

Audit Committee Financial Literacy: A Work in Progress

Douglas J. Coates¹
M. Laurentius Marais²
Roman L. Weil³

Abstract We develop a classification to score the potential of corporate audit committees to be financially literate, as defined in this paper, based on listing requirements of the NYSE, promulgated late in 1999. We score audit committees of approximately 300 large companies in 2000 and 2004, and of a subsample in 1996 as well. We find that scores did not change between 1996 and 2000, but have improved significantly since. Still, the audit committees have room for improved financial literacy in the sense that we define. Finally, we find evidence of superior stock market returns to companies who have improved the potential for financial literacy, as we measure it, of their audit committees over the last four years. The improvers in our sample enjoyed annualized abnormal, excess returns of **4.6 percent** per year more than those which did not improve.

In 1999, the New York Stock Exchange added to its listing requirements a rule that each company shall have an audit committee comprising a] independent directors who are b] financially literate, and include c] at least one financial expert.⁴

¹ MBA Student, Graduate School of Business, University of Chicago, whose participation in this work received funding from the School.

² Vice President, William E. Wecker Associates, Inc., 505 San Marin Drive, Novato CA. 94945.

³ V. Duane Rath Professor of Accounting, Graduate School of Business, University of Chicago: Roman.Weil@ChicagoGSB.edu. Katherine Schipper, a member of the Financial Accounting Standards Board and, before that, a professor of accounting, co-authored the Financial Literacy Quiz and has contributed so much to this work that she should be co-author. FASB culture prevents this. It would be a better paper if she had vetted it, which she has not.

⁴ **Boldface added.** Last Modified: 12/20/99.

303.00 Corporate Governance Standards

303.01 Audit Committee

(A) Audit Committee Policy. Each company must have a qualified audit committee.

(B) Requirements for a Qualified Audit Committee.

..... (2) Composition/Expertise Requirement of Audit Committee Members.

(a) Each audit committee shall consist of at least three directors, all of whom have no relationship to the company that may interfere with the exercise of their independence from management and the company ("Independent");

(b) **Each member of the audit committee shall be financially literate, as such qualification is interpreted by the company's Board of Directors in its business judgment**, or must become financially literate within a reasonable period of time after his or her appointment to the audit committee; and

Our work reports on the progress towards Audit Committee Financial Literacy. We organize this presentation into

- review of history from 1999 on financial literacy,
- discussion of the meaning of financial literacy,
- scores of the financial literacy capabilities, as determined by career paths, of the audit committees of 300 large companies, and
- results of a financial literacy quiz taken by over 1,100 board members
- differential stock market returns to portfolios of our companies segregated by the apparent financial literacy of the companies' audit committees..

Brief History of Financial Literacy

In 1999, the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees, convened by the NYSE and the NASD, issued a report recommending that every publicly traded company have an audit committee comprising at least three financially literate members. It did not define *financial literacy* other than to say, “Such ‘literacy’ signifies the ability to read and understand fundamental financial statements, including a company’s balance sheet, income statement, and cash flow statement.”⁵

In December 1999, the NYSE added financial literacy to its listing requirements. It did not say what *financial literacy* means, other than to delegate the decision for any listed company to that company’s board. Aside from the Blue Ribbon recommendation specifically mentioning what we might call *accounting literacy*, listing requirements have not focused on accounting matters.⁶

⁵ Report and Recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees, printed by The New York Stock Exchange and the National Association of Securities Dealers, 1999.

⁶ Some professors of corporate finance have bristled at our suggestions that their performance on the financial literacy quiz described below suggests a lack of such literacy. These professors don’t mind being

Then, in 2002, came the Sarbanes-Oxley Act [SOX], which requires that public companies have an Audit Committee Financial Expert [ACfE], or explain why they do not.⁷ The requirements for the ACfE do not necessarily imply accounting literacy, however, as they allow a CFO to be the ACfE. In the course of our work, we have learned that not all CFOs demonstrate accounting literacy. There are several career paths to CFO, some from within the company:

- Controller,
- Treasurer,
- General counsel, and
- Operating executive.

Other CFO career paths, from outside the company, have been:

- Public accountant (auditor), and
- Investment banker.

Only the controller and public accountant have career paths ensuring accounting literacy. The treasurer understands corporate finance, such as how to raise funds and how to talk to the financial press or analysts, but typically hasn't had a need to understand accounting. The investment banker understands how to raise funds, but aside from some knowledge (now obsolete) of purchase and pooling issues, has typically not had a need to understand accounting.

More important for financial literacy, SOX established the Public Company Accounting Oversight Board [PCAOB, but a misnomer, as considering the role SOX has given the PCAOB, *Accounting* should be *Auditing*]. The PCAOB initially proposed that the auditor should find a company's internal controls deficient if it judged the audit

judged illiterate in accounting, but do in finance. No doubt, audit committee members expert in corporate finance, but not knowledgeable about accounting, will similarly bristle.

⁷ See Section 407 of the Act.

committee to be ineffective. Auditors objected to the PCAOB's proposal because a company can offset any given weakness in an internal control system with some compensating strength elsewhere, and that overall internal control is the issue, not the specific components of the process. The audit committee is just one component of the process. The final rule promulgated by the PCAOB adopted this portfolio approach to internal control:⁸

59. Ineffective oversight by the audit committee of the company's external financial reporting and internal control over financial reporting should be regarded as at least a significant deficiency and is a strong indicator that a material weakness in internal control over financial reporting exists.

