

**UNIVERSITY OF SOUTHERN QUEENSLAND**

AUDIT COMMITTEES AND FINANCIAL REPORTING QUALITY

A Dissertation submitted by

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## **Abstract**

This research investigated whether the formation of audit committees and their characteristics are associated with improved financial reporting quality. Modified versions of the models developed by Jones (1991) and Dechow and Dichev (2002) provided three measures of earnings quality, which were used to proxy for financial reporting quality. The audit committee characteristics investigated were: independence, expertise, activity, size and tenure.

Several contributions to knowledge are made by this research. First, this research examined the association between audit committee formation and financial reporting quality. This could not be done in many of the prior studies that used data on companies in the United States (Klein 2002a; Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and Courteau 2004; Vafeas 2005; Yang and Krishnan 2005; Dhaliwal, Naiker and Navissi 2006), where audit committees have been mandatory for companies listed on the New York Stock Exchange since 1978. A large number of public and private sector groups have recommended mandatory audit committee establishment for all Australian listed companies. However, there has been a lack of empirical support for these recommendations and this research provides evidence regarding this association.

Second, audit committees are more heavily regulated in the United States than Australia. Given the relative lack of audit committee regulation for Australian companies, Australia represented a richer empirical setting for the examination of the association between audit committee characteristics and financial reporting quality. The use of Australian company data for the selected time period, avoided the confounding effect of regulation on this association.

Third, this research used both a modified version of the traditional Jones (1991) discretionary accruals model and the more recently developed accrual estimation error model from Dechow and Dichev (2002) to estimate proxies for financial reporting quality. Most of the prior studies predominantly used the Jones (1991) model, which has been subject to criticism in the literature. Therefore, the use of multiple models provides more powerful tests of the association between audit committees and financial reporting quality. Finally, this research included changes tests in addition to cross-sectional tests to reduce the likelihood of problems with omitted variables.

Several conclusions can be drawn from the results. First, there was some evidence that earnings quality measured using the modified Jones (1991) model significantly reduced in the year following audit committee formation, thus providing some support for the notion that the formation of audit committees improves financial reporting quality. However, a comparison of these results with those of tests using earnings quality measures based on Dechow and Dichev (2002) indicates that audit committees appear more effective at reducing opportunistic earnings management, rather than total accrual estimation errors. Second, there was little evidence of a significant association between the characteristics of audit committees and improved financial reporting quality. Consequently, it can be suggested that, once audit committees are established, variations in their characteristics do not significantly affect financial reporting quality.

These conclusions provide support for the mandatory audit committee requirement under the Australian Stock Exchange (ASX) listing rules, which became effective from 1 January 2003. However, there are doubts over the usefulness of several aspects of the ASX Corporate Governance Council's recommendations concerning the composition and size of audit committees.

## **CERTIFICATION OF DISSERTATION**

I certify that the ideas, results, analyses and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

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Signature of Candidate

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Date

## **ENDORSEMENT**

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Signature of Supervisor

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Date

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# 1 Introduction

## 1.1 Purpose

The purpose of this research was to investigate the association between audit committees and financial reporting quality. Improving the quality of financial reporting practices has been widely proposed as one of the major benefits of companies establishing audit committees (Blue Ribbon Committee 1999; AARF, IIAA and AICD 2001; Ramsay 2001). However, despite the apparent widespread support for the benefits of audit committees, there has been very limited empirical research into the impact of their formation on financial reporting quality. Therefore, the first research question investigated in this research was:

*Is the formation of audit committees associated with improved financial reporting quality?*

Various review committees have recommended that a number of characteristics are important for an audit committee to effectively accomplish its objectives. These characteristics include: the overall independence and expertise of the audit committee; the level of its activity and its size. However, there are inconsistent results in the research literature on the association between these characteristics and financial reporting quality. Therefore, the second research question investigated in this research was:

*Are certain audit committee characteristics associated with improved financial reporting quality?*

## 1.2 Contributions

This research makes a number of key contributions to the literature on audit committees and financial reporting quality. First, this research examined the influence of the formation of audit committees on financial reporting quality using Australian company data. The impact of audit committee formation could not be investigated in many of the prior studies because of the use of data on companies from the United States (Klein 2002a; Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and

Courteau 2004; Vafeas 2005; Dhaliwal, Naiker and Navissi 2006). The mandatory audit committee requirement for NYSE listed companies has existed since 1978, for NASDAQ listed companies since 1989 and for companies listed on the American Stock Exchange since 1992 (McMullen 1996).

