
Original Article

Are all audit committee financial experts created equally?

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ABSTRACT There is little extant empirical research that classifies audit committee members based on expertise and independence simultaneously. Additionally, there is little empirical research where different types of gray audit committee members are considered separately. We find disclosure quality (as perceived by financial analysts) is positively related to the percentage of audit committee members who are affiliated with companies providing services to the firm and who are financial experts and negatively related to the percentage of audit committee members who are related to firm executives and who are financial experts. We also find that adding independent audit committee financial experts predates improvements in disclosure quality. As regulators around the world consider implementing audit committee requirements mandated in the United States, our results call into question disqualifying all gray directors from audit committees.

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INTRODUCTION

Accounting scandals at companies such as Cendant and Sunbeam led to increased scrutiny of corporate audit committees in the United States. This increased scrutiny arose at least partially because in the words of then chairman of the Securities and Exchange Commission

(SEC) Arthur Levitt, ‘... qualified, committed, independent, and tough-minded audit committees represent the most reliable guardians of the public interest’.¹ In February 1999, the Blue Ribbon Committee (BRC) on Improving the Effectiveness of Corporate Audit Committees issued its report detailing 10 recommendations for improving corporate audit committees. Among other changes, the BRC recommended that all audit committee members be independent of the firm and that at least one member possesses accounting or financial management expertise. Although the NYSE and Nasdaq adopted these recommendations, accounting scandals at firms

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such as Enron and WorldCom still occurred. This persuaded lawmakers that in order to restore investor confidence, legal (not regulatory) changes were necessary. In July 2002, the Sarbanes – Oxley Act (hereafter referred to as SOX) was signed into law. SOX contains several provisions designed to make audit committees more effective at monitoring financial reporting, effectively codifying into law many of the recommendations of the BRC.

Changes in audit committee requirements have not been limited to the United States. For example, Tafara² reports that since 2002: (1) Australia, Canada, Hong Kong, Mexico and the United Kingdom have all mandated that all audit committee members be independent; (2) China, France and Japan have all mandated that a majority of audit committee members be independent; (3) Germany has required that only the audit committee chairperson must be independent and (4) firms in Australia, Brazil, China, Germany, Hong Kong and the United Kingdom have to disclose whether at least one audit committee member is a financial expert. As the requirements in many countries are not as stringent as in the United States, regulators in those countries contemplating changing their audit committee requirements to mirror requirements in the United States can learn from the experience of firms in the United States. This research is an attempt to shed light on the impact of these audit committee requirements on disclosure quality.

Extant research, as will be detailed in the background section that follows, supports the notion that audit committee expertise and independence are positively related to financial reporting and disclosure quality. We extend this area of research in three ways. First, we classify audit committee members simultaneously based on their independence and expertise. That way, we obtain information concerning whether ‘independent experts’, ‘gray experts’ and ‘inside experts’ have similar relationships to disclosure quality. Second, we further classify ‘gray experts’ based on whether they are family members of current executives, former firm executives or affiliated with companies

providing services to the firm. In this way, we provide evidence of whether all gray audit committee experts should be excluded from audit committees. Third, by following the same firms over a period of years, we are able to test whether changes in audit committee composition predate changes in disclosure quality. This is the first paper we know to investigate changes in audit committee composition and changes in disclosure quality in a ‘lead-lag’ fashion. This is important for firms and shareholders, as extant research by Lang and Lundholm³ and by Sengupta⁴ has documented a negative relationship between our measure of disclosure quality and a firm’s cost of capital. If firms are able to enhance their disclosure quality by restructuring their audit committees, shareholders could benefit from lower costs of capital. Our evidence is also important to regulators throughout the world charged with improving disclosure quality in their capital markets. As regulators worldwide debate instituting audit committee reforms similar to those instituted in the United States, evidence about the impact of these changes can inform those debates.

After controlling for audit committee size, audit committee activity, institutional ownership and board composition, we find that disclosure quality (measured using analysts’ perceptions of firm disclosures from Association for Investment Management and Research (AIMR) reports) is positively related to the percentage of audit committee members who are affiliated with companies providing services to the firm and who are financial experts and negatively related to the percentage of audit committee members who are related to firm executives and who are financial experts. We do not find any relationship between disclosure quality and former firm executives who are financial experts, independent financial experts or inside financial experts. These results call into question excluding all gray directors from audit committees because audit committee experts having a business relationship with the firm seem to encourage greater, not reduced, financial transparency. In looking at changes in audit

committee expertise and changes in disclosure quality, we find that, consistent with SOX, additional independent audit committee financial experts predate improvements in disclosure quality. Overall, our results suggest that audit committees play an important role in ensuring the quality of firm disclosures, something that could possibly help a firm lower its cost of capital. Our results also suggest that regulators throughout the world should be cautious when considering implementing SOX-like audit committee requirements.

The rest of the paper is as follows. We first review prior literature related to our study and develop our hypotheses. Next, we describe the sample selection process and define the variables used in the paper. We then present our empirical results, followed by a discussion of the results. We close the paper by noting some limitations and offering some concluding comments.