The public accounting firms have begun the process of designing their audit guides to instruct their auditors how to deal with the requirement to assess the effectiveness of the audit committee in the context of internal control. PriceWaterhouse-Coopers, for example, says:⁹

Audit Committee Effectiveness

The company's board of directors is responsible for evaluating the performance and effectiveness of the audit committee and demonstrating its assessment to the external auditors. When evaluating the effectiveness of the audit committee, we believe the board should consider the following:

...

- *The audit committee's compliance with exchange listing standards*
- *The level of financial expertise among the audit committee members ...*

⁸ PCAOB Release 2004-001, March 9, 2004. Page A-30—Standard.

⁹ PriceWaterhouseCoopers, *Sarbanes-Oxley Act: Section 404*, July 2004, pp 27-28.

Note the links: Stock exchange listing requirements for financial literacy, PCAOB rules for auditors, auditors' guidelines to meet listing requirements.¹⁰ Audit committees need financial literacy. Whether this means accounting literacy remains open. The rest of this report assumes it does.

Financial (Accounting) Literacy

We have developed criteria for financial literacy in presentations to board members. We base the criteria on the mandatory disclosure of Critical Accounting Policies and Estimates section of the Management's Discussion and Analysis section of the annual report. All the numbers in the financial statements (except the date) are estimates. Management must tell us which ones matter. We base our criteria for financial literacy on those judgments:

1. Understand the *transactions* that require the judgments described. [We think all board members should understand how the company earns income—*makes money*, as the layman likes to say, which means that all board members should master this step.]
2. Understand the *accounting and measurement issues* for the policies and estimates.
3. Understand management's *choices* among policies and methods for making estimates and the reasons for them.
4. Understand the implications of management choices for *potential manipulation* of financial reporting.

While these criteria seem straightforward, even minimal, we have anecdotal push-back.

The audit committee chairman of one of the largest and best known U.S. companies said,

“These criteria are wrong. I know I'm good enough to be the audit committee chairman,

¹⁰ Cunningham [2004] explores the inherent contradiction of having the audit committee hire the auditor, as SOX requires, and then having the auditor assess the effectiveness of the audit committee, as the PCAOB, created by SOX, requires. He suggests the states should create certifications for audit committees.

but my company's transactions are too complicated for me to understand them all." This chairman fails even our first test. Note that the criteria don't say, "Understand all the transactions," but do require understanding the ones where accounting choices materially affect the financial statements. Another audit committee member said, "I don't need to know all that; I am a good judge of character and the top executives of my company are the most honest people I have ever met."

Rating Audit Committee Potential for Financial Literacy

Scoring Individuals

We have devised a protocol for scoring the career potential for financial (accounting) literacy of audit committee members, using information provided in the company's proxy statement about each member's career. We use a four-grade score:

4 = Career Path includes accounting, such as public accountant or controller, or provides clear indication of accounting expertise.

3 = Career Path includes Financial Executive, such as Treasurer or Investment Banker, but no explicit accounting functions.

2 = Non-financial business executive, including CEOs without explicit accounting functions.

1 = Career Path as non-business executive, academic without accounting function, not-for-profit executives, politicians, diplomats, former government bureaucrats.

We think readers will be comfortable with this classification, with the possible exception of the distinction between the scores of 4 and 3. Many, likely more than half, of present-day CFOs are 3s. The most common career path to CFO has been through the position of

corporate treasurer, which does not require knowledge of generally accepted accounting principles at the level a controller needs. As a result of conversations with such CFOs and others who work with them, we see a distinct difference in the potential for financial (recall, meaning accounting) literacy between treasurers and controllers.¹¹ Similarly, we think former investment banker CFOs have had less exposure to accounting issues than controllers in their career paths to CFO. As little substantive exposure to accounting issues as the treasurer/CFO has had, the CEO likely has had less. Hence we score CEOs who have not had experience as a financial executive a notch below the financial executive.

Scoring Audit Committees

We grade each audit committee in our sample with a 3-part grade that can range from 111 [worst] to 444 [best]. If a company has more than three members on its audit committee, we use the top three scores.¹² Appendix B provides scoring protocol details designed to allow any reader to replicate our procedures, but there are cases that require judgment.¹³ In all, we have scored audit committees for about 300 companies, having at least three persons each. Thus, we have scored more than 900 individuals.

Companies Rated

We rated the 200 largest and 100 smallest companies in the *Fortune* 1000 list, as published in April 2004, provided those companies provided data in proxy statements on audit committees for the year 1999 or 2000. Appendix B gives the details of inclusions

¹¹ More than one CFO treats as a badge of honor the fact that he (these are always men) doesn't know GAAP, but relies on a trusted controller.

¹² We view financial literacy as lexicographic in the sense that one person of score 4 is better than five people with score 2. This view does not affect our work, only the order of the rows and columns presented in the transition matrices, Exhibits 1-3.

¹³ During the process of scoring the individuals, we isolated some difficult-to-classify cases and scored them independently. As a result, we devised more rules, detailed in Appendix B, to deal with the ambiguities we encountered.

and exclusions. We required information for 2000 and 2003 so that we could track how the audit committee score has changed.

We rated the largest 50 companies' audit committees also for 1996, to get some indication of whether the change we observe between 2000 and 2004 merely continues a trend or represents, in fact, a change coinciding with the corporate scandals and new listing requirements.

