying EBAT logic to determining the benchmark. This way, any deviation from the benchmark can be considered "unreasonable" and the logic would be similar to AuG-41 guidance. Furthermore, if the auditee would refuse to correct such an "unreasonable" estimate and the auditee could not provide a persuasive justification to the auditor, then the auditor could make a legitimate claim (e.g., by using the reasoning of the SEC's *SAB No. 99*: 7–8) that the resulting misstatement is intentional. Thus, the risk associated with an uncorrected and "unreasonable" estimate is $AccR_I$. Further extensions of this reasoning would consist of taking into account the total *AccR* associated with the auditee's estimate and its relationship to the acceptable level of *AccR*. Such an EBAT system of reasoning would have several general properties, which can be summarized as follows.

First, all *AccR*s within a benchmark are unintentional by definition (i.e., $AccR_I$ within the benchmark equals zero). Second, $AccR_U$ associated with the benchmark is treated as a type of unavoidable risk associated with accounting estimates involving forecasts, and therefore apply to all accounting estimates.[9] Thus, total *AccR* is given by (5) but within a benchmark $AccR_I = 0$, and outside the benchmark the $AccR_I$ is nonzero, as discussed in the preceding paragraphs. However, the acceptable $AccR_U$ value always appears in (5) for every estimate. This is because, just as the acceptable $AudR_U$ in the current audit risk model is the planned level of risk associated with traditional audit procedures, $AccR_U$ is

9. A benchmark may have *AccR*s below the acceptable level — for example, if the reasonable range of AuG-41 is used as the benchmark, then acceptable *AccR* is 0.5 — but *AccR* could get as low as zero with this benchmark. A good convention appears to be to use the maximum acceptable $AccR_U$ as the risk associated with the benchmark. This is consistent with the way planned *AudR* is the maximum acceptable *AudR* used in the traditional audit risk model. This is the convention I use in this paper for $AccR_U$.

the planned level of *AccR* for the accounting estimate so that it is not excessive or "significant" (e.g., this is consistent with IFAC, 2008: A-50).

These conventions associated with the benchmarks mean that $AccR_I$ can jump from zero at the benchmark to greater than or equal to the acceptable $AccR_U$ just outside the benchmark, as illustrated in the AuG-41 example. In general, the size of the jump is a function of the vagueness of the benchmark; the vaguer the benchmark, the greater the jump in $AccR_I$ from zero within the benchmark to a value higher than $AccR_U$ for an accounting estimate outside the benchmark. This jump is determined by the forecast-error distribution. The intuition behind this is that if the benchmarks are very loose and management still manages to not conform with them, then the risks that management's misstatements are intentional can be viewed as greatly increased. This intuition seems to be used by the SEC in its enforcement actions (e.g., see Dechow, Ge, Larson, and Sloan, 2007: 5). Vaguer benchmarks (such as wider ranges of reasonableness) mean that higher *AccR*s are deemed acceptable, meaning that the risks of fraudulent reporting ($AccR_I$) are higher outside the benchmark. Also, loose standards make it more difficult to detect intentional misstatements. For example, Nelson, Elliott, and Tarpley (2002: 177) provide some evidence that the vaguer the benchmark, which they refer to as imprecise standards, the easier it is to manage earnings that are being audited.

Note the effect of using a more precise benchmark such as the exact value of 145K instead of the range 130K to 160K as in the original AuG-41 example; many more estimates are treated as intentional misstatements with the more precise benchmark. How many depends on the relationship between the benchmark chosen and the underlying forecast-error distribution. In particular, the variance of the distribution can have a large effect as well as any extreme values associated with the distribution. Thus, what is considered intentional is a function of the benchmark used and its interaction with the forecast-error distribution. In particular, excessively vague benchmarks can make it more difficult to detect fraudulent reporting based on fraudulent forecasts. Vague benchmarks also make detection of fraudulent reporting less relevant. This is because vague benchmarks are associated with high $AccR_U$s, and therefore the impact of $AccR_I$s on overall *AccR* is reduced.

Assets are considered to have "conceptual primacy" in the evolving conceptual framework of financial reporting, and are supposed to be "probable" in realization (e.g., see FASB/IFAC, 2005, 2006 and note how *AccR* ties in directly to the definition of the existence of the asset concept). It is easy to come up with examples of high variance distributions that raise questions about whether any estimates are reliable enough to be recorded as assets. For example, in the AuG-41 example, assume a uniform distribution over the interval 100K to 400K — that is, the distribution completely envelops the original range of reasonableness (130K–160K). For this forecast-error distribution $AccR_U = 0.90$ and $AccR_I = 0.90$ throughout almost the entire interval, even well outside the range of reasonableness. *AccR* then equals 0.99 by (5). In other words, all estimates result in a very high risk of fraudulent reporting. Another way of thinking of this is that no recorded estimate is acceptable or justifiable. This helps explain the arbitrariness concept of classical accounting theory (e.g., see AAA, 1971: 22 for a definition and implications of arbitrary measures).

Near the opposite extreme, when the variance of the forecast-error distribution is very small, especially relative to materiality, then accounting misstatements begin to resemble

known audit misstatements. At the extreme of $AccR = 0$, *any* misstatements are audit misstatements because there is no uncertainty regarding the future with the accounting measure and therefore all misstatements are factual ones. Note that this does not necessarily mean that if $AudR = 0$ then *AccR* is also zero — there can be forecast errors even when there are no misstatements of fact.

An EBAT Analysis of a Classical Financial Reporting Controversy

To illustrate the problem of extreme values via forecasting errors, let me use the classical example widely referenced in the accounting theory literature (e.g., see Johnson, 1994: 37–9; Maines and Wahlen, 2006: 403). These and similar examples have proven to be controversial among accounting experts. The issue is when, if ever, a gamble or lottery represents an asset. Here I consider the additional issue of which type of reporting would facilitate fraud.

Imagine an "investment" that resulted in the following payoffs or future cash flows: $1,000,000 with probability 0.01 or zero payoff with probability of 0.99.

Also assume that this "investment" (lottery or gamble) will be held by the auditee until the payoff date (i.e., you can't assume that the asset will be sold before the payoff date).[10] If the auditee paid something for this asset, then this represents a real gamble by the auditee. The question is how should this lottery be recorded on the balance sheet date if the payoff date does not occur until after the audit report date?