Wild (1994) and Jeon, Choi and Park (2004) are the only known published studies that examined the association between audit committee formation and financial reporting quality. Wild (1994) used data on a sample of US companies between 1966 and 1980. This study found a significant increase in the reaction of the market to earnings reports released after audit committee formation. For their sample of Korean companies in 2000 and 2001, Jeon, Choi and Park (2004) found no significant decrease in earnings management between the periods before and after audit committee formation. Given the apparent inconsistent results on the association between audit committee formation and financial reporting quality between these two studies, the examination of audit committee formation in this research provides further evidence on the ability of audit committees to improve financial reporting quality.

Second, the United States has had far more stringent audit committee regulations than Australia. Therefore, there is likely to be greater variation in audit committee characteristics among Australian companies than US companies. This research investigated the following audit committee characteristics: independence, expertise, activity, size and tenure. Based on surveys of annual report disclosures of Australia's top 250 companies in 2001, the *Horwath 2002 Corporate Governance Report* (Psaros and Seamer 2002, p. 21) concluded:

Clearly there is a wide range of governance practices occurring in corporate Australia. Some of the practices are outstanding; some are very poor.

Consequently, Australia represents a richer empirical setting for research into the association between audit committee characteristics and financial reporting quality. Research on this association using Australian company data is limited. The study by Davidson, Goodwin-Stewart and Kent (2005) is the only known published Australian study that has investigated this association.

Third, most prior studies used the Jones (1991) discretionary accruals model and some of its variations to develop proxy measures of earnings management and, inversely, earnings quality. However, as noted in section 3.5.2 of Chapter 3, this model has been the subject of considerable criticism (Dechow, Sloan and Sweeney

1995; Bernard and Skinner 1996; Guay, Kothari and Watts 1996; Hansen 1999; Larcker and Richardson 2004). Therefore, this research used both a version of the Jones (1991) model and the more recently developed accrual estimation error model by Dechow and Dichev (2002) to estimate three proxies for financial reporting quality. Accrual estimation errors arise when there is a difference between the accrual transaction and the associated cashflow. The higher the errors, the lower is the quality of accruals and therefore earnings (Dechow and Dichev 2002). The Dechow and Dichev (2002) model is becoming more widely used in earnings quality research (Xie, Xie and Xu 2003b; Francis et al. 2004; Aboody, Hughes and Liu 2005; Francis et al. 2005a; Francis, Nanda and Olsson 2005b; Francis, Olsson and Schipper 2005c; Dhaliwal, Naiker and Navissi 2006).

Finally, most of the prior studies used only cross-sectional data in their analysis of audit committees and financial reporting quality. Such tests potentially encounter the problem of omitted variables associated with both audit committees and financial reporting quality. This research sought to overcome this problem by conducting several changes tests across time, which regressed the changes in the earnings quality variables on changes in the audit committee variables. These tests are explained in section 3.7 of Chapter 3.

### **1.3 Motivations**

There are several main motivations behind the investigation of the association between audit committees and financial reporting quality. First, high profile corporate collapses in Australia and overseas have created considerable concern among investors and regulators about the quality of company's financial reporting practices. In an attempt to protect investors from financial scandals and to restore trust in corporate Australia, the ASX Corporate Governance Council released its report containing a set of principles of good corporate governance and best practice recommendations (ASX Corporate Governance Council 2003; Elliott and Roberts 2003). Therefore, audit committees and financial reporting quality are currently very topical issues.

Second, the results of this research will be useful to a number of groups. Regulators, such as the ASX, will find the results useful in assessing the effectiveness of some of the new audit committee listing rules. These rules came into effect from 1 January 2003. The new rules mandated that all entities in the S & P All Ordinaries

Index must have an audit committee and that all entities in the top 300 of the Index must comply with the ASX Corporate Governance Council's best practice recommendations regarding the composition, operation and responsibility of the audit committee (Australian Stock Exchange 2006b). The ASX Corporate Governance Council recently announced a review of its Principles of Good Corporate Governance and Best Practice Recommendations (Australian Stock Exchange 2006a). This further demonstrates the current and practical relevance of this research to regulators.

Finally, for those Australian companies currently without an audit committee, this research will assist them in deciding whether they should establish such a committee and the associated benefits. Furthermore, for those companies that already have an audit committee, the research contributes to their knowledge about whether certain characteristics can make their committees more effective. This information will be beneficial should the companies decide to restructure their audit committees in the future.

## **1.4 Definitions**

Definitions adopted by researchers are often not uniform. Therefore, key terms are defined in this section to establish the positions taken in this research. Definitions of the following terms are presented here: corporate governance; audit committees; financial reporting quality; earnings quality; and earnings management.

### Corporate governance:

Corporate governance has been defined by the ASX Corporate Governance Council (2003, p. 3) as:

The system by which companies are directed and managed. It influences how the objectives of the company are set and achieved, how risk is monitored and assessed, and how performance is optimised.