Results

Exhibit 1 shows our primary results: a cross-classification of audit committee scores in 2000 and in 2004 for the 200 largest companies. A company's score for 2000 determines its row and the score for 2004 its column. For example, the cell at the intersection of row 322 with column 421 contains the number 1, with the name Lehman (Bros.), indicating that only one company had its audit committee score 322 in 2000 and 421 in 2004. Row 211, column 222 contains the the designation 0+1 for Berkshire Hathaway, indicating that in 2000 the audit committee had only one member. The 1+1 entry for row 421, column 422, indicates that one company, Sanmina, had a 2000 audit committee with only two members, while another company, Tenet Healthcare had at least 3 members in both years.

Exhibit 1 is color-coded (shaded) into four classes: the audit committee score remained the same between 2000 and 2004 (on the diagonal, in white), or the score improved (below, to the right of, the diagonal, in blue or dark gray), or the score got worse (above, to the left of, the diagonal, in yellow or light gray), or the score changed but the quality of the change is ambiguous (medium gray or cell shows 0+1 or 1+1). The score change is ambiguous, as in the case of Lehman Bros (322 to 421), when at least one

component of the score gets better (for Lehman, the top score increased from 3 to 4), while at least one got worse (for Lehman, the third score declined from 2 to 1); or, when the audit committee improved by virtue of simply adding a member, such as when the 2000 audit committee had fewer than 3 members and the 2004 committee has 3 or more members.

Hall of Fame

No company has an audit committee with a score of 444, which likely means that board nominating committees think not every audit committee member needs to understand GAAP in his or her own head. Four companies—Dow, Aetna, ConocoPhillips, and Qwest—score 443, with Dow scoring 443 in 2000, as well. Two of these companies, Aetna and Qwest have had some accounting difficulties in recent years and their high audit committees' high scores likely reflect a concern with beefing up the financial literacy in the wake of accounting troubles.¹⁴

Dow Chemical stands alone at the top of this list.¹⁵ MBNA appears to have made the greatest change for the better, from 111 to 431.

At the Bottom

One company from the top 200, CVS, has an audit committees currently scoring only 221. Thirty-six from the largest 200 companies score 222, including Berkshire-Hathaway, ChevronTexaco, and Citigroup. The score of 2 indicates a CEO whose proxy bio reports no experience as a financial executive. Berkshire-Hathaway might assert, "We

¹⁴ Farber [2004] found, in a sample of firms cited for violation of SEC Rule 10b-5, a positive association between fraud detection and subsequent improvements in the quality of the board of directors and audit committee activity.

¹⁵ One of its members receiving a score of 4 might be a 3. The member has never been an auditor nor a controller, but has been on the board of the AICPA and a trustee of the Financial Accounting Foundation.

don't need them; our audit members collectively have equivalent, even better, experience, judgment, and wisdom than does a former audit partner." Perhaps, but do these 2s genuinely understand how management can manipulate income with year-end purchases or by classifying hedges as effective, or not?

Thirty-seven of the largest companies companies have audit committees ranking 222 or lower. At even money, we'd bet that at least one of them produces an accounting scandal within the next five years.¹⁶

Progress

Do the data in Exhibit 1 suggest progress towards greater audit committee financial literacy? Yes. We performed the following simple test. First, focus on the companies in which audit committee scores changed clearly for the better (93) or for the worse (23), excluding the 72 whose scores did not change and the 12 whose scores changed in an indeterminate direction. There are 116 (= 93 + 23) audit committees changing clearly for the better or for the worse. We specify a null hypothesis that conditional on observing a classifiable change, changes for the better and for the worse are equally likely. We then calculate, based on these data, the two-sided p-value of equal probabilities. (What are the chances that with 116 coin flips, each having equal chances of heads or tails, there will be a preponderance of heads or tails as great as 93 of 116?) The p-value is less than .0001, indicating a statistically significant elevation above 50% of the probability of a change for the better.

¹⁶ See the data at <http://securities.stanford.edu/> which suggests that any one company has about a 2 percent chance of being involved in accounting-related scandals in any one year. This suggests that any one company has at best a 98 percent chance of avoiding accounting-related scandal, assuming complete serial dependence. The chance that 37 events each with 98 percent of success will all have a successful outcome is $.98^{37}$ which is about 47.5 percent, which means the chances of at least one failure is about 52.5 percent.

Do the changes for the better arise only for the largest companies? No. We examined that question by creating the cross-classification in Exhibit 2, paralleling Exhibit 1, for the 100 smallest companies in the same *Fortune* 1000 list as we used to find the largest 200. The smallest 100 have revenues between \$1.2 billion and \$1.4 billion, while the largest 200 have revenues between \$9 billion (Avnet) and \$259 billion (Wal-Mart). Again, we specify a null hypothesis that conditional on observing a classifiable change, changes for the better and for the worse are equally likely. Fifty-five of the 100 have classifiable changes, 45 for the better and 10 for the worse. Based on these data, the two-sided p-value of equal probabilities is also less than .0001. Here also the probability of a change for the better appears statistically significantly elevated.

Timing of Changes in Regulations Appear to Matter

Have things changed since the new listing requirements have taken effect? Yes. We examine that question by creating the cross-classification in Exhibit 3, paralleling Exhibits 1 and 2, for the 50 largest companies in our list between 1996 and 2000.