This distribution of payoffs results in an expected value of $10,000 (one million $\times$ 0.01 $+ 0 \times 0.99$). But the probability of actually getting a $10,000 payoff is zero. The probability of getting anywhere near this expected value of $10,000 is zero as well. Suppose that we operationalize "near" as being less than a material amount and say that materiality is $1,000 for further concreteness; then, with the above assumptions, the probability of getting anywhere in the range of $9,000 to $11,000 is zero as well.

Recording a zero results in an $AccR = 0.01$ and recording a $1 million asset results in an $AccR = 0.99$. The focus of this section is how much of this *AccR* is intentional and how much is unintentional? Answering this question is the key to successful fraud detection in accounting estimates. For example, virtually everyone agrees that reporting this investment as a $1 million asset on the balance sheet does not result in presenting fairly the "asset". Many would even say that it is misleading if not fraudulent reporting, especially if large management bonuses were based on incomes resulting from recognizing such unrealized gains. (Prior research has not considered this potential for manipulation.) Or to perhaps make the issue clearer, consider how paying anything close to $1 million for such a lottery should be recorded. Should the debit go to an asset account? An expense account? A loss account? This is part of the problem when dealing with extreme values in forecast-error distributions.

10. Under EBAT the market value can be recorded at the time of the audit report date if the auditor is (1 − acceptable *AccR*) sure that the lottery ticket will be sold after the balance sheet date. Note how EBAT forces the required assumptions to be made explicit.

Assume that management recorded this asset on the financial statements at $1 million well before the payoff determination date, after paying something close to its expected value. Then the reported earnings would be increased by about $990,000, and as a result management rewards itself with, say, a bonus of $500,000 for making such a great investment. Many readers would probably feel that such a bonus is fraudulent. But on what basis can they argue that fraud is taking place?

EBAT reasoning would explain that the source of the fraud is recognizing the $1 million payoff as an asset. If acceptable *AccR* for this investment were set at, say, 0.05, then the only asset value acceptable is zero. In other words, there is no recordable asset here under EBAT. (The issue whether such a payoff possibility should be disclosed is discussed later in this section.) If, however, acceptable *AccR* were set at 0.99, then recording an asset of $1 million for this investment is acceptable (zero would also be acceptable, but the reader can imagine which acceptable estimate management would prefer). Allowing the recording of either extreme is a consequence of an extremely high definition of acceptable *AccR*. This illustrates that the higher the acceptable $AccR_U$, the more difficult it is to detect fraud (e.g., IFAC, 2008: paras. 15–21, A47–A51 have flagged such high-risk estimates as "significant estimation uncertainties").

But many readers, on seeing these potential economic consequences of allowing high *AccR*s in accounting estimates, might argue that such high-risk levels are unrealistic. If that is the reader's view, then the reader might want to reconsider why the expected value of $10,000 should be acceptable because it has an even higher *AccR* of 1.00. Yet the expected value is widely associated with fair value accounting (e.g., *expected* future cash flows; see Barth, 2006: 215 especially footnote 11). So why is fair value accounting considered realistic in this case but not the $1 million? This potential problem with using expected values for valuation is well recognized by portfolio managers in finance; some refer to it as the "flaw of averages". For example, see Savage (2003) and Savage and Van Allen (2002).

The point of this exercise is to show that acceptable *AccR* levels can be important for detecting fraud and therefore why this property should be considered when setting benchmarks. Note that an acceptable *AccR* of 1.00 means that *any* forecasted value is acceptable for financial reporting purposes, not just the $10,000. This also means that intentional and unintentional misstatements are indistinguishable. Thus, if expected values are to be prevented from being exploited to hide high-risk estimates (and thereby creating mispricing of risk problems as in the current credit crisis), then the risk effects as proposed here via EBAT or similar logic should be incorporated into financial reporting. This way, "present fairly" would really mean "less misleading" because the fairness concept would incorporate the objective of reducing the risk of being misleading to an acceptable level.

In terms of the effect on *PMM*, note that an $AccR = 1.00$ has the same effect as not having an audit (i.e., $AudR = 1.00$ has the same effect on *PMM* per (6)). It therefore would seem that a primary role of accounting standard-setters in maintaining the relevance of financial statement auditing would be to set as basic principles that reasonable ranges for accounting estimates be based on *AccR* as proposed here and not just on the materiality of the range. This is consistent with IFAC (2008: A48).

To illustrate the above properties, let me continue with the lottery ticket example. Under EBAT, the appropriate benchmark (B) for the lottery ticket situation is zero.[11] So, if we record zero for the lottery ticket, then $AccR_I = 0$ and $AccR_U = 0.01$ by definition. Using (5), $AccR = AccR_U = 0.01$. If we record \$10,000 and $B = 0$, then $AccR_I = 1.00$ and $AccR_U = 0.01$ so that $AccR$ by (5) is 1.00. If we record \$1 million but $B = 0$, then $AccR_I = 0.99$ and $AccR_U = 0.01$ so that $AccR = 0.9901$.

What these calculations illustrate is that the effect of introducing an appropriate benchmark is to make clearer when fraud is taking place. Thus, if the auditee wanted to record the \$1 million, we know that with $B = 0$ $AccR_I$ is a very high 0.99.

By definition $AccR = AccR_U$ when the recorded amount is the benchmark. So the $AccR$s in the original Johnson (1994) lottery ticket illustration can be viewed as unintentional misstatement risk, assuming that the various payoffs are treated as the benchmarks. This makes sense because when Johnson (1994) introduced this example, he did not distinguish between intentional and unintentional misstatements. The only way to do this is by defining a benchmark that is supposed to reflect unintentional misstatements.

Mathematically, the benchmark can be any value. It is up to the auditor/accountant to decide which benchmark makes the most sense using whatever principles and concepts he or she deems appropriate (e.g., to "present fairly").[12] Here I suggest the use of EBAT reasoning to set benchmarks based on acceptable risk levels.

For all forecast-error probability distributions the same EBAT logic applies. We need to identify an appropriate benchmark value for calculating unintentional misstatement risk ($AccR_U$) and combine that with any intentional risk $AccR_I$ associated with the actual value chosen by the auditee. This combination is achieved by using (5) to calculate the overall forecast-error risk, $AccR$, for an accounting estimate. Note that the calculation of $AccR_I$

11. The reader is encouraged to experiment with other benchmarks in this simple situation to see if different benchmarks are more or less capable of distinguishing between reasonably intentional and unintentional misstatements.