BACKGROUND INFORMATION

Although audit committee characteristics have been the subject of much research, we limit our review to research concerning audit committee composition. The reader is directed to Cohen *et al*⁵ for a more comprehensive review of audit committee research.

Audit committee composition and the financial reporting process

Vicknair *et al*⁶ analyse the composition of audit committees and report that many NYSE firms have 'gray' directors on their audit committees. They suggest (but do not investigate) that this could affect the financial reporting process. Beasley and Salterio⁷ find that higher quality audit committees as measured by independence and knowledge (expertise) are associated with stronger boards. Scarbrough *et al*⁸ find that audit committees having no 'inside' members had more meetings with internal auditors and reviewed more of their work than did audit committees with one or more insiders. Abbott and Parker⁹ find that audit committees with no current managers of the firm as members and

that meet at least twice a year are more likely to hire an industry specialist external auditor. Raghunandan *et al*¹⁰ show that audit committees solely comprised independent directors and having at least one member with an accounting or finance background are more likely to have longer meetings with the chief internal auditor, meet privately with the chief internal auditor, review the internal auditing programme and results, and review management's interaction with internal auditing. Goodwin¹¹ reports that audit committees with higher independence meet more frequently, for longer duration, and more frequently in private with internal auditors and that audit committees with greater financial expertise more thoroughly review internal audit's work. Using audit committee members as subjects in an experiment, DeZoort and Salterio¹² document that independent audit committee members having relatively high audit knowledge are more likely to support the auditor in auditor-management disputes over accounting policy. McDaniel *et al*¹³ find that audit committee members with more expertise emphasise items that received less business press coverage but were more recurring in nature than do audit committee members with less expertise. Finally, Krishnan and Visvanathan¹⁴ report that as the percentage of financial experts on the audit committee increases, the likelihood of disclosing internal control weaknesses decreases. All these studies suggest that independent audit committee members and audit committee financial experts are positively related to factors expected to improve the financial reporting process. However, none directly investigate the association between audit committee member characteristics and financial reporting quality. Extant research investigating this issue will be discussed below.

Audit committee composition and financial reporting failures

Another stream of research analyses the relationship between audit committee composition and financial reporting quality in extreme



circumstances such as financial statement fraud and the issuance of going-concern reports. For example, Beasley¹⁵ finds the percentage of outside directors on the audit committee is lower for firms that committed financial statement fraud. Wright¹⁶ finds that firms subject to SEC Accounting and Auditing Enforcement Releases (AAERs) have significantly higher percentages of non-independent audit committee members than do a matched sample of control firms. Carcello and Neal¹⁷ find a negative relationship between the percentage of non-independent audit committee members and the likelihood of financially distressed firms receiving going-concern audit reports. In a study using firms from the technology, healthcare and financial services industries, Beasley *et al*¹⁸ find that firms committing fraud have less independent audit committees than do other firms in all three industries. Abbott *et al*¹⁹ show that restatements and being the subject of SEC AAERs are both less likely to occur in firms having audit committees with at least one financial expert and no non-independent members. Evidence from all these studies suggests that the lack of audit committee expertise and independence are both related to more frequent instances of financial reporting failures.

Audit committee composition and financial reporting quality

As most firms do not experience financial reporting failures, it is inappropriate to generalise results from studies investigating financial reporting failures to firms in general. To obtain evidence meaningful to firms in general, one needs to investigate situations that most (if not all) firms encounter. Wright¹⁶ documents a negative relationship between the presence of non-independent audit committee members and financial reporting quality as perceived by analysts. He also shows that after controlling for the proportion of inside and gray audit committee members, the composition of the non-audit committee members is unrelated to financial reporting quality. Klein²⁰ reports

a negative relationship between abnormal accruals and audit committee independence. Additionally, she finds a relationship between reductions in audit committee independence and increases in abnormal accruals. Bédard *et al*²¹ also use abnormal accruals to investigate audit committee composition and earnings management. They report that having at least one audit committee member with financial expertise decreases both positive and negative earnings management. Unlike Klein,²⁰ however, they find that only 100 per cent independent audit committees are negatively related to earnings management. The evidence from these less extreme situations indicates that audit committee independence and expertise are positively associated with financial reporting quality.

Firm value and audit committee composition

Two recent studies investigate stock market reactions to audit committee appointments. Davidson *et al*²² report a positive market reaction to appointments of financial experts to audit committees. They also report a larger positive response to the appointment of audit committee members with auditing expertise or audit firm experience versus those with expertise in corporate financial management, although they caution that the number of auditing or audit firm experts is relatively small. Defond *et al*²³ find positive stock market reactions to appointments of accounting financial experts, although the response is limited to firms having relatively strong corporate governance mechanisms. They find no response to appointments of non-accounting financial experts (this classification is consistent with the SEC's definition of an audit committee financial expert) or non-financial experts. In addition, they report a negative response to the appointment of non-independent accounting financial experts. However, as only five accounting financial experts in their sample are not independent, they caution against drawing any inferences from this result. Chan and Li²⁴ find a positive relationship between

the percentage of independent financial experts on a firm's audit committee and its Tobin's *Q*. Evidence from these studies supports the notion that market participants expect audit committee financial experts to improve financial reporting quality, resulting in an increase in firm value.