Again, we specify a null hypothesis that conditional on observing a classifiable change, changes for the better and for the worse are equally likely. Twenty-eight of the 50 have classifiable changes, 15 for the better and 13 for the worse. Based on these data, the two-sided p-value of equal probabilities is 0.47. These changes indicate no departure from equal probabilities of a change up and a change down. In other words, behavior since the new listing requirements looks different.

Market Reaction to Audit Committee Potential for Financial Literacy

The market reacts as though it prefers an audit committee with more potential for financial, that is accounting, literacy. Defond, Hann, and Hu [2004] found significantly positive cumulative abnormal residuals around the appointment of accounting financial

experts to the audit committee, but not around the appointment of non-accounting financial experts or directors without financial expertise. Davidson, et al. [2004] investigated stock returns surrounding 136 appointments of directors to audit committees, and found significantly positive stock price reaction when new members of audit committees have financial expertise. We report our own tests next.

We partitioned those of our 300 companies having sufficient market data for our tests¹⁷ [181 of the 200 hundred largest and 90 of the 100 smallest of the *Fortune 1000*] into two groups for analysis. One group comprises 131 companies whose audit committees improved; a second group of “not improved” companies comprises 130 whose audit committee ratings were unchanged and 29 whose ratings declined¹⁸; and a third, ignored group comprises the 10 companies whose changes were indeterminate (such as a change from score of 322 to 421).¹⁹ For each company we computed a total excess return, relative to an equally weighted market index, for the four-year period from the beginning of 2000 through the end of 2003.²⁰ Then, we computed the average excess return for the 138 improvers separately from that of the 133 non-improvers, both overall

¹⁷ We calculated monthly “abnormal returns” for each company having CRSP returns data for at least 30 months of our initial estimation period (January 1996–December 1999) and for all 48 months of the “target period” for our analysis (January 2000–December 2003).

¹⁸ By “improve” we mean a Pareto improvement in the potential for financial literacy reflected in our scores. To improve, none of the three individual scores for members of the committee gets worse and at least one gets better.

¹⁹ An alternative analysis in which we classified these 10 indeterminate cases as 7 “Improved” and 3 “Not improved” based on lexicographic ordering produced virtually identical results.

²⁰ We calculated as “excess returns,” also known as “abnormal returns,” the prediction errors from a market model in logarithmic returns, using an equally weighted index of NYSE and AMEX firms to represent the market factor for listed firms and an equally weighted index of NASDAQ firms to represent the market factor for NASDAQ firms. We specified our market models in terms of returns defined, for firm i in month t , as $r_{i,t} = \ln((p_{i,t} + d_{i,t})/p_{i,t-1})$, where “ln” denotes the natural logarithm, $p_{i,t}$ the closing price in month t , and $d_{i,t}$ dividends accrued in month t . For each sample firm we recalculated the coefficients of the market model for each successive “target year” in 2000–2003, using as estimation data all available returns from the immediately preceding four-year period. This procedure produced a sample of 271 companies having complete monthly abnormal returns data for 2000–2003. We calculated a “Total Abnormal Return” for each company by summing the monthly abnormal returns across all four years. We calculated the “Average Abnormal Return” for each specified group of companies as the simple average of Total Abnormal Returns for individual companies.

and within subgroups based on the audit committee ratings for 2000. Exhibit 4 reports the results.

Over the 4-year period 2000-2003, the improvers generated a cumulative excess return of 19.73 percent greater than that of the non-improvers, for an annual average of 4.6 percent (compounded annually). We also computed the difference in the excess returns between the improvers and the non-improvers as a function of the starting score. Note for example, that 100 (= 46 + 54) companies started with scores of 311 or 321 or 322. Fifty-four of these improved and forty-six did not. In this group, the improvers out-(excess)-earned the non-improvers by over 31 percent during the four years, or 7 percent per year. These differences are statistically significant in terms of a permutation test on the t statistic for the effect of “Improved” status in a two-way analysis of variance ($p = 0.01$).²¹

The excess returns difference between improvers and non-improvers is not monotonic across sub-groups. We have not tested why this might be so, but we hypothesize that, like us, the market prefers quality over quantity, and views as 411 as preferable to 333. We prefer, but don’t know if the market prefers, one accounting expert, joined by two university presidents, to three corporate treasurers or investment bankers. The improvement from a 222 or worse is less likely to improve to 4xx than is a 333, which, if it improves, must add at least one 4.

Costs and Benefits of a More Literate Audit Committee

²¹ Specifically, this two-way analysis of variance included main effects for initial-score-group and improvement-status. Because we expect that the standard assumptions for the validity of parametric ANOVA test statistics do not apply to our data, we applied a nonparametric method to the ANOVA t statistic for the effect of “Improved.” We used a Monte Carlo method to approximate the permutation distribution of the t statistic under permutation of the “Improved” and “Not improved” labeling of companies within each subgroup based on initial committee structure. In a random sample of 1,000 permutations, the recalculated t statistic was greater than or equal to our sample value in 10 cases, yielding an estimated p-value of 0.010, with a 99 percent upper confidence bound of 0.020.

