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Audit Committee Financial Literacy: What Might It Mean and Why Bother?*

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Abstract: We review the history of financial literacy, as it applies to public company audit committees; we report on a financial literacy quiz that we have given to over 1,400 members of corporate boards, not all audit committee members. 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, as 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. We also 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.

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Keywords: Financial literacy, corporate governance, audit committee

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Audit Committee Financial Literacy: What Might It Mean and Why Bother?

Roman L. Weil, Douglas J. Coates¹ and M. Laurentius Marais²

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.”³

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 It did not say what *financial literacy* means, other than to delegate the decision for any listed company to that company’s

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³ 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.

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

board. Aside from the Blue Ribbon recommendation specifically mentioning what we might call *accounting literacy*, listing requirements have not focused on accounting matters.⁵

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.⁶ The requirements for the ACFE do not necessarily imply accounting literacy, however, as they allow financial executives with no accounting experience to be the ACFE⁷.

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 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.

⁵ 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 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.

⁶ See Section 407 of the Act.

⁷ One can become a senior financial executive, CFO even, without having more than a first accounting course in accounting from an MBA program. Such executives have expertise in corporate finance, treasury functions, investment banking, but not accounting nor controllership, nor auditing.

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

The public accounting firms have a process for instructing their auditors how to deal with the requirement to assess the effectiveness of the audit committee in the context of internal control. PriceWaterhouseCoopers, 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 ...*

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 [CAPE]

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

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. We guess that how well-intentioned such credentialing efforts, they will fail on implementation grounds. Emphasis will focus on compliance, not knowledge as we suggest here, audit committee members should have.

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 involve judgments with material consequences. We base our criteria for financial literacy on the basic capabilities required for understanding those judgments, which the Appendix illustrates with excerpts from Kodak’s CAPE:

1. Understand the business model (the way the enterprise earns income) and how or why that business model requires the judgments and estimates in CAPE. In short: understand the transactions that require the judgments described.¹¹

Example: a firm that has more goods available for sale or use for a period than it sells or uses must allocate the cost of goods available for sale or use to cost of goods sold and ending inventory. Example: an insurance business model requires measurement of claims loss estimates (often called *reserves*). Example: selling on credit requires analyzing accounts receivable or impairments.

Test yourself: Do I know why these are the CAPE? What would be the next one to add to the list?

2. Understand the recognition and measurement guidance that GAAP and International Financial Reporting Standards [IFRS] provide for these CAPE.

What is the intent of the standard—that is, the reporting objective?

What judgments and estimates do the standards require and what do these standards attempt to achieve—the reporting objective?

Example: Why does *FAS 158*¹² require estimates of long-term rates of return in account-

¹¹ We think all board members, not just audit committee members, should understand how the enterprise earns income, which means that we think all board members should master this step.

¹² Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 158*, “Employers’ Accounting for Defined Benefit Pension Plans and Other Postretirement Plans.”

ing for pensions?

Do GAAP/IFRS provide a free choice? Example: Yes, for choosing among specific identification and LIFO or FIFO or weighted-average cost flow assumptions for inventory. Example: No, for choosing accounting treatment for leases, where GAAP/IFRS provide qualifying conditions for accounting methods.

Test yourself: Do I understand the qualifying conditions for my enterprise's use of hedge accounting? Or, of sales treatment for financial asset transfers? Or, of sales treatment of goods leased in capital leases?

3. Understand whether management's judgments/estimates described in CAPE are consistent with the business model, with the economic environment, and with objectives of the applicable guidance from GAAP/IFRS.

Example: The business model is to make mortgage loans with low initial interest rates and low down-payments; is the allowance for uncollectible loans consistent with the higher expected uncollectibles such loans imply as compared to more normal mortgage lending policies? Has the lender changed its methods as the rate of increase in housing prices has declined?

4. Understand the implications of management choices for *potential manipulation* of financial reporting, including both choices among methods under GAAP/IFRS and estimates required for the implementation of the methods.

Example: Did management make an estimate (or change an accounting method) to achieve a financial reporting objective—that is, meet an earnings target? Example: Did management, using LIFO, delay year-end purchases so that cost of goods sold would

decline relative to normal year-end purchasing behavior, increasing earnings by a few cents per share?