### Audit committees:

An audit committee is one example of a corporate governance control and has been defined as '...a committee of the board of directors and as such it assists the directors to discharge the board's responsibilities of oversight and corporate governance.' (AARF, IIAA and AICD 2001, p. 7). Best practice guidelines suggest that the responsibilities of audit committees should include: considering the appropriateness of the entity's accounting policies and principles; assessing significant

estimates and judgements in the financial reports; assessing information from internal and external auditors that affects the quality of financial reports; and asking the external auditor for an independent judgement about the appropriateness of the accounting principles used (AARF, IIAA and AICD 2001).

#### Financial reporting quality:

This research adopts the shareholder/investor protection perspective of financial reporting quality. This perspective was defined by Jonas and Blanchet (2000, p. 357), who stated that "...quality financial reporting is full and transparent financial information that is not designed to obfuscate or mislead users."

#### Earnings quality:

Earnings quality has been defined as "...the extent to which reported earnings faithfully represent Hicksian income." (Schipper and Vincent 2003, p. 98). Hicksian income is:

The amount that can be consumed (that is, paid out as dividends) during a period, while leaving the firm equally well off at the beginning and end of the period. (Schipper and Vincent 2003, p. 97).

The specific earnings quality constructs developed in this research are derived from the relations among income accruals and cash. Schipper and Vincent (2003) argued that the portion of accruals that is not manipulated and error free increases the extent to which accounting earnings faithfully represents Hicksian income.

#### Earnings management:

Healy and Wahlen (1999, p. 368) defined earnings management as occurring when:

Managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying performance of the company or to influence contractual outcomes that depend on reported accounting numbers.

Earnings management is viewed as having an inverse association with earnings quality (Schipper and Vincent 2003): the greater the extent of earnings management, the lower the quality of earnings and vice versa.

## **1.5 Institutional setting**

For many years in Australia, numerous public and private sector committees recommended that audit committees should become a mandatory requirement for all companies listed on the ASX. These include the Senate Standing Committee on Legal

and Constitutional Affairs (1989), the House of Representatives Standing Committee on Legal and Constitutional Affairs (1992), the Working Party of the Ministerial Council for Corporations (1997) and the Ramsay (2001) report.

However, the approach adopted by the ASX regarding audit committees from the early 1990s was one of mandatory disclosure. From 1 July 1993, the ASX introduced listing rule 3C(3)(i), which required all listed entities to disclose in their annual reports whether they had an audit committee. If they did not have such a committee, they needed to disclose the reasons why. Concerns were expressed in submissions to the ASX in response to its 1992 Exposure Draft, that a mandatory audit committee requirement would be burdensome for many listed companies (Australian Stock Exchange 1994). The ASX subsequently amended its listing rules by introducing listing rule 3C(3)(j), which applied for reporting periods ending on or after 30 June 1996. This rule required listed companies to include in their annual report a statement of the company's main corporate governance practices during the reporting period (Carson 1996).

In March 2003, the ASX Corporate Governance Council released a report containing a set of principles for good corporate governance and best practice recommendations (ASX Corporate Governance Council 2003). Best practice recommendation 4.2 stated that boards of directors should establish an audit committee (ASX Corporate Governance Council 2003). Following this recommendation, the ASX changed its listing rules from 1 January 2003. Listing rule 12.7 requires all entities in the S & P All Ordinaries Index at the beginning of their financial years, to have an audit committee during the year. Furthermore, under this rule all entities in the top 300 of the Index are required to comply with the ASX Corporate Governance Council's best practice recommendations relating to the composition, operation and responsibility of the audit committee (Australian Stock Exchange 2006b). Recommendation 4.3 (ASX Corporate Governance Council 2003) stated that the audit committee should consist of:

- only non-executive directors;
- a majority of independent directors;
- an independent chairperson who is not the board chairperson; and
- at least three members.

Recommendation 4.4 (ASX Corporate Governance Council 2003) stated that the audit committee should have a formal charter, which clearly sets out the committee's roles and responsibilities, composition, structure and membership requirements. ASX listing rule 4.10.3 also requires entities to include in their annual reports a statement disclosing the extent to which they have followed all of the best practice recommendations (Australian Stock Exchange 2006b). The ASX Corporate Governance Council recently called for submissions on a review of the principles of good corporate governance and the best practice recommendations (Australian Stock Exchange 2006a). The main objectives of an audit committee according to best practice guidelines include: improving the credibility and objectivity of the financial reporting process; improving the efficiency of the board of directors by delegating tasks to the committee; and facilitating the maintenance of the independence of the external auditor (AARF, IIAA and AICD 2001).