Background information summary

In general, extant audit committee research in a variety of settings has demonstrated that independent audit committee members and audit committee financial experts are both positively associated with activities that should improve a firm's financial reporting process and with financial reporting quality. Past research has also shown positive stock market reactions to appointments of audit committee financial experts. We extend this area of research in three ways. First, we classify audit committee members based on both their independence and their expertise, similarly to Defond *et al.*²³ That way, we obtain information concerning whether 'independent experts' and 'gray experts' have similar relationships to financial reporting quality. Second, since directors can be classified as 'gray' for various reasons (because of a family relationship with an executive, because the director formerly worked for the firm or because the director has a business relationship with the firm), we further classify gray directors based on 'why' they are classified as gray. By doing this, we are able to see if experts who: (1) used to work for the firm, (2) are related to firm executives or (3) have a business relationship with the firm all have similar relationships to financial reporting quality. Last, by following the same firms over a period of years, we are able to collect evidence concerning whether changes in audit committee composition pre-date changes in financial reporting quality.

HYPOTHESES DEVELOPMENT

Both the NYSE and Nasdaq require listed firms to have at least one financial expert on their audit committees. The implicit assumption is that having at least one financial expert

will improve the audit committee's oversight of financial reporting by enhancing its ability to ask the 'right questions' and identify potential red flags. Past research reviewed above^{10,11,13,14,19,21–24} supports this assumption.

SOX requires all audit committee members be independent of the firm. The implicit assumption is that independent audit committee members will provide better oversight because they are less likely to simply accept management's assertions. Inside audit committee members may be motivated to accept management's assertions because the CEO is their boss or because they personally made the decisions. Gray members may have this motivation in order to protect a business relationship with the firm, because they are related to a member of management, or because they are former firm executives. Protecting a business relationship is the reason some have questioned having Warren Buffett serve on Coca-Cola's audit committee.²⁵ Regardless of the specific motivation, disclosure quality may suffer if audit committee members fail to adequately question management. Results from previous studies reviewed above^{8–12,15,17–21,23,24} support these motivations. However, past studies do not differentiate between the different 'types' of gray audit committee members (family members of current executives, former firm executives or those who are affiliated with service providers). It is possible that different 'types' of gray audit committee members may have different relationships with disclosure quality. For example, committee members who are family members of current executives may have more motivation to simply accept assertions made by executives than do committee members who are affiliated with service providers. We classify gray directors into these types in order to investigate whether the different types have different relationships to disclosure quality.

Defond *et al.*²³ report a negative response to the appointment of non-independent accounting financial experts. They theorise that this negative reaction may result from market participants expecting these non-independent experts to have the motivation and knowledge to help disguise negative financial information. By extension, it is possible that independent



financial experts have both the knowledge and motivation to question management. This leads to the following three hypotheses:

Hypothesis 1a: There is a positive relationship between the percentage of independent audit committee financial experts and disclosure quality.

Hypothesis 2a: There is a negative relationship between the percentage of gray audit committee financial experts (as a group and for each 'type' of gray audit committee member) and disclosure quality.

Hypothesis 3a: There is a negative relationship between the percentage of inside audit committee financial experts and disclosure quality.

If these combinations of knowledge and motivation exist, it is possible that adding audit committee members with the knowledge and motivation to question management (not question management) will improve (reduce) disclosure quality. This leads to the following three hypotheses:

Hypothesis 1b: There is a positive relationship between changes in independent audit committee financial experts and subsequent changes in disclosure quality.

Hypothesis 2b: There is a negative relationship between changes in gray audit committee financial experts (as a group and for each 'type' of gray audit committee member) and subsequent changes in disclosure quality.

Hypothesis 3b: There is a negative relationship between changes in inside audit committee financial experts and subsequent changes in disclosure quality.

RESEARCH METHOD

Sample selection

Our sample consists of firms from the AIMR Review of Corporate Reporting Practices reports published in 1994, 1995 and 1997.^{26–28}

Table 1: Distribution of firms by industry^a

<i>Industry</i>	<i>N</i>
Airline	5
Electrical equipment	8
Food, beverage and tobacco	18
Health care	11
Insurance	14
Media	11
Natural gas companies	7
Paper and forest products	13
Petroleum	12
Precious metal mining	3
Railroad	3
Retail trade	16
Total	121

^aIndustry groupings are the same as used in AIMR reports.

Firms have to appear in all three reports to be included in the sample. This results in an initial sample of 148 firms. We exclude 18 firms because electronic copies of proxy statements are not available. We drop nine firms missing COMPUSTAT data. This results in a final sample of 121 firms in 12 industries. See Table 1 for a breakdown of the sample by industry.