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, 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.”

Results of Financial Literacy Quiz

We have developed a multiple-choice quiz covering a variety of accounting and audit committee topics, which we have offered to over 2,000 attendees at the Chicago GSB, Stanford Law School, and Wharton multiple-day executive education sessions for board members. Over the past five 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 2 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.¹³ 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, at least about accounting matters. Perhaps our quiz is so difficult that you think an accounting literate board member needn't score more than 8 or 9 correct out of 25. We do not provide the quiz in this article, as we try to keep it from going into general circulation, hence ruining its use as a quiz.¹⁴ We gave the participants at the conference in November 2006 a copy of the questions, but not the answers

Survey of Efforts to Track or Improve Financial Literacy

In 2002, we sent a short questionnaire to audit committee chairs. The survey's most substantive questions 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?*

¹³ One of us can report that in over 40 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 it unlikely that those who have attended these sessions and chosen not to take the quiz would have done better than those who did.

¹⁴ If you want a copy of the quiz, write Roman.Weil@ChicagoGSB.edu. You will receive a copy of the quiz. If you want a copy of the answers, you have to take the quiz and send in your answers, as instructed on the cover page of the quiz.

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 committee members by looking at the background of the candidates and evaluating their academic and professional experience. Two responded that they do not assess financial literacy. Another two responded that they perform the assessment informally and gave no details of the assessment process. The remainder 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 evidence neither of formal training nor of 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.

Rating Audit Committee Potential for Financial Literacy

Where are we? We know that those who voluntarily take our quiz score low, even on basic

MBA-level accounting questions. What we can learn about the actual people who comprise audit committees today?

Scoring Individual Audit Committee Members

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 function, such as public accountant or controller, or provides some other clear indication of accounting expertise.

3 = Career path includes financial executive function, such as Treasurer or Investment Banker, but no explicit accounting functions.

2 = Career path includes non-financial business executive function, including CEOs without explicit accounting functions.

1 = Other career paths, such as non-business executive, academic without accounting function, not-for-profit executive, politician, diplomat, or former government bureaucrat. (In a handful of cases this code represents *None*, when we apply our ranking of the top three members of an audit committee to an occasional committee having fewer than three members).

We find readers 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.¹⁵ 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.¹⁶ In all, we have scored for this study the audit committees of approximately 300 companies, virtually all having at least three members. Thus, we scored more than 900 individual audit committee members.

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.

We rated the largest 50 companies' audit committees also for 1996, to collect data on whether the changes we observed between 2000 and 2004 merely continued trends or represented, in fact, a departure coinciding with the corporate scandals and new listing requirements.

Results

¹⁵ 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.

¹⁶ We view financial literacy ranking as lexicographic in the sense that one member with score 4 is better than five members with score 2.

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 includes the superscript “*” for Berkshire Hathaway, indicating that in 2000 the audit committee had only one member (whom we scored a 2, together with two scores of 1 representing “None”). 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 a cell count is marked with an asterisk). 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.¹⁷

Dow Chemical stands alone at the top of this list.¹⁸ 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 committee 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 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 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.¹⁹

Progress

¹⁷ 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.

¹⁸ One of its members receiving a score of 4 might be a 3. The member has never been an auditor or a controller, but has been on the board of the AICPA and a trustee of the Financial Accounting Foundation.

¹⁹ 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 perfect serial dependence. The chance that 37 independent events each with 98 percent of success will *all* have successful outcomes is $.98^{37}$, i.e., about 47.5 percent, which means the chance of at least one failure is about 52.5 percent.

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 score changes were indeterminate. There are 116 (= 93 + 23) audit committees changing clearly for the better or for the worse, among which 80 percent changed for the better. 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 under this null hypothesis 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 percent of the proportion of changes for the better.

Do the changes for the better arise only for the largest companies? No. We examined that question by creating a cross-classification, 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 (i.e., 82 percent) for the better and 10 for the worse. Based on these data, the two-sided p-value under the null hypothesis of equal probabilities is also less than .0001. Here also the proportion of changes for the better appears statistically significantly elevated. We do not show these data, which you can get from the authors.