What does it cost to improve the potential literacy of the audit committee? The out-of-pocket costs is likely zero, but surely less than \$100,000 per year for replacing a 3 or 2 or 1 with a member who scores 4. Consider that we know, anecdotally, dozens of potential 4s [think former partners at Arthur Andersen or retirees from the Big 4 accounting firms who must leave the firm at age 60 or 61] who can do the work. These 4s don't bring glamour, but they are abundant. On average for companies with market capitalization of \$10 billion, companies which improved their audit committees' potential literacy had increases in wealth of about \$580 million per year greater than the companies whose audit committees didn't improve. You can hire a lot of ex-Andersen partners for \$600 million per year.

Results of Financial Literacy Quiz

We have offered a multiple-choice quiz covering a variety of accounting and audit committee topics to attendees at the Chicago GSB, Stanford Law School, and Wharton multiple-day executive education sessions for board members. Over the past four years, more than 1,400 attendees, almost all board members or CEOs or CFOs or general counsel, have taken this quiz. The 25-item quiz contains 13 questions whose answers are in the textbook we have used to teach first-quarter, first-year MBA students, 2 items of basic audit committee issues, and 7 items required clear understanding of some topics currently pertinent for many companies, but advanced. See Exhibit 5 for a compilation of question topics, our taxonomy of difficulty level, and the results.

The median score on this quiz is about 8 correct out of 25, and this score has remained constant over several years' of testing. The results point to financial illiteracy. The individual quiz takers, self-selected from larger audiences, are likely people more

confident of their financial literacy than those who did not take the quiz.²² Note that fewer than 30 percent of the respondents gave the correct answer for six items which one could answer from the first-term MBA textbook. One of these, item 20 on retained earnings, as defined in Chapter 2 of the textbook, has only 40 percent correct answers. The people who took this quiz, likely the better half of our board member attendees, are not yet financially literate.

Survey of Efforts to Track or Improve Financial Literacy

Three years ago, we sent a short questionnaire to audit committee chairs. The survey's meat asked:

- *Does the company or its Board assess the financial literacy of the members of audit committee? If so, how?*
- *Has the company or the board taken steps since 1999 to increase the financial literacy of the members of the audit committee? If so, what?*

Summary of the Results

We received 27 responses, 25 from audit committee chairs and 2 from CFOs. None of the respondents reported any formal process to assess the financial literacy of the audit committee members. The majority of the respondents report that the someone—general counsel, other board members, management, search firms—screen candidates before nominating them. Two-thirds assessed the financial literacy of the potential audit

²² One of us can report that in over 35 years of teaching, many students have said the equivalent of, “I don’t have time to take the [optional] exam in class you’re about to give, but, don’t worry, I know the material. I’m just too busy.” *Not once* has such a student excelled on the final examination in the same course. We think unlikely that those who have attended these sessions and chosen not to take the quiz would have done better than those who did.

committee members by looking at the background of the candidates and evaluating their academic and professional experience. Two responded that they do not assess the financial literacy. Another two responded that they perform the assessment informally and gave no details of the assessment process. The remaining responded that the board reviews the members but they did not mention the process by which they review their financial literacy.

Not one of the respondents indicated that their board had any formal process to increase financial literacy of the audit committee members. Several report that board members attended seminars, read publications, and hired consultants to meet with them and management to review financial issues. We found neither evidence of formal training nor systematic steps taken by the firm to increase the literacy of the audit committee members. None of the respondents indicated that they had any way of evaluating the impact of practices that they do follow to increase financial literacy.

Other Research Bearing on These Subjects

We have mentioned the results of several studies by others at appropriate places above. Our review of the literature found some other studies bearing, at least tangentially, on this work.

- Xie, et al. [2001] found that board and audit committee members with corporate or financial backgrounds are associated with firms that have smaller discretionary current accruals.
- Felo et al. [2003] found that the composition (expertise and independence) and size of the audit committee positively relates to the quality of financial reporting, as measured by an independent rating service.

- Dezoort and Salterio [2004] found, in an experimental study with about 70 subjects who were board members, that greater independent director experience and greater audit knowledge was associated with higher audit committee member support for an auditor who advocated a "substance over form" approach in the dispute with client management.
- Song and Windram [2000] found in their study of UK companies over the decade of the 1990s that financial literacy and audit committee meeting frequency all reduce the probability of standard violations in financial reporting.

Conclusions

Our title tells all but the details. Audit committee members appear not yet literate if by *financial literate* we mean understanding accounting at the level of an introductory MBA accounting course. Boards appear to have begun the process of improving financial literacy. Shareholders appear to benefit from the company's having a more literate audit committee and the magnitude of the return dwarfs the costs of increasing that literacy.

Appendix A. Illustration of Financial Literacy Criteria, Based on Kodak's Disclosure

We illustrate the 4-point criteria for financial literacy using Kodak management's disclosure of its critical accounting policies and estimates. Kodak mentions inventory issues in its note: "Kodak reduces the carrying value of its inventory based on estimates of what is excess, slow-moving and obsolete, as well as inventory whose carrying value is in excess of net realizable value...."²³

1. Understand the transactions that cause management to have to make a judgment about inventory carrying value.

Kodak purchases more raw materials or manufactures other items for inventory than it sells during a period. It has ending inventories on its balance sheet. The accounting equation requires a valuation [Kodak calls it *carrying value*] of those inventories in order to measure cost of good sold. Kodak tells us this importantly affects its reported numbers.