In the United States, there has been considerably more regulation of audit committees than in Australia. Since 1978, it has been a condition of listing on the New York Stock Exchange (NYSE) that all companies have an audit committee composed entirely of outside directors (Vanasco 1994). The NASDAQ exchange has mandated that all registrants in the National Market System have an audit committee since 1989. The American Stock Exchange (AMEX) has had a mandatory audit committee requirement for its listed companies since 1992 (McMullen 1996). In 1998, the NYSE and the National Association of Securities Dealers (NASD) co-sponsored a committee to study audit committee effectiveness. The Blue Ribbon Committee (1999) made numerous recommendations regarding the performance of audit committees. Most of the recommendations were adopted by the NYSE and the NASD. Both Exchanges now require listed companies to maintain audit committees with at least three directors, all of whom are independent of management (Klein 2003).

The Sarbanes-Oxley Act was passed by the US Congress in 2002 and is aimed at improving the financial reporting systems of public companies. The Act "...grants rights to and imposes obligations on the audit committee that previously it did not have." (Klein 2003, p. 347). The rights granted to audit committees under the Act include rights to: sufficient funding to perform their duties adequately; meet with the internal and external auditors separate from management; and funding for outside advisers (Savich 2006). Among the obligations imposed on audit committees under



the Act are the responsibility for the appointment, compensation and oversight of the work done by the external auditor (Klein 2003). The Act also requires that all audit committee members must be outside directors not employed by or associated with the company and each audit committee must have at least one member who is a financial expert (Savich 2006).

## **1.6 Delimitations of scope**

There are two main delimitations of scope placed on this research. First, the population from which the sample was drawn was all top 500 companies listed on the ASX in 2001. Top 500 companies were selected because of the wider availability of annual report information on the databases used for this research. Therefore, the results of this research may not be generalisable to smaller companies. Furthermore, 2001 was selected as the base year to avoid any effects of companies anticipating the new ASX listing rules on audit committees, which came into effect from 1 January 2003. In 2002, some companies may have restructured their audit committees in preparation for the new listing rules.

Second, only those companies that formed their audit committees after 1993 were included in the tests comparing financial reporting quality in the years before and after audit committee formation. This is because the original ASX listing rule requiring companies to disclose whether they had an audit committee came into effect from 1 July 1993. For companies forming their audit committees prior to this date, it was not possible to use their annual report disclosures to determine the year of audit committee formation. Consequently, the results may not be generalisable to companies that formed their audit committees prior to 1993.

## **1.7 Outline of the research**

Chapter 2 presents a review of the main streams of literature relevant to this research. First, prior research into corporate governance is reviewed with a discussion of research involving the board of directors, the external auditors and audit committees. The audit committee literature is covered in more detail as it is most closely related to this research. The specific areas of audit committee research covered relate to: audit committee formation, audit committee characteristics; and audit committee effectiveness. Second, the literature on financial reporting quality is

analysed. Specific areas covered are: perspectives of financial reporting quality; and methods of measuring financial reporting quality. Third, the prior research that has specifically examined the issue of audit committees and financial reporting quality is analysed. Finally, hypotheses are developed and justified.

Chapter 3 explains the research method that was used to test the hypotheses. First, there is a justification for the method chosen to measure financial reporting quality. Second, the population from which the sample was chosen and the sample selection methods used are explained. The data sources used in this research are also outlined. Third, there is an explanation of the measurement of the dependent variable. Fourth, the measurement of the independent variables, including the control variables, is discussed. Finally, the empirical tests used to test the hypotheses are detailed.

Chapter 4 analyses the results obtained from the empirical tests. First, there is a review of the population from which the sample was drawn, as well as an explanation of the samples that were used in the three groups of tests. Second, the results obtained from the tests on the formation of an audit committee and financial reporting quality are analysed. Second, the results of the regressions of financial reporting quality and the audit committee characteristics are evaluated. Finally, the regression results from the tests on changes in financial reporting quality and changes in audit committee characteristics are reviewed.

Chapter 5 presents the main conclusions and implications arising from the results. First, conclusions relating to the hypotheses are discussed as well as the conclusions for the overall research questions identified in section 1.1. Second, there is a discussion of the implications of these conclusions for both theory and practice. Third, limitations of this research are presented. Finally, a number of avenues for future research that arise from the limitations are discussed.

## 2 Literature Review and Hypotheses

### 2.1 Introduction

The main aims of this Chapter are to review the literature relevant to this research and to develop the hypotheses that are tested. The Chapter is organised as follows: section 2.2 restates the two research questions that were introduced in Chapter 1; section 2.3 reviews the prior corporate governance research in the areas of the board, the auditor and the audit committee; section 2.4 overviews the research on financial reporting quality in terms of its different perspectives and methods of measurement; section 2.5 reviews the prior literature on the association between audit committees and financial reporting quality; section 2.6 develops the hypotheses that were tested; and section 2.7 concludes the Chapter by summarising its main themes.