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, paralleling Exhibit 1, for the 50 largest companies in our list between 1996 and 2000. You can get these data, too, from the authors, by writing us.

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 (i.e., 54 percent, compared to 80 and 82 percent in Exhibit 1) for the better and 13 for the worse. Based on these data, the two-sided p-value under the null hypothesis of equal probabilities is 0.850. These changes unlike those in Exhibit 1, indicate no statistically significant departure from equal probabilities of a change up and a change down.²⁰ In other words, behavior since the new listing requirements looks different.

Market Reaction to Audit Committee Potential for Financial Literacy

There is evidence that 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.

²⁰ The difference between the proportions of improvers in Exhibits 1 and 3 (80 and 54 percent) is highly statistically significant in a Fisher exact test, as is the between the proportions of improvers in Exhibits 2 and 3 (82 and 54 percent; p-values ≤ 0.01).

We partitioned those of our 300 companies having sufficient market data for our tests²¹ [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 declined²²; and a third, ignored group comprises the 10 companies whose score changes were indeterminate (such as a change from score of 322 to 421).²³ 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 2003.²⁴ Then we computed the average excess return for the 138 improvers separately from that of the 133 non-improvers, both overall and within subgroups based on the audit committee ratings for 2000. Exhibit 3 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

²¹ 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).

²² 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.

²³ 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.

²⁴ 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.

(= 46 + 54) companies started with scores of 311, 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 ($p = 0.01$).²⁵

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

What does it cost to improve the potential literacy of the audit committee? The out-of-pocket cost 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

²⁵ 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.

greater than the companies whose audit committees didn't improve. You can hire a lot of ex-Andersen partners for \$600 million per year.

Further Directions

Audit committee members appear not yet literate if by *financially 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.

We are now comparing the scores of audit committees of a matched sample of companies—those in options backdating trouble and those otherwise similar, which are not. We expect to find that those who are in trouble have audit committees with lower scores for potential financial literacy than the matched companies, who are not in trouble.

Should We Test Nominees for Audit Committee Membership?

Now that we know audit committee members are illiterate about accounting matters, the question naturally arises: should we have externally-imposed standards for audit committee membership? Yes, if we authors of this paper get to set the standards and become the gatekeepers. No, otherwise. We think nominating committees should choose their own audit committees. We can publicize the benefits to having literate members and let the self-interests of the board nominating committees take the matter from there.

Appendix. 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...."²⁶

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 do GAAP/IFRS provide among accounting methods and estimates for management 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. Why did management choose a LIFO cost flow assumption? 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 and can judge that such choice meshes with corporate policy.
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.

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.

²⁶ This sentence appears in Kodak's annual reports for all the years 2002-05 in the MD&A section.

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.

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Exhibit 1: Audit Committee Scores of 200 Largest Companies in 2000 and 2004

		Audit Committee Score in 2004																				
		111	211	221	222	311	321	322	331	332	333	411	421	422	431	432	433	441	442	443	444	n
Audit Committee Score in 2000	444																					
	443																			Dow		1
	442																					
	441																					
	433										Trav					3	1				Aetna	6
	432						IBM									4					Conoco	6
	431																					
	422				Citi					1					5		1					8
	421													{1,1*}	1							3
	411																					
	333								1		3	5					1	2				12
	332						3	2			13	2			4		3	2				29
	331									1		2										3
	322				7			20			13	4		Leh-man	7		4	4			Qwest	61
	321				2		1	5			1					1						10
	311																					
	222			CVS	21			14			3	2			3			3			Abbott	48
	221				3			3							1*		2					9
	211				BRKS*						Health-net	Wyeth										3
	111															MBNA						1
	n			1	35		5	45	1	35	17		1	22	3	18	12		1	4	200	

Notes:

		Color Coding	
No Change =	72	White	
Change Indeterminate =	12	Gray (or, in monochrome version, medium gray)	
Change for Better =	93	Blue (or, in monochrome version, dark gray)	
Change for Worse =	23	Yellow (or, in monochrome version, light gray)	
	<u>200</u>		