Disclosure quality scores

Our dependent variable is the quality of firm disclosures as assessed by analysts and reported in AIMR reports. The overall goal of the AIMR reports is 'to improve corporate communications between the investment community and the management of publicly owned corporations in the United States and elsewhere'.^{26–28} AIMR uses a sub-committee of analysts familiar with an industry to evaluate the quality of information disclosed by firms in that industry. Although the specific items considered and the weights assigned to the items differ across industries, each industry sub-committee evaluates annual published information, quarterly and other voluntary published information, and information provided through the investor relations programme. Annual published information focuses

on the clarity and completeness of the firm's annual report, 10K, and 10Qs. Quarterly and other voluntary published information concerns a summary of the annual meeting, whether the firm issues separate fourth quarter reports, the clarity and timeliness of press releases, and whether the firm restates financial statements to reflect acquisitions and disposals. In assessing an investor relations programme, analysts assess the knowledge, candour, and accessibility of investor relations personnel, the frequency and quality of presentations to analysts, and whether the firm sponsors field trips and meetings for analysts. The total company score is a weighted average of the three component scores. Scores can range from 0 to 100, with higher scores indicating more informative disclosure as perceived by analysts. As not all industry sub-committees publish scores for the individual components, we use the firm's total score to measure disclosure quality. However, as discussed below, we do use the 'annual published information' component score as a robustness check and obtain qualitatively similar results.

AIMR scores represent the perceptions of analysts regarding disclosure quality, not actual disclosure quality. However, as analysts are sophisticated users of financial information and a firm's disclosures are evaluated by multiple analysts, we expect the scores to be unbiased. In addition, past research has shown higher AIMR scores to be related to lower costs of debt,⁴ narrower bid-ask spreads²⁹ and more accurate analyst earnings forecasts.³ As costs of debt, bid-ask spreads and earnings forecasts are all expected to improve as disclosure quality improves, AIMR scores seem to be reasonable proxies for disclosure quality. As firms in some industries may have to contend with more difficult reporting issues than do firms in other industries, we use industry-adjusted scores for our tests, consistent with past researchers using AIMR scores.^{3,30,31} We compute industry-adjusted AIMR scores as the firm's raw AIMR score divided by the average AIMR score in the firm's industry. We use the same industry classification system used by AIMR.

Explanatory variables

Our explanatory variables are based on whether an individual satisfies the SEC's definition of an 'audit committee financial expert' and the individual's independence status (independent, gray or inside). According to SEC regulations, an audit committee financial expert must be able to understand generally accepted accounting principles and financial statements, assess accounting estimates, accruals and reserves; understand the preparation, auditing and analysis of financial statements comparable in complexity to the firm's statements; understand internal controls and procedures; and understand audit committee functions. Audit committee members can obtain the necessary knowledge through education; work experience in public accounting; work experience in corporate accounting or as a financial officer; supervising accounting or finance personnel; work experience preparing, auditing or evaluating financial statements; or through other relevant experience.³² We classify audit committee members as financial experts if they have past employment experience in finance or accounting, requisite professional certification in accounting, or any other comparable experience or background which results in financial sophistication, including being or having been a CEO or other senior officer with financial oversight responsibilities. Consequently, CPAs; senior executives such as CEOs, CFOs and senior vice presidents; and managing partners of professional services firms are considered to be audit committee financial experts.

The SEC's definition of 'audit committee financial expert' encompasses more than technical accounting knowledge. This definition is consistent with AIMR's focus on the transparency of disclosures rather than on whether firms' accounting is technically correct. As CEOs and other senior executives are likely to be involved in disclosure decisions at their firms, our definition of 'audit committee financial expert' is consistent with our measure of 'disclosure quality'.

In determining independence, we classify audit committee members as inside if they are



currently employed by the firm. Gray audit committee members are individuals who are immediate family members of current firm executives, retired executives of the firm or affiliated with companies providing services to the firm (as partners, executives, directors or controlling shareholders). All other members are classified as independent. This classification is consistent with extant research on audit committee composition.^{15,20} Our explanatory variables are the percentage of audit committee members who are independent, gray and inside financial experts. In addition, we classify the gray audit committee experts based on the 'type' of relationship that calls their independence into question to further analyse the relationship between gray audit committee experts and disclosure quality.

We collect data on audit committee characteristics from proxy statements covering the 1992 and 1993 fiscal years, the 1994 and 1995 fiscal years, and the 1995 and 1996 fiscal years. We do this because an AIMR report overlaps 2 fiscal years. In our tests, we use the average value for each variable across the 2 years. Our results are qualitatively similar if we use values for the individual years.

Control variables

We include firm size as a control variable because larger firms may be able to devote more resources to financial reporting. In fact, Lang and Lundholm³⁰ do find a positive relationship between firm size and AIMR scores. Using COMPUSTAT data, we compute firm size as the natural log of a firm's market value of equity at the end of each fiscal year.

We also control for institutional ownership in our analysis. Institutional investors have a fiduciary responsibility to exercise due care in selecting firms to invest in and continually monitor and evaluate the performance of firms in their portfolios. Kim and Verrecchia³³ suggest that public financial disclosures may enhance the profit-making opportunities for sophisticated investors, and Bushee and Noe³¹ suggest that institutional investors could demand that firms make their disclosures more informative. Institutional owner-

ship could thus be positively related to disclosure quality. We calculate institutional ownership as the fraction of a firm's outstanding shares held by institutions as reported in the Standard & Poor's Stock Guide (measured as of the calendar year-end prior to the proxy filing date).