### 2.2 Research questions

The two research questions investigated in this research were:

*Is the formation of audit committees associated with improved financial reporting quality?*

*Are certain audit committee characteristics associated with improved financial reporting quality?*

### 2.3 Corporate governance literature

The two major streams of literature relevant to this research are corporate governance and financial reporting quality. Corporate governance research has mainly focussed on: the board of directors, the external auditor; and the audit committee. These groups have been identified as three of the major stakeholders in the corporate governance mosaic (Cohen, Krishnamoorthy and Wright 2004). This section provides an overview of the prior literature in these three areas, with the emphasis being on audit committee research, which most closely aligns with the major focus of this research.

### 2.3.1 Board literature

Prior research involving the board of directors has focussed on several areas. These include: the impact of the board on financial statement fraud and earnings management; the association between board and audit committee characteristics; the association between the board and firm performance; and determinants of board composition.

The impact of the board of directors on financial statement fraud has been investigated by several prior studies. Beasley (1996) performed logit regression analysis on 75 fraud firms and 75 no-fraud firms in the United States and found that the no-fraud firms had boards with significantly higher percentages of outside members than the fraud firms. Similarly, Dechow, Sloan and Sweeney (1996) found that firms manipulating their earnings through alleged violations of generally accepted accounting principles, were more likely to have boards of directors dominated by management. Using data on a sample of Australian companies that experienced financial statement fraud, Sharma (2004) found as the percentage of independent directors increased, the likelihood of fraud decreased. Taken together, these studies suggest that less independent boards of directors are likely to be associated with instances of financial statement fraud, which are extreme cases of poor quality financial reporting.

Other studies have analysed the association between characteristics of the board of directors and earnings management, which is a less extreme case of poor quality financial reporting. For example, the results of Peasnell, Pope and Young (2005) indicated that the likelihood of managers making income-increasing abnormal accruals was negatively related to the proportion of outside board members. Other studies in this area include Klein (2002a), Xie, Davidson and DaDalt (2003a), Davidson, Goodwin-Stewart and Kent (2005) and Vafeas (2005). These papers are discussed further in section 2.5.2. Overall, these studies provide support for the importance of the independence of the board in decreasing the likelihood of earnings management. The independence of the audit committee, which comprises board members, was one of the variables examined in this research.

Beasley and Salterio (2001) analysed the association between the characteristics of the board and the audit committee. Their results indicated that Canadian firms with more than the mandated minimum of outside directors on the

audit committee, had larger boards with more outside directors serving on them. Their study highlights the importance of the board of directors at influencing the composition of the audit committee. Therefore, this research included several board characteristics as control variables.

Numerous researchers have examined the association between the board of directors and firm performance (Baysinger and Butler 1985; Fosberg 1989; Schellenger, Wood and Tashakori 1989; Hermalin and Weisbach 1991). For example, Baysinger and Butler (1985) found that firms with higher proportions of independent directors in the early 1970s achieved superior performance later in the decade. Whereas, papers such as Zahra and Pearce (1989) and Bathala and Rao (1995) highlighted the inconsistent results in research examining the board of directors and firm performance. Therefore, the importance of the independence of board members to firm performance is questionable.

A number of prior studies have examined the issue of the determinants of board composition. For example, Hermalin and Weisbach (1988) found that firms added inside directors when the CEO neared retirement and that inside directors were more likely to leave the board after a firm performed poorly. Furthermore, Bathala and Rao (1995) found a systematic association between the proportion of external members on the board and variables such as managerial stock ownership, dividend payout and debt leverage. Hossain, Cahan and Adams (2000) found the percentage of outside directors was related to two of the four measures of investment opportunities they employed. Therefore, these prior studies indicate that a number of variables are associated with board independence.

### **2.3.2 Auditor literature**

There is a very large body of prior research that has examined various issues related to the external auditor<sup>1</sup>. As the focus of this research is on the association between audit committees and financial reporting quality, this section discusses the prior auditor research associated with the audit committee and financial reporting quality.

Prior research involving the auditor and audit committee can be categorised into research that has examined: auditor selection and switches; audit reporting; and

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<sup>1</sup> Cohen, Krishnamoorthy and Wright (2004) and Watkins, Hillison and Morecroft (2004) have provided more detailed reviews of this area of literature.

audit fees. Abbott and Parker (2000) studied auditor selection as one of the often noted functions of the audit committee. Their study found that firms more likely to use industry specialist auditors had audit committees not comprising employees and that met at least twice per year. Archambeault and DeZoort (2001) found that companies involved in suspicious auditor switches: were less likely to have an audit committee; had a smaller percentage of independent audit committee members; had fewer audit committee members with relevant experience; held fewer audit committee meetings; and had smaller audit committees. Similarly, Lee, Mande and Ortman (2004) found that the independence of both the audit committee and the board were negatively associated with the likelihood of an auditor-initiated switch. Therefore, prior research on auditor selection and switches has shown an association between these events and various characteristics of audit committees.