- The "Change Indeterminate" count includes three companies, marked with asterisks in the table, that had fewer than three audit committee members in 2000.
- The observed proportion of "more qualified" outcomes among the 116 classifiable changes was 80.2%. Specifying as our null hypothesis that, conditional on observing a classifiable change, changes for the better and for the worse are equally probable, the two-sided p-value based on these data is less than 0.0001.
- Potential for financial literacy was coded as follows: 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; and 1 = Career Path as non-business executive, academic without accounting function, not-for-profit executives, politicians, diplomats, government bureaucrats.
- For example, the entry "14" in row 222 and column 322 indicates that 14 audit committees scored 222 in 2000 and 322 in 2004. The entry "{1,1}" in row 421 and column 422 indicates that two companies were scored accordingly in 2000 and 2004, one of which had only two audit committee members in 2000, although 3 in 2004.

Exhibit 2
Results of Financial Literacy Quiz, 2002-2005

Chicago/Stanford/Wharton Directors' College/Consortium ["DC"] Participants' Performance on Schipper/Weil Financial Literacy Quiz Compared to That of GSB MBA Students

Topic (Ordered from Worst to Best Performance by All DC Participants on Corresponding Quiz Item)	Percent Correct		Level of Item		Item No. on Quiz
	DC Participants, on Entire 25-Item Quiz	MBA Students, on 13 Quiz Items Included in MBA Final Exam	Basic [Audit Committee]	Basic [First-Year MBA Course] Advanced	
Income Manipulation	5%		•		23
SEC Mandates to Audit Committee	11%		•		21
Materiality	12%		•		24
Mandatory Reporting to Audit Committee	34%		•		25
Purchase Commitments	9%	30%	•		17
Deferred Income Taxes	16%	13%	•		14
Operating Leases	28%	83%	•		12
LIFO Accounting	28%	50%	•		4
Statement of Cash Flows	33%	53%	•		9
Retained Earnings	39%	50%	•		20
Impairment of Property, Plant, Equipment	40%	33%	•		5
Goodwill	45%	37%	•		2
Gains and Losses on Property, Plant, Equipment	48%	47%	•		7
Equity Method	48%	97%	•		8
Marketable Securities	59%	57%	•		1
Asset Impairment	72%	60%	•		15
Deferred Revenue	74%	63%	•		11
Restructuring charges	6%			•	6
Barter Transactions	14%			•	22
Special Purpose Entities	17%			•	3
Derivatives	26%			•	16
Stock Options	27%			•	13
Issue Shares for I.O.U	30%			•	10
Reserves, Concepts	36%			•	18
Reserves, Measurement	36%			•	19
Median Score - Aggregated	28%	51%			
Median Score - Disaggregated	58%	77%			
<i>n</i>	1,466	30			

Notes:

Subjects included in the analysis were all DC Participants through February 2005, and top 30 (of 155) Fall 2002 UofC MBA Students. All quiz items are multiple choice questions. Many have more than one correct response. For such items, the instructions say, "indicate all that apply." We scored such items in two ways. In the "Aggregated" scoring, the quiz-taker would have to correctly give all that apply in order to receive credit for the item. If, for example, the item had four choices "that apply," but the answer shows only three, then we mark that answer as wrong. In the "Disaggregated" scoring, each of the multiple answers is treated like a separate true-false item and the answer for that each one is either right or wrong. If the item had four choices "that apply," and the answer shows three correct and one wrong, then we mark this as four questions, with the student getting credit for three out of four.

Exhibit 3

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 [1]	Improved [2]	Difference [3] = [2] - [1]	$(1 + [3])^{.25} - 1$ [4]
222 or worse	-33.27% (n=30)	-27.74% (n=53)	5.53%	1.35%
311-322	-33.43% (n=46)	-2.34% (n=54)	31.09%	7.00%
331-333	-26.85% (n=32)	37.15% (n=15)	64.00%	13.17%
411 or better	-22.24% (n=22)	-4.92% (n=9)	17.32%	4.07%
All	-30.02% (n=130)	-10.28% (n=131)	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.