Audit committee size may be related to disclosure quality.³⁴ Past research by Jensen³⁵ and Yermack³⁶ suggests that smaller boards may be more effective. Similarly, Beasley¹⁵ finds that board size is positively related to the likelihood of financial statement fraud. In addition, Anderson *et al*³⁷ find a negative relationship between audit committee size and information contained in earnings. However, Anderson *et al*³⁸ report a negative relationship between bond yield spreads and audit committee size, suggesting that disclosure quality is higher for larger audit committees. Based on these conflicting results, we do not have an expectation concerning the direction of the relationship between audit committee size and disclosure quality.

Past research has shown that the number of audit committee meetings (as a proxy for audit committee activity) may be related to financial reporting quality. However, the evidence concerning the direction of the relationship is mixed. For example, Abbott *et al*¹⁹ find that restating firms hold fewer audit committee meetings, whereas Krishnan and Visvanathan¹⁴ find that firms reporting internal control weaknesses hold more meetings. To control for audit committee activity, we include the number of audit committee meetings in our analysis. However, we do not have an expectation concerning the direction of the relationship.

Even though audit committees are specifically charged by SOX with overseeing corporate financial reporting and a firm's management team ultimately prepares its disclosures, it is likely that a firm's board of directors at least influences this process. Anderson *et al*³⁷ and Cheng and Courtenay³⁹ both find that board independence is associated with more informative disclosures. In fact, Anderson *et al*³⁷ find that board independence outweighs audit committee independence. Beasley¹⁵ finds that firms committing

financial statement fraud have significantly smaller percentages of outside (non-executives) directors than do comparable firms not committing financial statement fraud. These studies demonstrate that board composition does seem to influence disclosure decisions. Consequently, we control for board composition in our tests. We expect disclosure quality to be positively related to independent directors and negatively related to gray and inside directors.⁴⁰

As only one of our sample firms did not have a Big Six auditor during the sample period, we do not control for auditor type in our tests.

EMPIRICAL RESULTS

Descriptive statistics⁴¹

The average market value of equity is approximately US\$11 628 million over the sample period. However, the median value is much smaller (\$4664 million), suggesting that our sample includes some small- and mid-sized firms. The average disclosure quality score is 74.87. On average, audit committees consist of 4.79 members and meet 3.33 times per year. Institutions own an average of 58.3 per cent of the equity in our sample firms. On average, there are 7.14 independent directors, 2.64 gray directors and 2.72 inside directors on the boards in our sample. Every firm in our sample has at least one financial expert on its audit committee, even though they were not required to under rules in effect at that time. On average, 55.1 per cent of audit committee members are classified as independent financial experts, 18.7 per cent are gray financial experts and 0.3 per cent are inside financial experts. The remaining 25.9 per cent of audit committee members are classified as not possessing financial expertise. A further breakdown of the 18.7 per cent gray financial experts shows: 0.5 per cent are relatives of current executives, 5.4 per cent are experts who worked for the firm in the past and 12.8 per cent are experts who are affiliated with companies providing services to the firm. Please see Table 2 for a summary of these descriptive statistics.

Pearson correlation coefficients are presented in Table 3. Industry-adjusted AIMR scores are positively correlated with firm size, audit committee size, the number of independent directors on the board, and the percentage of audit committee members who are experts and affiliated with companies that provide services to the firm and negatively correlated with the percentage of audit committee members who are experts and relatives of current firm executives and the percentage of audit committee members who are experts and former firm executives. Not surprisingly, many of the audit committee composition variables are correlated with each other and with the board composition variables. Multicollinearity is not likely to be a problem, however, as the highest variance inflation factor (2.2) is well below 5, the level that suggests multicollinearity is a problem.⁴²

Levels analysis

We test H1a–H3a while controlling for firm size, institutional ownership, audit committee size, the number of audit committee meetings and board of director composition. We also include dummy variables for 1995 and 1994 because we use data from three different time periods in our regression model. Our results do not change if we use dummy variables for 1992 and 1994, or if we use dummy variables for 1992 and 1995.

As shown in the first column of Table 4, disclosure quality is not significantly related to any of our main explanatory variables. However, when we classify the gray experts into the three categories, we find that disclosure quality is positively related to the percentage of audit committee members who are experts and affiliated with companies providing services to the firm (for example Warren Buffett) and negatively related to the percentage of audit committee members who are experts and family members of current executives. We find no significant relationship between disclosure quality and the percentage of independent or inside financial experts. Consequently, we find some support for H2a but do not support H1a and H3a.

**Table 2: Descriptive statistics**

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>
AIMR	74.87	76.50	13.57
MVE (\$ million)	11,628	4,664	18,941
ACSIZE	4.79	5.00	1.32
MEET	3.33	3.00	1.20
INSTP (%)	58.3	59.8	15.8
BRDIND	7.14	7.00	2.57
BRDGRY	2.64	2.00	1.98
BRDINS	2.72	2.00	1.59
INDPXPT (%)	55.1	58.6	25.6
GRAYXPT (%)	18.7	16.7	21.1
FAMXPT (%)	0.5	0.0	3.2
FMRXPT (%)	5.4	0.0	11.9
SVCXPT (%)	12.8	0.0	16.6
INSIDEXPT (%)	0.3	0.0	3.0

Notes: $N=363$ in all cases, except for MEET ($n=361$).