Another group of studies investigated the association between audit committees and audit reporting. For example, Monroe, Teh and Robinson (1995) found that companies with an audit committee received a significantly lower proportion of qualified audit reports than companies without an audit committee. More recent studies in the area of audit reports include Carcello and Neal (2000) whose results showed that the greater the percentage of affiliated audit committee directors, the lower the probability that the auditor would issue a going-concern audit report. In a related study, Carcello and Neal (2003a) analysed auditor dismissals following the issuance of going-concern audit reports from Big 6 audit firms. The study's results suggested that more independent audit committees with greater governance expertise and lower stockholdings could more effectively shield auditors from dismissal after a going-concern audit report was issued. The results of these studies suggest that audit committees have an impact on the audit reporting process.

Several other studies have focussed on the association between audit committees, audit fees and non-audit service (NAS) fees. Abbott et. al. (2003a) found that audit committee independence and financial expertise were significantly positively associated with audit fees. In a similar study, Abbott et. al. (2003b) found that more independent audit committees, meeting at least four times per year, were significantly negatively associated with the ratio of NAS fees to audit fees. In a recent Australian study, Goodwin-Stewart and Kent (2006) found that more frequent audit committee meetings were associated with higher audit fees. The audit committee's expertise was also associated with higher audit fees when meeting frequency and

independence was low. Overall, these provide evidence of an association between certain audit committee characteristics and audit fees.

Another group of auditor studies related to this research has examined the association between audit quality and financial reporting quality. Most of these studies used variations of the Jones (1991) discretionary accruals model to develop measures of earnings management to proxy for financial reporting quality. Both Becker et al. (1998) and Francis, Maydew and Sparks (1999) found that companies with Big 6 auditors had lower amounts of discretionary accruals than those audited by non-Big 6 auditors. A similar result was found in Chen, Lin and Zhou (2005) in the case of Taiwan IPO firms. Together, these results suggest that Big 6 audit firms can more effectively constrain earnings management than non-Big 6 audit firms. Similarly, both Balsam, Krishnan and Yang (2003) and Krishnan (2003) found support for the ability of industry specialist auditors to mitigate earnings management by their clients more than non-industry specialist auditors.

### **2.3.3 Audit committee literature**

This section reviews the prior literature on audit committees, which is a major focus of this research. The following specific areas are addressed: audit committee formation; audit committee characteristics; and audit committee effectiveness. The prior research on formation and characteristics is relevant because this research examines the association between the formation of an audit committee and its characteristics and financial reporting quality. The discussion on prior audit committee effectiveness research is relevant because it demonstrates several alternative approaches that have been used for examining the broad issue of audit committee effectiveness. This research used a different approach to examining this issue, i.e., by testing the association between audit committees and three proxy measures for financial reporting quality.

#### **2.3.3.1 Audit committee formation**

The first research question investigated by this research was "Is the formation of audit committees associated with improved financial reporting quality?" As discussed further in Chapter 3, the approach taken in answering this question was to examine whether financial reporting quality improved in the year following the formation of the audit committee. Therefore, it is

relevant to review the prior literature that has examined the issue of the formation of audit committees. This literature provides evidence of the variables found to be associated with audit committee formation.

Eichenseher and Shields (1985) argued that increased legal exposure for boards of directors created a trend toward audit committee formation and the movement toward Big-Eight auditors. The benefits of audit committee formation were expressed in terms of increased audit efficiency and providing evidence that the board had exercised due care in fulfilling its duties (Eichenseher and Shields 1985). They found that companies changing auditors were more likely to form an audit committee if the new auditor was a Big-Eight firm.

Several studies have used an agency theory framework to analyse the incentives for companies to form audit committees. Pincus, Rusbarsky and Wong (1989) found that companies voluntarily forming audit committees had a lower managerial ownership of shares than companies without audit committees. There was also support for the association between audit committee formation and company size, proportion of outside directors, a Big Eight auditor and participation in the National Market System. Using data on a sample of New Zealand companies, Bradbury (1990) found that the voluntary formation of an audit committee was related to the number of directors on the board and intercorporate ownership. However, variables such as the proportion and distribution of non-managerial ownership, financial leverage and company size were not significantly related to audit committee formation. Collier (1993) found support for the association between increased agency costs of debt and the voluntary formation of audit committees in his sample of UK companies. This result was not found in either of the two earlier studies. Collier (1993) speculated that the differences in results between the three studies could be explain by population and environmental factors. Consistent with Collier (1993), leverage was found to be significantly related to audit committee formation by Adams (1997). Chau and Leung (2006) found evidence of an association between audit committee existence and the level of family shareholding, the proportion of independent non-executive directors on the board and an independent chairman.