12. Recent research in behavioral economics is recognizing that in complex societies involving extensive cooperation and division of labor, social norms and emotions have evolved that encourage what is perceived to be a "fair" distribution of resources in particular circumstances. For example, see Sigmund, Fehr, and Nowak (2002). A sense of fairness is what seems to have helped humans to dominate the planet. Complex human societies are not possible unless fair playing has value. And this means the need to control free riders via a sense of fairness. In fact, recent research suggests that chimpanzees are more likely than humans to meet the assumptions of standard, rational, economic maximization theory because chimps don't seem to have a fairness constraint operating on them (e.g., see *The Economist*, 2007). Social norms are a primary means of maintaining justice or fairness (Hauser, 2006: 97–103). Social norms are rules and standards that limit behavior. In this sense a violation of a benchmark in financial reporting should be equivalent to a violation of an important social norm. Smieliauskas (2006) has suggested that there can exist an evolutionary sociocultural "arms race" between those engaged in misreporting (historically, the users of capital) and those wishing to detect such cheating (historically, the providers of capital). This arms race is reflected in the evolution of GAAS, GAAP, and associated regulatory regimes. The refined use of benchmarks proposed here is a further evolution in detecting misreporting, and can be viewed as ultimately facilitating fairness behaviors in a world of financial reporting uncertainty.

and $AccR_U$ involves two values (one that is the benchmark determined by the auditor and the other that is the auditee's proposed point estimate), so that there is a different risk associated with each value. The reason we need two values is to allow us to distinguish between the intentional material misstatement risk and the acceptable unintentional material misstatement risk due to accounting uncertainties (i.e., the $AccR_U$ associated with the benchmark). In this framework $AccR_I$ is the risk of material intentional misstatements in accounting estimates from forecast errors. $AccR_I$ should therefore be part of fraudulent financial reporting, as per *SAS No. 99* (AICPA, 2005: section AU 316.63) and equivalent international standards.

The two values, benchmark and auditee's reported value, are the basis for calculating $AccR_I$ and $AccR_U$ from the single distribution reflecting the auditor's best judgement about forecast uncertainties after obtaining all the evidence on the facts (e.g., AICPA, 2005: section AU 328.24).[13]

Although the above is somewhat tedious even for simple discrete distributions like the Johnson (1994: 37–9) lottery example, this rule comes in handy for all future event distributions when we have to decide what the $AccR_I$ and $AccR_U$ are. Such distributions are increasingly common under fair value accounting (e.g., see Benston, 2006).

I now summarize the above discussion as a series of general steps listed in Exhibit 1.

If during the engagement the auditor assesses the risk of intentional material misstatements as too high (e.g., greater than "remote" as suggested by PCAOB, 2004: 12), then the auditor may decide to withdraw from the engagement (per AICPA, 2005: section AU 316.78) rather than expand the scope of the audit.

Whose distribution is this, one may ask? According to audit standards and theory, it should be the distribution identified by the auditor after gathering all the evidence on the facts, including all the auditee's information and explanations supporting its estimate (e.g., ISA 540.495; AICPA, 2005: AU section 328.40; IFAC, 2008: A87; Mautz and Sharaf, 1961: 110). The auditor may also wish to consult with experts to help identify appropriate benchmarks and their associated $AccR_U$s, and the $AccR_I$s associated with an auditee's recorded estimates. For example, see *SAS No. 99* (AICPA, 2005: section AU 316.54). One input to developing benchmarks might be the new business risk approaches to auditing (e.g., see Peecher, Schwartz, and Solomon, 2007: 478). Such approaches can be used, for example, to help determine the forecast-error distribution that combined with EBAT reasoning to identify the appropriate reasonable range for accounting estimates. Such reasonable ranges would serve as the benchmarks discussed here (e.g., see Ericksen, Mayhew, and Felix, 2000: 168; Peecher et al., 2007: 478, but they do not use the framework developed here).

13. In full generality, there could be different probability distributions associated with $AccR_U$ and $AccR_I$. For example, in finance there is the concept of model risk used in portfolio risk management (Hull, 2007: ch. 15). Conceivably the same set of facts may be inputs to more than one valuation model. I leave such refinements to future research. Here I assume only one distribution of accounting misstatements for *AccR* of each account. It is for the auditor to establish the modeling of forecast error after obtaining appropriate evidence regarding the facts of the situation (including, of course, all the auditee justifications for their estimate).

Exhibit 1 Steps in Identifying Fraudulent Financial Reporting and *PMM*, Incorporating All the Risks of Figure 2

1. Identify the forecast-error distribution of possible future values (e.g., future benefits, future cash flows, or future realizations) — this involves reasoning similar to that identified in Glover et al. (2005).

2. Identify the benchmark that results in fair presentation (it does not have to be included in the distribution above — the benchmark can be any appropriate value in the circumstances). Under EBAT criteria, the benchmark has the property that it results in the lowest *AccR* for the forecast-error distribution. This does not guarantee, however, that the *AccR* associated with the benchmark value is acceptable. Optimally, accounting standard-setters should decide what is the acceptable level of *AccR* for specific accounts as a matter of principle. Failing that, the onus is put on the auditor as part of deciding whether the reported amounts and disclosures "present fairly".

3. Identify the maximum $AccR_U$ for the benchmark (*B*) using the distribution in step 1. If this maximum $AccR_U$ is not acceptable, then neither is *AccR* by (5). Look for a different *B* with lower $AccR_U$. If none can be found, then there is no appropriate *B* for recording an asset under EBAT. No appropriate benchmark means by EBAT reasoning that any nonzero asset recorded by the auditee should be adjusted to zero.

4. Calculate the $AccR_I$ for the value proposed or reported by the auditee using the distribution in step 1.

5. Use (5) to calculate overall *AccR* based on $AccR_U$ and $AccR_I$ calculated above to decide whether the estimate is acceptable.

6. Use (2) to calculate PMM_I for purposes of *SAS No. 99* (AICPA, 2005: section AU 316.78) and PCAOB AS #2.25–6 requirements to assess risk of fraud. That is, the risk of fraud is PMM_I. Compare this to the acceptable level of risk — for example, "remote" as suggested by PCAOB — and if PMM_I is acceptable, then the auditor can conclude that the risk of fraud does not impair fairness of presentation.