All figures are the average for the three AIMR report periods.

AIMR is raw financial reporting quality score from the appropriate AIMR report; MVE is the market value of equity at the end of the fiscal year; ACSIZE is the number of audit committee members; MEET is the number of audit committee meetings; INSTP is the percentage of common shares owned by institutions; BRDIND is the number of independent directors on the board; BRDGRY is the number of gray directors in the board; BRDINS is the number of insider directors on the board; INDPXPT is the percentage of independent audit committee financial experts on the audit committee; GRAYXPT is the percentage of gray audit committee financial experts on the audit committee; FAMXPT is the percentage of audit committee members who are relatives of current executives and financial experts; FMRXPT is the percentage of audit committee members who are former firm executives and financial experts; SVCXPT is the percentage of audit committee members who provide services to the firm and are financial experts; INSIDEXPT is the percentage of inside audit committee financial experts on the audit committee.

As expected, firm size is positively related to disclosure quality and the number of board insiders is negatively related to disclosure quality. We find that audit committee size is positively related to disclosure quality. As audit committees are rarely larger than five members, problems with large boards may not apply to audit committees. In addition, very small committees may constrain the resources available to the audit committee and adversely affect the quality of its oversight. The BRC report suggests⁴³ that given the complex and important nature of the audit committee's responsibilities, '... the committee merits significant director

resources, both in terms of the number of directors dedicated to the committee and the time each director devotes to committee matters'. No other control variables are significantly related to disclosure quality.

As we have three observations from each firm in our sample, it is likely that our regression model has some serial correlation. In fact, the Durbin – Watson test indicates that we do have some first-order serial correlation. To address this and to test whether our results are similar across all three AIMR report periods, we perform the same regression analysis separately for the three individual time periods. The results are similar,

**Table 3: Pearson correlation coefficients**

	SCORE	LN(MVE)	ACSIZE	MEET	INSTP	BRDIND	BRDGRY	BRDINS	INDPXPT	GRAYXPT	FAMXPT	FMRXPT	SVCXPT
LN(MVE)	0.172***												
ACSIZE	0.147***	0.215***											
MEET	0.038	0.093*	-0.021										
INSTP	0.068	0.080	0.113**	0.055									
BRDIND	0.130**	0.266***	0.328***	0.163***	0.269***								
BRDGRY	-0.005	-0.060	0.009	-0.077	-0.134**	-0.553***							
BRDINS	-0.084	0.216***	0.016	0.148***	-0.101*	-0.092*	-0.021						
INDPXPT	-0.010	0.037	0.100*	0.118**	0.093*	0.401***	-0.519***	-0.133**					
GRAYXPT	0.046	-0.067	-0.128**	0.049	-0.125**	-0.466***	0.584***	0.017	-0.616***				
FAMXPT	-0.265***	-0.039	0.055	0.082	0.005	-0.078	0.141***	0.128**	-0.106**	0.114**			
FMRXPT	-0.116**	-0.096*	-0.114**	0.084	-0.044	-0.302***	0.252***	0.130**	-0.399***	0.628***	0.090*		
SVCXPT	0.194***	-0.009	-0.092*	-0.014	-0.128**	-0.363***	0.536***	-0.097*	-0.479***	0.804***	-0.113**	0.066	
INSIDEXPT	-0.028	-0.035	-0.120**	0.022	-0.228***	-0.124**	-0.045	0.131**	-0.077	-0.081	-0.013	-0.041	-0.071

Notes: *, **, *** denote significance at the 10, 5, and 1 per cent levels, respectively. Variable definitions are the same as in Table 2 except for 'Score'.

Score is calculated as firm AIMR score/industry average AIMR score.

although the significance levels are lower.⁴⁴ Lower statistical power may explain these differences. The major difference is that the positive relationship between disclosure quality and the percentage of audit committee members who are experts and are affiliated with companies providing services to the firm is limited to the two later periods.

Lead-lag analysis

Although we expect that audit committee composition influences disclosure quality, the results above only demonstrate associations between these concepts. For example, firms with better disclosure may attract more service providers with financial expertise to their audit committees. To provide evidence concerning the direction of the relationship, we compare changes in audit committee composition between 1992–1993 and 1994–1995 with changes in disclosure quality between 1994–1995 and 1995–1996. Changes in audit committee variables pre-dating changes in disclosure quality support the notion that audit committee composition influences disclosure quality, rather than the other way around.

We compute the change in disclosure quality by dividing a firm's industry-adjusted AIMR score from 1995 to 1996 by its industry-adjusted AIMR score from 1994 to 1995. We compute changes in the audit committee variables by dividing changes in the individual variables by each firm's average audit committee size in 1992–1993. We do this to take into consideration that adding one independent expert to an audit committee of three people is likely to have a larger impact than adding one independent expert to an audit committee of five people, for example. In our sample, 39 firms added independent experts, 21 added gray financial experts, 0 firms added inside financial experts, 26 firms reduced independent experts, 18 reduced gray experts and 1 firm reduced inside experts.