2. What choices among accounting methods and estimates must management make in reporting on those transactions?

In Kodak's case, management must make four sorts of choices to measure inventory carrying value: cost basis (for example, historical cost, replacement cost, lower of cost or market), frequency of inventory calculations (periodic or perpetual), cost inclusion rules for manufactured inventory (where on the spectrum of direct versus absorption costing to put itself), and whether to use a cost flow assumption and if so, which one (specific identification or a choice between LIFO, FIFO, weighted average). This illustration focuses only the last of these, the cost flow assumption.

Which unit's costs flow into cost of goods sold during the period—the cost of the first units produced (FIFO), or the cost of the last units produced (LIFO), or the cost of the next unit produced (NIFO), or an averaging approach, or even specific identification. US GAAP allow all of these except NIFO; other countries forbid LIFO as well.

3. What did management choose and why? Kodak chose LIFO. From the outside, we can guess that Kodak chose LIFO because of its effects on deferrals of tax payments. An audit committee member needn't guess.
4. Most important. A financially literate board member needs to understand the implications for financial reporting of management's choice, including the potential this choice gives management to manipulate income.

²³ This sentence appears in Kodak's annual reports for both the years 2002 and 2003 in the MD&A section.

For example, choosing LIFO instead of FIFO means reporting lower income in times of rising prices, but deferring income tax payments until the company dips into old LIFO layers.

And: management can manipulate end-of-period purchases to manipulate income under LIFO.

And: the audit committee should be ready to understand why entering a new line of business will enable avoiding decrements to LIFO layers and avoiding higher tax payments than would occur without the new line.

Appendix B. Data Collection and Scoring Procedures for Audit Committee Scoring

1. Company selection: Start with the *Fortune 1000*²⁴ list to select companies for the data set. Companies were eligible if the company web site provided proxy statements for either 2004 or 2003 and for either 2000 or 2001. Exclude companies that were not public throughout the period 2000/2001 through 2003/2004 or for which proxy statements were not available. The top 200 and bottom 100 surviving companies constitute the populations. The 200th company is 223 on the list. The largest of the smaller 100 is 882 on the list. For 1996, the population is the top 50 companies from the 2004 *Fortune 1000* list²⁵ for which proxy statements existed for both 2000/2001 and for 1996.
2. As an alternative, download the proxy statements from the SEC website / EDGAR, form def 14a. Use the most recent, as of June 2004, proxy filing and the proxy filed in 2000 or, if not available, the 2001 proxy.
3. From the proxy statements, identify the audit committee members, either from the audit committee report or a listing of the members/chairs/Audit Committee Financial Experts [ACfEs]. In some cases, audit committee lists included both current members as well as new directors designated for appointment to the audit committee. The data set includes all such listed members.
4. Copy into the data set the proxy statement descriptions for each individual and separately track any individual designated as chairman or designated as an ACfE.
5. Scoring: First, score each individual proxy statement description; call this Score A, recorded in the Note A column. . This scoring uses the following taxonomy:
 - 4: Individual is a CPA, or has had controller experience, or worked as a partner in a Big 5 firm (D&T, E&Y, PwC, AA, KPMG, or one of their predecessor firms) , or is a professor of accounting, or has obvious accounting experience—such as serving on the FASB or similar.
 - 3: Individual does not qualify for 4 and has CFO experience, or is a professor of finance, or is an executive in a financial services business or investment banking or investment management or venture capital.
 - 2: Individual does not qualify for a 3 and has general management experience in a public company, is a professor in a business school or in an economics discipline, or is a private investor.
 - 1: Individual comes from a non-business background such as law, medicine, engineering, and non-profits, or is professor of a non-business discipline.

²⁴See www.fortune.com for the Fortune 1000 list as of 2004, which requires a subscription. Or, see, *Fortune* for April 5, 2004, Vol. 149, No. 7.

²⁵ Same data source as in preceding note.

Individuals receive the highest score that they qualify for. Note that other directorships do not influence scoring,. So, for example, board members of a financial services company do not qualify for a 3 unless the work experience outside of the directorship qualifies them as such.

Scoring is independent of a person's status as chairperson or ACfE.

6. Following this, Score B, records a single score per individual using all available information for that person. For example, if an individual is on the boards of two companies and one proxy lists him as a former CFO while the other lists him as a former controller, then Score A grades the two as a 3 and a 4, respectively, but Score B uses 4 for both companies. As such, individuals get the same score in the same year for all companies in which they are a director.

Sometimes, the 2004 statement provides information not contained in earlier proxy descriptions, particularly that an individual has a CPA. If the 2004, but not the 2000, mentions fact of director's being a CPA, Score B for 2000 reflects the assumption of a CPA in 2000, a Score B of 4. In the cases where the Score A differs across the two years, then we use judgment to decide whether to increase the 2000 Score B to match the 2004 Score B. The individual gets the same score for 2000 and 2004 unless the 2004 disclosure indicates a credential received or job undertaken since 2000.

7. Use Score B from this point forward. Aggregate for a single company the Score B data into a single list of 4s, 3s, etc. for each year. Use only the top three scores for the company, so, for example, a company with 6 audit committee members with grades of 4,3,2,2,2,1 would receive a grade of 432. If a company's audit committee had fewer than three members, then assign a score of 1 to the vacant spot or spots. Ranking, from best to worst, is 444, 443, 442, 441, 433, 432, 431, 422, 421, 411, 333, 332, 331, 322, 321, 311, 222, 221, 211, 111.