7. Use (1) to calculate *PMM* for the purposes of deciding whether the financial statements are fairly stated using, for example, the SEC concept of fair presentation, which means not misleading (at low enough probability). That is, the auditor now makes an overall assessment, incorporating all the four categories of uncertainty, to decide whether the financial statements present fairly. The auditor may also wish to set separate acceptable levels for each of the component risk categories in Figure 2, similar to what auditors currently set as the acceptable (planned) level for the current audit risk concept, $AudR_U$.

Following these steps allows the auditor to meet the requirements of *SAS No. 99* and equivalent standards by outlining how PMM_I can be calculated and related to other audit assessments. This clarifies the overall relationship among the key risks summarized in the quadrants of Figure 2. Benchmarks based on acceptable risk levels appear to be the simplest way of implementing such a reporting framework.

Qualitative issues, as in all risk models, still need to be considered in implementation.[14] However, as the next section shows, many of the qualitative issues of the conceptual framework of financial reporting are significantly clarified with this approach.

DISCUSSION AND SUMMARY

Recently, there has been much emphasis put on a new conceptual framework of financial reporting. Some have proposed closer links among the framework, auditing, and fraud detection. For example, Benston et al. (2007: 234–5) highlight the importance of what they call "trustworthiness" to the relevance of financial reporting and also stress the importance of the relationship between auditing and accounting standards. Schipper (2007: 314–5) reviews the effect of auditing on the reliability of disclosed items. The EBAT framework proposed here can complement such proposals.

Reliability and relevance in financial statement auditing can be summarized via the assertions and an audit risk model that reflects intentional as well as unintentional misstatements of fact (*AudR* per (4)), and these are treated as part of the examination standards of GAAS.

Next, the auditor must decide on the appropriate auditor's report on the basis of the above evidence and his or her knowledge of GAAP and user needs. This decision is covered by the reporting standards of GAAS. But these reporting standards require auditors to consider GAAP and user needs in the particular auditee circumstances. This paper proposes that the simplest way to guide the auditor decisions in this culminating part of the audit process is to include consideration of *AccR* and its components $AccR_U$ and $AccR_I$.

In the case of stewardship, a prime concern regarding uncertainty appears to be with what Benston et al. (2007: 230) refer to as lack of trustworthiness. This paper addresses this concern via the PMM_I concept as summarized above under the heading "The Intentionality Issue".

14. For example, there is the issue whether one-sided or two-sided risk concepts should be used for the *AccR*s. The increasingly influential VaR measure discussed later in this paper is an example of a one-sided risk measure. In addition, the newer business risk approaches to auditing are also largely one-sided risk concepts. Smieliauskas (1999) explored some properties of one-sided risk concepts for financial reporting and found that the most useful feature is that they allow the recording of an asset or liability when two-sided risk concepts would at best provide note disclosure. For example, the FASB's *Interpretation No. 14* regarding estimation of a loss contingency specifies that the minimum loss in the reasonable range be accrued if there is no "better" estimate. Note under this interpretation, the bias is in the opposite direction of what one would expect under conservatism. The merits of one-sided risks are an open issue, however. See Koonce, Lipe, and McAnally (2005) on other aspects of the one-sided versus two-sided risk disclosures debate in the context of financial instruments.

The qualitative factor of verifiability depends on the management assertion, and here we see the interaction of auditing and accounting. For all assertions except valuation, verifiability reduces to *AudR*. Valuation is the exception because it is the assertion that also incorporates forecast error. Other assertions may be affected by valuation, however. For example, a zero-valued item may be said to not exist for financial reporting purposes.

From an accounting theory perspective, *AccR* captures the risk that the recorded number is materially wrong in terms of predicting the amount that will be realized. Thus $(1 - AccR)$ indicates the probability that the forecasted number is "true" or will be realized. We thus want a reliable number for a relevant attribute such as future cash flows, and the trade-offs that can arise between relevance and reliability explain the various measurement attributes that have evolved in financial reporting (e.g., see Scott, 2002: 170–4).

Under the risk-based EBAT principles, the focus is on the probability of realization. The simplest system for determining cutoff probabilities for recognition versus disclosure versus ignoring is to use the logic of statistical hypothesis testing on which EBAT is based and set the upper probability cutoff at (1 − acceptable *AccR*) and the lower bound at acceptable *AccR*, thereby creating three risk categories. This is the simplest possible system given the three basic possibilities in financial reporting of assets and liabilities: record in financial statements, disclose in financial statements, ignore in financial statements. This creates three categories of realizations. Risk category I consists of the recorded items and they have a probability of realization of (1 − acceptable *AccR*) or higher. Risk category II consists of the disclosable items and they have a probability of realization between (1 − acceptable *AccR*) and acceptable *AccR*. Risk category III consists of the items that have a probability of realization below acceptable *AccR*. They can be completely ignored in financial reporting for fairness of presentation purposes.

Who should decide these probability thresholds? I would suggest accounting standards and that this should be a core part of the conceptual framework of financial reporting. Failing that, the onus is on the auditor to decide on the probability thresholds that "present fairly". There is no necessary requirement that the cutoff probabilities be complements of one another, but eliminating such simplifying symmetry should be justified by standard-setters. The importance of the arguments in the previous section is that they indicate that the acceptable cutoff probability is also a function of the benchmark used to determine whether or not intentional misstatements are taking place.

Note that under the EBAT system of reasoning, recording an asset value of zero is equivalent to not recording it in the first place. Otherwise, the auditee could be required to record every zero-valued item possible!

There still remains the question, however, whether the asset with value zero should at least be disclosed in the notes. EBAT reasoning suggests that if the probability of the asset being realized other than zero has a less than acceptable *AccR* level, then there is no requirement to disclose the asset. This way, EBAT clarifies the disclosure objectives of SEC (2003: endnote 101). In the lottery ticket example, the investment has an asset value of 0, with $AccR = 0.01 < 0.05$; thus, not recording and not disclosing this "asset" is acceptable. In other words, we can completely ignore this "asset" in financial reporting. This suggests that from an accounting point of view we have just wasted any cash to obtain this investment

and the debit should therefore go to a loss account. This reasoning is consistent with the accountability objective of financial reporting and could be the basis of a conceptual framework of loss accounting. This would address a weakness in the accounting literature arising from lack of a clearly defined distinction between loss and expense (e.g., see Hendricksen and Van Breda, 1992: 371).