We perform our tests while controlling for 1995–1996 firm size and for changes in board composition during the same time period. In Table 5, we show that changes in independent financial experts are positively related to changes



in disclosure quality. Changes in gray (in total or when looking at the three types of gray audit committee members) and inside financial expertise are not related to changes in disclosure quality. This evidence supports H1b but does not support H2b or H3b.⁴⁵ Although the overall model statistics (F -statistic and adjusted R^2 values) are somewhat weak, our evidence does indicate that adding independent audit committee financial experts leads to subsequent improvements in disclosure quality.

Robustness checks

As overall AIMR scores include an investor's relations component, these scores are not 'pure'

measures of disclosure quality. To address this issue, we perform our analyses while using the annual report component of the overall AIMR score as our dependent variable. This results in a loss of 16 firms (48 total observations). Our main results do not change. We also test the sensitivity of our results by measuring disclosure quality in the regression shown in Table 4 as a firm's raw score less the average score for its industry. Our results are qualitatively unchanged.

We classified members as audit committee financial experts based on the SEC's definition of 'financial expertise'. However, there has been some debate that this definition is too

Table 4: Results of regression of disclosure scores on audit committee expertise

$$\begin{aligned} \text{Score} = & a_1 + a_2\text{INDPXPT} + a_3\text{GRAYXPT} + a_4\text{FAMXPT} + a_5\text{FMRXPT} + a_6\text{SVCXPT} \\ & + a_7\text{INSIDEXPT} + a_8\text{LN(MVE)} + a_9\text{INSTP} + a_{10}\text{ACSIZE} + a_{11}\text{ACMEET} \\ & + a_{12}\text{BRDIND} + a_{13}\text{BRDGRY} + a_{14}\text{BRDINS} + a_{15}1995 + a_{16}1994 \end{aligned}$$

<i>Variable</i>	<i>Coefficient (t-statistic)</i>	<i>Coefficient (t-statistic)</i>
INDPXPT	-0.011 (-0.149)	-0.029 (-0.435)
GRYXPT	0.116 (1.534)	
FAMXPT		-0.232 (-4.477)***
FMRXPT		-0.064 (-1.120)
SVCXPT		0.213 (3.223)***
INSIDEXPT	0.030 (0.545)	0.024 (0.450)
LN(MVE)	0.161 (2.840)**	0.122 (2.268)**
INSTP	0.028 (0.514)	0.049 (0.933)
ACSIZE	0.103 (1.792)*	0.126 (2.312)**
ACMEET	0.024 (0.441)	0.055 (1.055)
BRDIND	0.078 (1.046)	0.061 (0.864)
BRDGRY	-0.021 (-0.278)	-0.034 (-0.476)
BRDINS	-0.133 (-2.342)**	-0.072 (-1.321)
1995	-0.054 (-0.880)	-0.068 (-1.178)
1994	-0.038 (-0.637)	-0.055 (-0.960)
<i>F</i> -statistic	2.199**	5.004***
Adjusted R^2	0.038	0.134

Notes: *, **, *** denote significance at the 10, 5, and 1 per cent levels, respectively.

Variable definitions are the same as for Table 2, except for 'Score', '1995' and '1994'.

Score is calculated as firm AIMR score/industry average AIMR score.

1995 and 1994 are indicator variables indicating whether an observation is from 1995 or 1994.

Table 5: Results of regressions of change in disclosure scores and changes in audit committee expertise

$$\begin{aligned} \text{Score} = & a_1 + a_2\text{CHGINDPXPT} + a_3\text{CHGGRAYXPT} \\ & + a_4\text{CHGFAMXPT} + a_5\text{CHGFMRXPT} \\ & + a_6\text{CHGSVCXPT} + a_7\text{CHGINSIDEXPT} \\ & + a_8\text{CHGBRDIND} + a_9\text{CHGBRDGRY} \\ & + a_{10}\text{CHGBRDINS} + a_{11}\text{LN(MVE95/96)} \end{aligned}$$

Variable	Coefficient (<i>t</i> -statistic)	Coefficient (<i>t</i> -statistic)
CHGINDPXPT	0.255 (2.715)***	0.255 (2.679)***
CHGGRAYXPT	0.092 (0.968)	
CHGFAMXPT		0.030 (0.332)
CHGFMRXPT		0.073 (0.746)
CHGSVCXPT		0.081 (0.799)
CHGINSIDEXPT	0.017 (0.187)	0.017 (0.189)
CHGBRDIND	-0.159 (-1.510)	-0.156 (-1.450)
CHGBRDGRY	0.105 (0.959)	0.108 (0.963)
CHGBRDINS	0.065 (0.671)	0.068 (0.687)
LN(MVE 95/96)	0.083 (0.905)	0.081 (0.883)
<i>F</i> -statistic	1.869*	1.434
Adjusted <i>R</i> ²	0.048	0.032

Notes: *, **, *** denote significance at the 10, 5, and 1 per cent levels, respectively.

LN(MVE95/96) is defined as in Table 2.

All audit committee change variables are calculated as follows: (value in 1994/1995 – value in 1992/1993)/average AC size in 1992/1993.

All board change variables are calculated as follows: (value in 1994/1995 – value in 1992/1993)/average board size in 1992/1993.