An Australian study that examined voluntary audit committee formation was Carson (2002). This study investigated a number of factors that were hypothesised to affect the presence of various board sub-committees including audit committees. The presence of an audit committee was found to be positively associated with the



existence of a Big 6 auditor and the number of intercorporate relationships of the directors on the board.

These prior studies have found that a number of variables were associated with the voluntary formation of audit committees. This information provides valuable insights into the circumstances where audit committees are more likely to be formed. However, it does not directly provide empirical evidence on the benefits obtained from companies forming audit committees. This research investigated whether the formation of an audit committee was associated with improved financial reporting quality. Therefore, it provides empirical evidence on one of the most widely suggested benefits of audit committee formation. The next section provides an overview of the prior research into various characteristics of audit committees.

### **2.3.3.2 Audit committee characteristics**

The second research question investigated by this research was “Are certain audit committee characteristics associated with improved financial reporting quality?” This relates to the issue of the effectiveness of the audit committee at completing one of its main suggested tasks, i.e., improving the quality of financial reporting. DeZoort et al. (2002) identified several characteristics that they believed contributed to the effectiveness of the audit committee. This section overviews the prior research on those characteristics identified by DeZoort et al. (2002), which were examined in this research, i.e., audit committee independence, expertise, and diligence.

#### Audit committee independence:

The independence of the audit committee has been widely researched in a variety of prior studies. It has been widely argued as being one of the key characteristics associated with the effectiveness of the audit committee. An early descriptive study on audit committee independence by Vicknair, Hickman and Carnes (1993) reported that approximately one third of the audit committee members in their sample of NYSE firms in the 1980s were classified as "grey" area directors. These directors included relatives of management, company consultants, interlocking directors and retired executives. They stated that the independence of such directors was subject to question (Vicknair, Hickman and Carnes 1993). Guy and Zeff (2002) expressed similar concerns about the appointment of retired audit partners to audit committees.

The determinants of audit committee independence were investigated in Klein (2002b). This study reported that the independence of the audit committee increased with board size and board independence and decreased with firms' growth opportunities and firms reporting consecutive losses. The significant results relating to the board variables highlight the importance of the board of directors' influence over the audit committee.

An Australian study that studied audit committee independence was Cotter and Silvester (2003). This study tested hypotheses on the association between board and monitoring committee independence on a number of agency variables as well as firm value. Their results documented a negative association between audit committee independence and leverage. The authors suggested that this result reflected reduced monitoring by debt-holders being compensated for by higher audit committee independence (Cotter and Silvester 2003).

Carcello and Neal (2003b) argued that audit committee independence was related to financial condition disclosures for companies experiencing financial distress. Specifically, they analysed the disclosures made in the financial statement notes and the management discussion and analysis to determine whether the disclosures were optimistic or non-optimistic about the companies' future survival. For companies experiencing financial distress, a significant positive association was found between the percentage of affiliated audit committee directors and the optimism of the going concern disclosures.

Several studies have investigated the link between audit committee independence, earnings management and earnings quality. These studies include Klein (2002a), Xie, Davidson and DaDalt (2003a), Choi, Jeon and Park (2004), Bedard, Chtourou and Courteau (2004), Van der Zahn and Tower (2004), Davidson, Goodwin-Stewart and Kent (2005), Vafeas (2005), Yang and Krishnan (2005) and Rahman and Ali (2006). These prior studies are closely related to the main focus of this research and are reviewed in section 2.5.2.

One paper that has been sceptical of the role of audit committees and the importance placed on their independence is Wolnizer (1995). This paper argued that:

Unless the establishment of audit committees is accompanied by changes in accounting and auditing practices such that the elements of financial statements can be authenticated by recourse to reliable or public evidence, it is unlikely that audit committees will lead to more reliable financial reporting (Wolnizer 1995, p. 45).

This argument is based in part on the view that independence is not sufficient alone to guarantee the reliability of a professional person's judgement. Wolnizer (1995) believed there was a need for changes to accounting and auditing rules to allow the objectives of audit committees to be fulfilled.

Overall, the prior literature has found that several variables are associated with audit committee independence. These variables include board size and board independence. The next section discusses another widely researched audit committee characteristic.