In-between items that are recognized and those that can be ignored are the disclosable items. Because they have too high a probability of being realized but are too low to be recognized, disclosable items should be described in the notes to the financial statements. Any costs incurred to obtain disclosable but unrecorded assets would be best debited to expense.

There are two types of disclosures from the EBAT perspective: note disclosure on recorded items (risk category I: a concern of, e.g., Maines and Wahlen, 2006: 415; Barth, 2006: 282–3) and disclosures of unrecorded items that nevertheless have sufficiently high probability of occurring that users would want to know about them (i.e., risk category II). This threshold is a key feature of completeness of disclosure that helps make operational the completeness concept in the FASB/IASB (2006: xi, 30) evolving conceptual framework.

Figures 7, 8, 9, and 10 illustrate the above reasoning by summarizing examples of various accounting standards that seem to use logic similar to EBAT on some accounting issues. For the auditor, the cutoff probabilities must be based on *PMM*s but for auditees they are based on *AccR*s because of the different states of knowledge these two parties bring to the situation. In particular, from the auditor's perspective the total uncertainty is *PMM* because the external auditor must also be concerned about uncertainties associated with evidence gathering on the facts. Financial reporting from the auditee's perspective, on the other hand, is primarily focused on *AccR* because it can be presumed that management already knows the facts and does not need sufficient appropriate verification by evidence, as an external auditor would.

Figure 7 graphically summarizes the definition of asset recognition rules as covered in the *CICA Handbook* section 1000.44 and international concepts (e.g., see Barth, 2006: 276 especially footnote 11). However, Figure 7 extends the standards reasoning to more comprehensively address when an asset (or liability) can be ignored to present fairly (i.e., risk category III, as discussed above). *AccR* represents the risk if the future benefit is recorded.

Figure 8 illustrates the ignore decision under EBAT for the lottery ticket example in the previous section. If the reader does not agree that this lottery should be totally ignored, it is because he or she disagrees with the cutoff probability category for risk category III. For example, what if the cutoff probability were one in a million? One in a billion? At some point, ignoring the payoff becomes reasonable (e.g., see Maines and Wahlen, 2006: 403, who refer to this as the drop in the relevance of the payoff). If there were no such cutoff, I ask the reader to consider how accounting could make operational disclosing every possible payoff no matter how improbable. The evolving FASB/IASB (2006: xi, 30) conceptual framework suggests the importance of this issue via the changing concept of completeness in financial reporting.

Figure 9 illustrates how similar thinking to EBAT applies to contingency accounting standards. Figure 10 illustrates the logic of a comprehensive framework for dealing with

FIGURE 7 Accounting risk example: Recognition criteria for asset rule — *CICA Handbook* section 1000.44

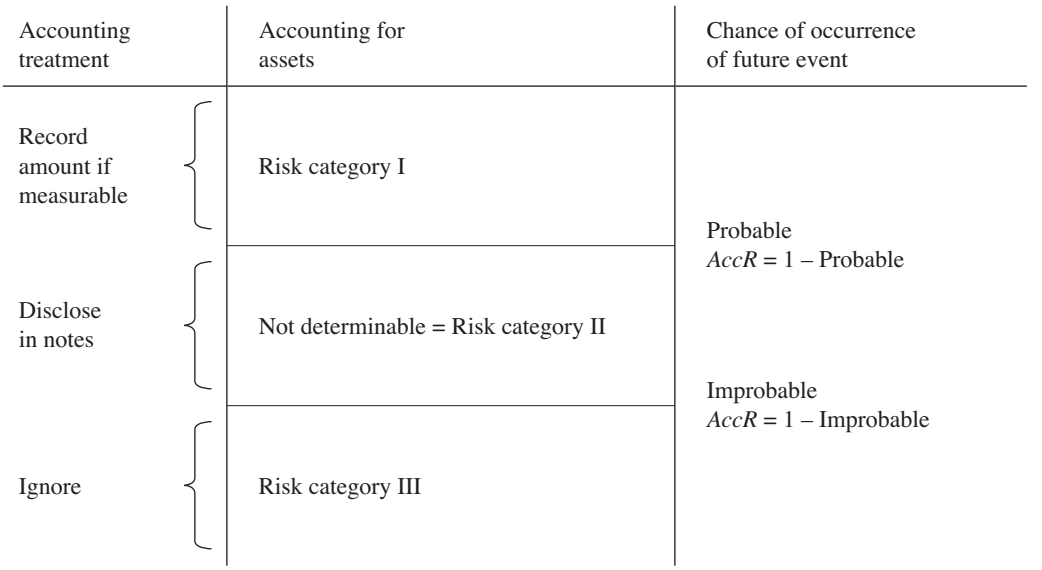
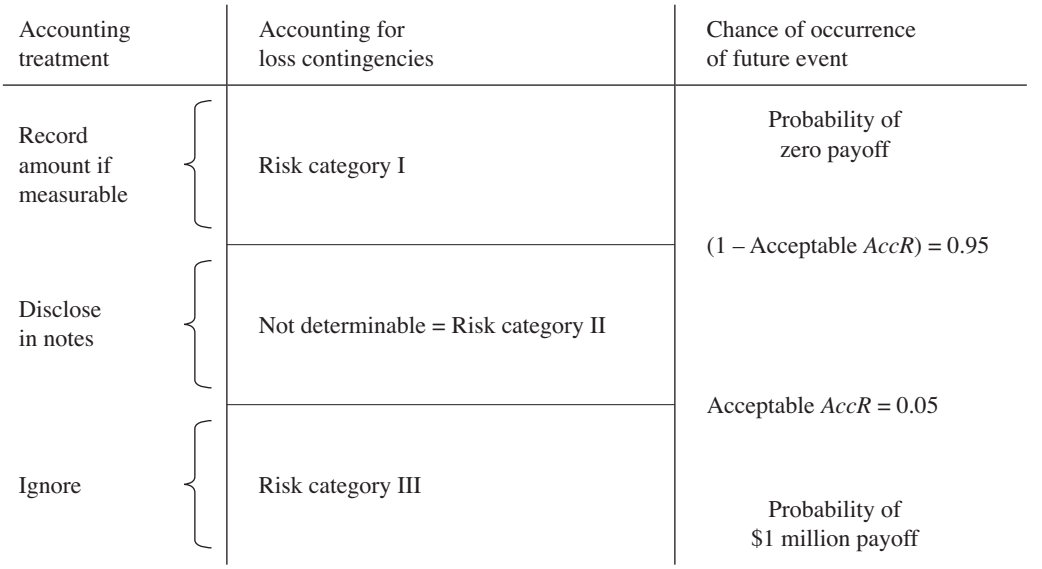
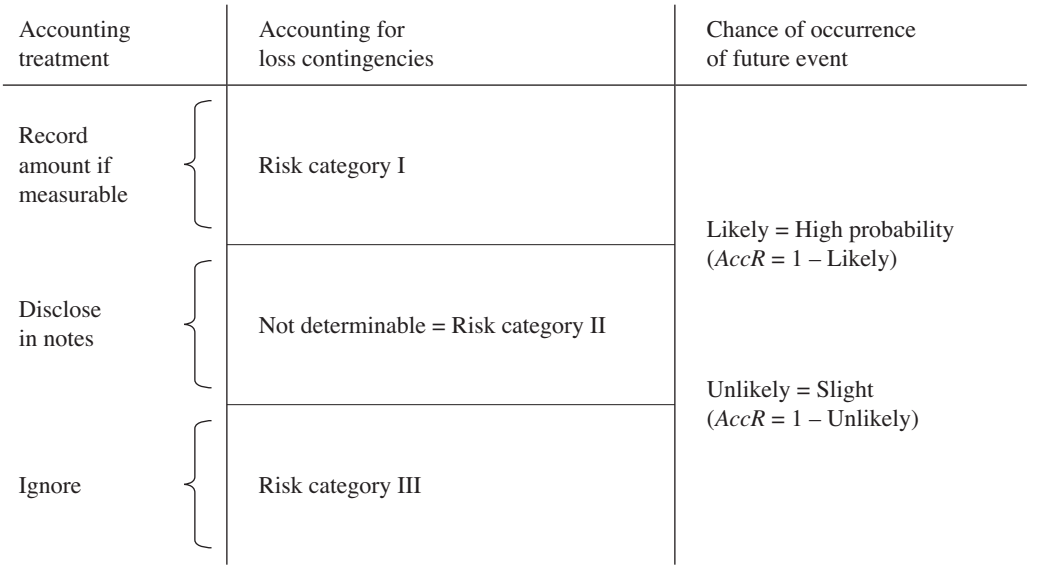