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Exhibit 1

Transition Table: 200 Largest Companies, 2000-2004

Row Shows Audit Committee Score for 2000; Column Shows Score for 2004

How Many?	2004 Score																	2000 Score				
	111	211	221	222	311	321	322	331	332	333	411	421	422	431	432	433	441		442	443	444	
444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	444
1	443	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 Dow	-	443
-	442	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	442
-	441	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441
6	433	-	-	-	-	-	-	-	-	1 Trav	-	-	-	-	3	1	-	-	-	1 Aetna	-	433
5	432	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	1 Conoco	-	432	
-	431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	431
8	422	-	-	1 Citi	-	-	-	-	1 IBM	-	-	-	5	-	1	-	-	-	-	-	-	422
3	421	-	-	-	-	-	-	-	-	-	-	2(1)	1	-	-	-	-	-	-	-	-	421
-	411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	411
12	333	-	-	-	-	-	1	-	3	5	-	-	-	-	1	2	-	-	-	-	-	333
29	332	-	-	-	-	3	2	-	13	2	-	-	4	-	3	2	-	-	-	-	-	332
3	331	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	331
61	322	-	-	-	7	-	-	20	-	13	4	1 Lehman	7	-	4	4	-	-	-	1 Qwest	-	322
10	321	-	-	-	2	-	1	5	-	1	-	-	-	1	-	-	-	-	-	-	-	321
-	311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	311
48	222	-	-	1 CVS	21	-	-	14	-	3	2	-	-	3	-	-	3	-	-	1 Abbott	-	222
9	221	-	-	-	3	-	-	3	-	-	-	-	1(1)	-	2	-	-	-	-	-	-	221
3	211	-	-	-	1(0,1) BRKS	-	-	-	-	1 Health et	1 Wyeth	-	-	-	-	-	-	-	-	-	-	211
1	111	-	-	-	-	-	-	-	-	-	-	-	-	1 MBNA	-	-	-	-	-	-	-	111
199	-	-	2	35	-	4	45	1	35	17	-	1	22	3	18	12	-	1	4	-	200	

4 = Career Path includes accounting, such as public accountant or controller.
 3 = Career Path includes Financial Executive, such as Treasurer or Investment Banker, but no explicit accounting functions.
 2 = Non-financial business executive, including CEO's without explicit accounting functions.
 1 = Career Path as non-business executive, academic without accounting function, not-for-profit executives, politicians, diplomats, government bureaucrats.

For example, refer to row 222 and column 322, where the number 14 appears. 14 audit committees scored 222 in 2000 and 322 in 2004.

Refer to row 421 and column 422; the 2(1) indicates two companies, one of which had only two audit committee members in 2000, although 3 in 2004

Refer to row 211 and column 222; the 1(0,1) indicates one company, which had only one audit committee member in 2000, although it had three by 2004

We specify as our null hypothesis that, conditional on observing a classifiable change, changes for the better and for the worse are equally probable, both having probability 0.5. The observed proportion of "more qualified" outcomes among the 116 classifiable changes was 80.2%. Based on these data, the two-sided p-value of a test of equal probabilities is less than 0.0001.

Probability is = 3.60E-11

Douglas J. Coates and Roman L. Weil

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Color Coding

No Change = 72	White
Indeterminate Change = 12	Gray; in monochrome version, this is medium gray
Change for Better = 93	Blue; in monochrome, this is dark gray
Change for Worse = 23	Yellow; in monochrome this appears as light gray
<u>200</u>	

The count includes, also, companies with fewer than three audit committee members in 2000.

Exhibit 2

Transition Table: 100 Smaller Companies, 2000-2004

Row Shows Audit Committee Score for 2000; Column Shows Score for 2004

		2004 Score										2004 Score											
		111	211	221	222	311	321	322	331	332	333	411	421	422	431	432	433	441	442	443	444		
2000 Score	444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	444	2000 Score
	443	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	443	
	442	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	442	
	441	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441	
	433	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	433	
	432	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	432	
	431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	431	
	422	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	422	
	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421	
	411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	411	
	333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	333	
	332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	332	
	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	331	
	322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	322	
	321	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	321	
	311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	311	
	222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	
	221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	
	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	211	
2000 Score	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	2000 Score
		111	211	221	222	311	321	322	331	332	333	411	421	422	431	432	433	441	442	443	444		
		-	1	1	13	1	8	19	3	18	5	-	3	5	-	10	9	-	2	2	-	100	

4 = Career Path includes accounting, such as public accountant or controller.
 3 = Career Path includes Financial Executive, such as Treasurer or Investment Banker, but no explicit accounting functions.
 2 = Non-financial business executive, including CEO's without explicit accounting functions.
 1 = Career Path as non-business executive, academic without accounting function, not-for-profit executives, politicians, diplomats, government bureaucrats.

Color Coding

No Change = 31 White
 Indeterminate Change = 14 Gray; in monochrome version, this is medium gray
 Change for Better = 45 Green; in monochrome, this is dark gray
 Change for Worse = 10 Yellow; in monochrome this appears as light gray
 = 100

We specify as our null hypothesis that, conditional on observing a classifiable change, changes for the better and for the worse are equally probable, both having probability 0.5. The observed proportion of "more qualified" outcomes among the 66 classifiable changes was 84.8%. Based on these data, the two-sided p-value of a test of equal probabilities is less than 0.0001.