Score is calculated as follows: 1995 industry-adjusted AIMR score/1994 industry-adjusted AIMR score.

broad in that it results in classifying people possessing business expertise (CEO, COO, and so on) as financial experts. For example, Davidson *et al*²² and Defond *et al*²³ both find different stock market reactions to the appointment of ‘accounting’ experts versus the appointment of ‘business’ experts. To see if our results are driven

by business expertise, rather than accounting expertise, we replicate the regression in Table 4 classifying individuals as financial experts only if they have accounting degrees, accounting certifications, or current or past experience in accounting or finance (CFO, VP finance, controller, and so on). We test these relationships using percentage variables and indicator variables for all ‘accounting’ experts (regardless of independence) and for the different independence classifications. We find a positive relationship (at the 10 per cent level) between an indicator variable for an audit committee having at least one service provider who is an ‘accounting’ expert and disclosure quality. None of the other variables (percentage or indicator) is significant. A possible explanation for the general lack of a relationship is that AIMR scores assess the transparency of disclosures, not the appropriateness of accounting methods. As a result, AIMR scores are not enhanced by ‘pure’ accounting expertise. Rather, as senior officers are likely to be sensitive to the needs of analysts, their participation on audit committees enhances the transparency of firm disclosures. A second explanation could be a lack of statistical power. In our sample, only 17 firms have independent financial experts, 7 have gray financial experts (5 are service providers and 2 are former executives), and 3 have inside financial experts. There are no family members of current executives who are accounting experts in our sample.

DISCUSSION

Recent governance changes required by SOX and enacted by the NYSE and Nasdaq suggest that one way to enhance financial reporting is for audit committees to comprise at least one financial expert and no non-independent members. As regulators in other countries debate how to improve financial reporting quality, it is important to investigate whether these changes are related to improvements in financial reporting quality. Our results support some of these changes and argue against others.



For example, our results indicate that adding independent financial experts can improve disclosure quality. In addition, our results support the exclusion of financial experts who are family members of current executives from audit committees. However, our evidence supports including financial experts who are affiliated with companies providing services to the firm on audit committees (for example Warren Buffett on Coca-Cola's audit committee). One possible explanation for this result is that the business relationship that impairs independence helps the member assess the quality of corporate disclosures or provides insight into the types of information analysts would find helpful that independent members do not possess. Another possible explanation is that the apparent lack of independence does not lead to a lack of motivation to aggressively confront management concerning disclosures. These members may actually attempt to compensate for their lack of independence by more aggressively questioning management. Additionally, it is possible that business relationships do not impair independence to the extent that family relationships do.

Although our evidence suggests a 'preferred' audit committee structure, we believe some caution is warranted. In a survey of experienced auditors, Krishnamoorthy *et al*⁴⁶ report that more than 80 per cent of the respondents believed that more attention needs to be focused on the substance and not just the form of audit committees. We leave it to future research to determine whether the audit committee form indicated by our results improves actual audit committee effectiveness.

LIMITATIONS

Since the 1997 report is the last of these AIMR surveys, we cannot use more recent data. However, a benefit of using data from this time period is that the NYSE and Nasdaq have adopted similar requirements for audit committees of companies they regulate. Consequently, there is likely to be relatively little cross-sectional

variation in the composition of more recent audit committees, resulting in relatively little statistical power for our tests. This time period is also before the Blue Ribbon Commission issued its recommendations for audit committees. By reducing the likelihood that sample firms used their audit committees as symbolic attempts to conform to new mandates,²⁴ we reduce noise in our sample, improving the statistical power of our tests.

A second limitation is that our sample is limited to firms included in the AIMR reports. Although this may limit the generalisability of our results, our sample does include firms from 12 different industries, suggesting we have included a wide variety of firms in our analysis.

A third limitation is that our sample comprises only US firms. As noted above, regulators in many countries outside the United States have implemented similar rules concerning audit committee composition. Although our results support some of these changes and argue against others, it is important to take note of the differences in regulatory and cultural environments outside the United States. Because of these differences, what is effective in the United States may not be effective in the United Kingdom, for example. We leave it to future research to determine whether the relationships we observed for our US sample are valid for firms outside the United States.

CONCLUDING REMARKS

In an effort to enhance the quality of firm disclosures in the United States, the NYSE, Nasdaq and SEC have taken actions to force corporate boards to alter the composition of their audit committees. Audit committees now have to comprise at least three individuals, with all members independent of the firm and with at least one financial expert. There is little extant empirical research that classifies audit committee members based on expertise and independence simultaneously and that classifies gray directors based on the reason for the

possible lack of independence. Using a sample of firms that predates these requirements, we find a positive relationship between changes in independent audit committee financial experts and subsequent changes in analysts' perceptions of corporate disclosures. This is important for firms and shareholders, as extant research^{3,4} has documented a negative relationship between our measure of disclosure quality and a firm's cost of capital. In addition, our results indicate that disclosure quality is positively related to the percentage of audit committee financial experts who are affiliated with companies providing services to the firm and negatively related to the percentage of audit committee financial experts who are family members of current firm executives. Consequently, regulators throughout the world may not want to exclude directors who represent customers, suppliers or bankers from audit committees. However, family members of current executives should be disqualified from audit committees based on our results.

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