FIGURE 8 Accounting risk example: Lottery ticket example with acceptable risk = 0.05



going-concern reporting as depicted by Boritz (1991). For comparison purposes, Figure 10 also reflects the recent *ISA No. 570* exposure draft regarding going-concern disclosures. (Note that the risk categories in Figure 10 are in ascending sequence rather than descending sequence of risks, as in the other figures. This is because the issue in Figure 10 is one of failing to realize the recorded amounts rather than realizing the recorded amounts. Similar

FIGURE 9 Accounting risk example: Accounting for contingencies rules — *CICA Handbook* sections 3290.06 and .12



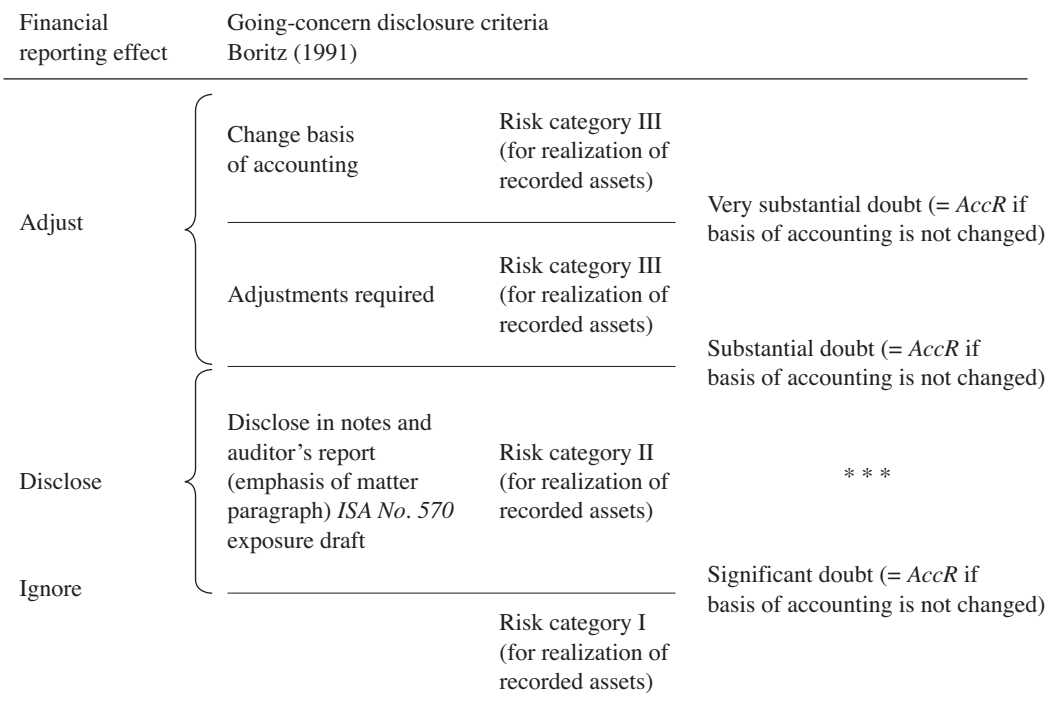
reasoning would apply to impairment of asset accounting.) *AccR* is always measured relative to what is recorded.

The main distinguishing features of these accounting issues are the cutoff probabilities for realization. If the auditee fails to record an asset impairment in the adjust range of the figure, or records an asset impairment when it does not fall in the adjust category, then the auditor must either insist on an appropriate adjustment or issue a (accounting deficiency) report reservation. For example, if the client fails to disclose going-concern problems when the probability of a going-concern problem is as indicated with *** in Figure 10, then the auditor should issue an accounting deficiency report reservation. Note that Figure 10 has four risk categories, which may be justified given the fundamental nature of the going-concern assumption in financial reporting.

Figure 10 illustrates that the previous figures are the most parsimonious system of risk categories possible given the current status of accounting theory. The simplest system requires three categories, as in Figures 7, 8, and 9: record, note disclose, or ignore; or in terms of debits: asset, expense, or loss. Thus, fraud appears as a form of waste or lack of value for resources exchanged in the EBAT framework. Specifically, a loss arises when a risk category I asset is exchanged for a risk category III "asset" (e.g., exchange cash for an asset that should be ignored for reporting purposes, as in the lottery illustration — this makes an asset "disappear" and reduces earnings). Such a loss would be considered intentional under EBAT if the *PMM* exceeded the acceptable level (and the auditee refused to make the necessary adjustment, as discussed earlier).