Probability is = 6.90E-09

Exhibit 3 **Transition Table: 50 Largest Smaller Companies, 1996-2000**
 Row Shows Audit Committee Score for 1996; Column Shows Score for 2000

		2000 Score																					
		111	211	221	222	311	321	322	331	332	333	411	421	422	431	432	433	441	442	443	444		
1996 Score	444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	444	1996 Score
	443	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 Dow	443	
	442	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	442	
	441	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441	
	433	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	433	
	432	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	432	
	431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	431	
	422	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	422	
	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421	
	411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	411	
	333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	333	
	332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	332	
	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	331	
	322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	322	
	321	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	321	
	311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	311	
	222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	
	221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	
	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	211	
1996 Score	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	1996 Score

4 = Career Path includes accounting, such as public accountant or controller.
 3 = Career Path includes Financial Executive, such as Treasurer or Investment Banker, but no explicit accounting functions.
 2 = Non-financial business executive, including CEO's without explicit accounting functions.
 1 = Career Path as non-business executive, academic without accounting function, not-for-profit executives, politicians, diplomats, government bureaucrats.

Color Coding

No Change = 17 White
 Indeterminate Change = 5 Gray; in monochrome version, this is medium gray
 Change for Better = 15 Green; in monochrome, this is dark gray
 Change for Worse = 13 Yellow; in monochrome this appears as light gray
 = 50

We specify as our null hypothesis that, conditional on observing a classifiable change, changes for the better and for the worse are equally probable, both having probability 0.5. The observed proportion of "more qualified" outcomes among the 31 classifiable changes was 58.1%. Based on these data, the two-sided p-value of a test of equal probabilities is approximately 0.47.

Probability is = 47.3%

Exhibit 4

Association of Cumulative Abnormal Returns with Audit Committee Composition

Composition of Audit Committee in 2000	Cumulative Abnormal Returns 2000-2003 by Change in Composition of Audit Committee			Annualized Abnormal Returns
	Not Improved	Improved	Difference	$(1 + [3])^{.25} - 1$
	[1]	[2]	[3] = [2] - [1]	[4]
222 or worse	-33.27% <i>(n=30)</i>	-27.74% <i>(n=53)</i>	5.53%	1.35%
311-322	-33.43% <i>(n=46)</i>	-2.34% <i>(n=54)</i>	31.09%	7.00%
331-333	-26.85% <i>(n=32)</i>	37.15% <i>(n=15)</i>	64.00%	13.17%
411 or better	-22.24% <i>(n=22)</i>	-4.92% <i>(n=9)</i>	17.32%	4.07%
All	-30.02% <i>(n=130)</i>	-10.28% <i>(n=131)</i>	19.73%	4.61%

Note: We calculate the "Cumulative Abnormal Returns" reported in columns [1] and [2] as the exponential function of cumulative abnormal returns in logarithmic form, minus 1.

Exhibit 5 Results of Financial Literacy Quiz, 2002-2004

Quiz by Katherine Schipper and Roman L. Weil
 See: <http://gsbsurvey.uchicago.edu/survey/parshantgoenka/Financial%20Literacy%20Quiz.poll.html>

Some Comparisons between GSB MBA Students and Participants in the Directors' College/Consortium [Chicago/Stanford/Wharton]

On Financial Literacy Quiz

Items Sorted from Worst to Best Performance by All DC Respondents	Directors' C. Respondents Before February 2005	Top 30 (of 155) UC MBA Students, Fall 2002
	Median Score(%)	Median Score(%)
Aggregated	28%	51%
Disaggregated.....	58%	77%
n=	1,466	30

Items Sorted from Worst to Best Performance by All DC Respondents

Topic	Entire 25-Item Quiz		13 Items from Final Exam		Classification of Item			Item No. on Quiz
	Correct		Correct		Basic [First - Year MBA Course]	Basic [Audit Committee]	Advanced	
	Number (out of 860)	Percentage	Number of 30)	(out Percentage				
Income Manipulation	71	5%	NA			x		23
Restructuring charges	83	6%	NA				x	6
SEC Mandates to Audit Committee	157	11%	NA			x		21
Barter Transactions	200	14%	NA				x	22
Special Purpose Entities	248	17%	NA				x	3
Materiality	181	12%	NA			x		24
Stock Options	393	27%	NA				x	13
Purchase Commitments	139	9%	9	30%	x			17
Statement of Cash Flows	490	33%	16	53%	x			9
Deferred Income Taxes	240	16%	4	13%	x			14
LIFO Accounting	414	28%	15	50%	x			4
Derivatives	386	26%	NA				x	16
Mandatory Reporting to Audit Committee	499	34%	NA				x	25
Operating Leases	406	28%	25	83%	x			12
Retained Earnings	578	39%	15	50%	x			20
Issue Shares for I.O.U	438	30%	NA				x	10
Reserves	532	36%	NA				x	18
Reserves	521	36%	NA				x	19
Goodwill	655	45%	11	37%	x			2
Marketable Securities	866	59%	17	57%	x			1
Equity Method	708	48%	29	97%	x			8
Impairment of Property, Plant, Equipment	589	40%	10	33%	x			5
Gains and Losses on Property, Plant, Equipment	702	48%	14	47%	x			7
Deferred Revenue	1081	74%	19	63%	x			11
Asset Impairment	1055	72%	18	60%	x			15