Finally, Figure 11 illustrates a situation where, superficially, it appears that the criteria based on probability of realization are not used — those of capital lease accounting rules.

FIGURE 10 Accounting risk example: Going-concern disclosures



This appearance arises because the probability of realization is not measured directly. Instead, the probability is measured indirectly using a series of rules or conventions based on conditions. This illustrates that a major purpose of rules-based accounting can be to help assess cutoff probabilities of realization, and thus follow a reasoning system similar to EBAT reasoning based on acceptable risks. The ubiquity of such rules is not surprising because such rules are based on a pervasive form of human thought that uses reasoning by analogy with signs (e.g., smoke is a sign of fire).[15] Each specific rule is a sign or indicator of some condition concerning some other fact. Although such rules are not foolproof, they may provide good enough inferences on which to take action (like pulling a fire alarm). Such rules or signs, as used in lease accounting, may thus be a good indicator that the probability of the realization of the related asset and liability is sufficiently high to record for financial reporting purposes.

15. For example, see Walton (2006: 112–6). Another, less precise way of implementing EBAT reasoning with accounting risks (*AccR*s) is to use an approach similar to the current audit risk model concept (*AudR*s), which is frequently implemented using rough grades such as "high, medium, low" for the component risks when they are not easy to quantify. Such a three-risk category approach is consistent with the three risk categories identified with EBAT reasoning in this paper. Various risk categories are used by credit-rating agencies such as Moody's and S&P, and their success in the marketplace indicates that grades of risk may also be feasible in financial reporting.

FIGURE 11 Accounting risk example: Accounting for leases — *CICA Handbook* section 365.06

Accounting treatment	Accounting for capital leases	Chance of occurrence of future event
Record amount if measurable	Risk category I	Three conditions that meet "probable" criterion: 1. Bargain purchase option 2. Lease term is at least 75% of asset's useful life 3. Payments equal 90% or more of fair value of leased property
Disclose in notes	Not determinable = Risk category II	
Ignore	Risk category III	If none of the above is met, no leased asset exists. An "improbable" asset

Fundamental accounting rules based on signs commonly used in financial reporting include the requirement of a past event, and that certain control criteria by the reporting firm are met. Barth (2006: 276–7) notes that such signs may themselves be subject to verification by facts and explains the need for professional judgement to interpret the facts in the circumstances. Such interpretation is crucial for interpreting the relevance of various measurement attributes (e.g., historical cost or fair value). However, EBAT does address the question raised by Barth (2006: 276) about what is supposed to be measured by the measurement attribute. From the EBAT perspective, it is the probability of realization that should be measured. In this view, argumentation by sign and similar reasoning are primarily ways of implementing assessments of the probability of realization as objectively as possible. Under this interpretation of detailed accounting rules, the fundamental issue is the probability of realization of assets or liabilities, or equivalently, as EBAT views it, the risk that the reported amount will not be realized. Thus, it seems that many aspects of GAAP are consistent with EBAT-type reasoning.

Focusing on reporting uncertainties this way is one way of making operational a more principles-based accounting system. A principles-based accounting system helps justify more detailed accounting rules for specific applications tailored to different legal, regulatory, and economic environments. For example, a specific legal system shapes the likelihood and amount of loss for a contingency based on a specific set of facts. Therefore, accounting principles based on reporting uncertainties can provide more universal guidance that relies on auditor professional judgement to map a particular legal and regulatory system's effect from a given set of facts to auditee business risks and their impact on financial reporting. EBAT may thus provide a better basis for an international conceptual framework to use as a guide to more nationally tailored accounting rules.

Role of EBAT in Reporting on Economic Risks

Perhaps a good current example of the potential relevance of EBAT-type reasoning with benchmarks is the worldwide credit crunch in 2007–2008 tied to subprime mortgages. This credit crisis is threatening a recession and may spread to many more types of lending activities. One way this has affected auditors in Canada is through the liquidity crisis in the nonbank asset-backed commercial paper (ABCP) market. It is estimated that there is $35 billion worth of these securities held by Canadian companies, and a serious problem for 2007 annual audits was how to disclose the impairment risks of ABCPs. There has already been public criticism of the financial statement disclosures of these risks in the Canadian business press (e.g., see Silicoff, 2007: FP1, FP4).

The financial reporting effects of the credit crisis are an example of the accounting risks covered in this paper because if the write-downs and disclosures of subprime mortgage-backed securities are insufficient, auditors should be considering the possibility of intentional misreporting and the use of benchmarks to help identify what would "present fairly". For example, banks' loans in default have been rising much faster than estimates of reserves for bad loans, suggesting that the benchmarks used in making and disclosing the estimates are inappropriate in terms of reflecting estimation uncertainties. "Investors learn that a company has taken a risk only when the risk has gone bad" (Norris, 2008: 1; Hovanesian, 2008: 028). Perhaps the most spectacular example of unexpected credit risks is the investment bank Bear Stearns. Some are attributing the Bear Stearns fiasco to fair value accounting (e.g., see Corcoran, 2008).

In this paper I have addressed in a general (principles-based) way the potential role of benchmarks in financial reporting and auditing. More specific models for creating benchmarks exist to control such risks as market risk, credit risk, operational risk, and nonregulatory business risks that are widely targeted in financial risk management (e.g., see Hull, 2007: ch. 16). In financial engineering, Bachelior's (1900) principle that "uncertainty increases with the square root of time" is increasingly widely accepted as the basis of risk management (e.g., see Bernstein, 2005: 21; Hull, 2007: 112; although for a notable dissenting view see Mandelbrot, 2004). Forecast-error risks in financial reporting also increase with the time interval covered by the forecast. This time-dependency of risk is reflected in the increasingly important value-at-risk (VaR) concept of finance. VaR can be defined as: "We are X percent certain that we will not lose more than V dollars in the next N days" where V is the VaR (Hull, 2007: 196).

There are many ways in which VaR losses can occur, and therefore different VaR models are used for different sources of risk (e.g., market, credit, operational). Increasingly, these VaRs are aggregated at the firm level (e.g., see Hull 2007, ch. 16). They involve aggregations of loss-density functions. A simple example is the lottery ticket payoff distribution. If the auditee paid the expected value of $10,000, then this would be the largest (and most likely in this case) loss. If the time period implied by "in the next N days" is before the payoff date, then the VaR is zero. Otherwise, it is $10,000 at 0.99 probability — in other words, we are 99 percent sure we will lose $10,000. Thus, if we record $10,000 as an asset, the *AccR* equals 0.99 using a one-sided risk concept such as VaR (see footnote 14). In more complex VaR calculations, extreme value theory can be used to estimate the

extremes (tails) of a wide range of loss distributions (e.g., see Hull, 2007: ch. 9). VaR is consistent with the business risk concept of "threats to the auditee's business" that is increasingly used by auditors (e.g., see Knechel, 2007: 393 and Peecher et al., 2007: 465).

We concluded under EBAT that the amount reported for the lottery ticket should be zero. EBAT essentially uses logic consistent with VaR but for the amount reported, which may differ from the amount invested. Thus, an accounting-oriented VaR for an asset can be defined as the risk that the amount recorded overstates the amount to be realized. Thus, if EBAT logic were used in making accounting estimates, the accounting VaR allows statements of the following form: We are (1 − acceptable *AccR*) certain that the estimate does not overstate/understate the amount of the asset/liability that is realized in the next *N* days. The "next *N* days" is determined by the auditor or standardized by standard-setters. Normally, under the annual reporting system, this would include a forecast for up to a year ahead, or until the next audit when any revisions could be considered.

In aggregating most risks of finance into economic capital at risk, a consistent year-ahead time horizon is often used (e.g., see Hull, 2007: 368). Moreover, when there are inconsistent model results in measuring financial risks, the uniform distribution over a reasonable range, similar to the AuG-41 example we have discussed in this paper, is often used in financial risk management (e.g., see Hull, 2007: 352). Thus, risk management principles of many auditee financing activities appear to be consistent in many respects to the EBAT financial reporting principles proposed here. Of course, proper application of these principles would require closer cooperation with specialists from such fields as finance and actuarial science.

With such an EBAT framework, information risk of financial reporting can be defined as risk that economic phenomena as described in financial reports correspond with what they purport to represent. This means that measured and recognized assets meet the acceptable *AccR* levels as discussed above. However, the vaguer the GAAP, the higher the information risks, including the risks from fraud. Disclosed but unrecognized assets or liabilities are valued at zero for recognition purposes and properly disclosed in the notes. See Schipper (2007) for a review of research related to such disclosures.

The risk-based system outlined here appears to address major features of a financial reporting framework for identifying fraudulent financial reporting, including completeness of disclosure. I briefly summarize these features in Table 1. This is a table from the reporting entity's perspective and assumes that all the relevant facts are known by the entity. For an auditor, *PMM* would replace *AccR* in Table 1 because the auditor must contend with the added risks of obtaining sufficient appropriate evidence on the facts. Risks are reflected in two ways as outlined in Table 1. First, asset and liability account categories are grouped by their acceptable risk levels. Second, note disclosures provide additional information on recorded items as well as unrecorded items falling in category II risk levels. Under these conditions, *PMM* may be considered a good proxy for information risk because it reflects misstatement of economic facts (e.g., cash available) as well as the uncertainties with respect to the future economic prospects concerning the auditee. The principles summarized in Table 1 also largely determine the concept of fairness of presentation in the sense of resulting in reporting that is not misleading. Similar to the way that

TABLE 1
Principles of identifying fraudulent financial reporting

1. Simplicity principle	The reporting framework should be the simplest possible given existing accounting and audit objectives and concepts.
2. Risk-based reporting principle	Significant risks and uncertainties as reflected by the concept of *AccR*, as well as the facts; should have primacy of relevance in financial reporting. In particular, *AccR* should be at acceptable levels when recording assets and liabilities in order to allow for fairness of presentation.
3. Consistency principle	All risks and uncertainties covered by the risk-based reporting principle should be treated in a consistent manner such as EBAT (e.g., see FASB/IASB, 2006: 50). This does not mean that acceptable *AccR* is the same for all line items in the financial statements.
4. Objectivity principle	Consistency should be achieved through the use of hypothesis testing and EBAT-type reasoning based on acceptable risk levels.
5. Completeness principle	Consistent with EBAT, all risks and uncertainties with respect to assets and liabilities should be categorized, based on acceptable risk levels, into one of three types: 1. Those that require measurement in the balance sheet. 2. Those that require description in narrative terms (note disclosure). 3. Those that can be ignored for quality financial reporting purposes. The related changes in the balance sheet over time are the basis of income measurement.
6. Fraud (or inefficiency) identification principle	Fraud (or inefficient or wasteful use of resources) should be separately, appropriately disclosed through application of the above principles in conjunction with the rules identified in Exhibit 1. Fraud frequently arises when assets/liabilities from risk category I are exchanged for assets/liabilities of risk category III, without appropriately disclosing the risk consequences.

there can be mispricing of risk in mortgage-backed securities, there can be misreporting of risks in accounting estimates. EBAT helps address this important problem of financial reporting.

Because it is unlikely that *AccR* for many account balances will get as low as *AudR* in the traditional financial statement audit, the major issue in financial reporting is that of addressing the acceptability of *AccR*s in GAAP (e.g., see Smieliauskas, 2007; however, note that for review engagements the acceptable *AudR* is significantly higher than that for audit engagements). For example, debates about the appropriateness of different measurement attributes in different accounts or in different circumstances seem to center on the meaning of "economic events" (e.g., see Barth, 2006: 273–4). Under EBAT, economic events are recognized based on forecast accuracy and the resulting *AccR*s associated with the measured assets and liabilities. This seems to be a key feature of the "truth" of the valuation of assets and liabilities (e.g., see Young, 2008).

The implications of the EBAT framework for identifying fraudulent reporting is that PMM_I may frequently be reduced to acceptable levels chiefly on the basis of appropriate adjusting entries that take into account the riskiness of an estimate as well as its materiality. This is consistent with the IFAC (2008: A48) proposal to identify particularly risky fair value accounting estimates and links the proposal to the broader conceptual frameworks for accounting and auditing.

The EBAT framework clarifies the existing conceptual frameworks of financial reporting and auditing. It does so in a parsimonious manner that is more geared to preventing and detecting fraudulent financial reporting. Of course, much research remains to flesh out the details of such a system but hopefully this commentary has made a convincing case of the potential for such an approach.

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