#### Audit committee expertise:

Audit committee expertise is another characteristic that has been linked to audit committee effectiveness and has received considerable attention in the prior literature. Several studies have conducted experiments or surveys to investigate this characteristic. DeZoort (1998) used an internal control oversight task with a group of audit committee members and a group of external auditors. The results revealed that audit committee members with experience made internal control judgements more like the auditors than members without experience. DeZoort and Salterio (2001) surveyed a sample of Canadian audit committee members to determine their reactions to a dispute between the auditor and corporate management. They found that higher support for the auditor by audit committee members was associated with greater independent director experience and greater audit-reporting knowledge. However, there was no significant association found between audit committee member judgement and financial-reporting knowledge. McDaniel, Martin and Maines (2002) carried out an experiment to investigate differences in judgements about financial reporting quality between financial experts and financial literates. The conclusions from the study included that the inclusion of financial experts on audit committees was likely to improve the consistency of assessments of overall reporting quality (McDaniel, Martin and Maines 2002).

Several other studies have adopted an archival approach in their examination of audit committee expertise. Davidson, Xie and Xu (2004) investigated stock returns around the time of appointment of audit committee members. The results showed significant stock price reactions when new audit committee members had financial expertise. Krishnan (2005) found that audit committees with financial expertise were

significantly less likely to be associated with the presence of internal control questions.

Another group of studies has analysed the association between the expertise of the audit committee, earnings management and earnings quality. These studies are closely related to this research and include Bedard, Chtourou and Courteau (2004), Choi, Jeon and Park (2004), Van der Zahn and Tower (2004), Vafeas (2005), Yang and Krishnan (2005), Dhaliwal, Naiker and Navissi (2006) and Rahman and Ali (2006). These prior studies are reviewed in section 2.5.2.

Some general conclusions can be drawn from the prior studies on audit committee expertise and experience. The survey and experimental literature have identified the importance of different forms of experience and expertise on various operational activities of the audit committee. Furthermore, the prior archival studies have found support for audit committee expertise contributing to improved stock returns, less internal control problems and less earnings management. The next section reviews the prior literature on audit committee diligence, which has also been widely researched.

#### Audit committee diligence:

The diligence<sup>2</sup> of the audit committee in carrying out its duties has also been linked to the audit committee's effectiveness. Several different proxies have been used in the literature for audit committee diligence. The most common proxy used has been the number of audit committee meetings per year. Two studies that have analysed meeting frequency in relation to its association with fraudulent financial reporting Abbott, Park and Parker (2000) and Beasley et al. (2000). Cases of financial statement fraud represent extreme cases of poor quality financial reporting. These studies are discussed further in section 2.5.1. Studies that have examined the association between meeting frequency, earnings management and earnings quality include Xie, Davidson and DaDalt (2003a), Bedard, Chtourou and Courteau (2004), Choi, Jeon and Park (2004), , Van der Zahn and Tower (2004), Davidson, Goodwin-Stewart and Kent (2005), Vafeas (2005), Yang and Krishnan (2005), and Rahman and Ali (2006) . These prior studies are reviewed in section 2.5.2.

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<sup>2</sup> Diligence is closely related to the level of audit committee activity, which was one of the audit committee characteristics examined in this research.

Audit committee meeting frequency has also been linked to various other audit committee and company variables. Menon and Williams (1994) used a sample of 200 companies to test for the association between audit committee activity and the following variables: management stockholdings; leverage; firm size; auditor size; proportion of outsiders on the board; and board size. The results indicated that audit committee meeting frequency was associated with the proportion of outside directors and firm size. Taking a similar approach, Collier and Gregory (1999) found that high quality auditors and leverage had a positive association with audit committee activity, while the inclusion of insiders on the audit committee was negatively related to activity. This study used both the number and duration of meetings to proxy for audit committee activity.

Another proxy for audit committee diligence that has been used in the literature is the voluntary disclosure of audit committee information in annual reports. Turpin and DeZoort (1998) studied the characteristics of a sample of US companies that voluntarily included a separate audit committee report (ACR) in their annual report. The findings showed that firms preparing an ACR were larger than firms that did not and that company management was generally responsible for the inclusion of the ACR in the annual report. Similarly, Carcello, Hermanson and Neal (2002) examined the disclosures in audit committee reports as required by the Securities and Exchange Commission in the United States. Voluntary disclosures in the reports were found to be more common for depository institutions, larger companies, companies listed on the New York Stock Exchange and companies with more independent audit committees.

In summary, the prior literature has used a number of different proxies for audit committee diligence, including the number of audit committee meetings and the voluntary annual report disclosure of audit committee information. The literature has also examined the link between diligence and issues such as fraudulent financial reporting, earnings management and various audit committee and company variables. The next section overviews the survey and field study literature on the broad issue of the effectiveness of audit committees.

### **2.3.3.3 Audit committee effectiveness**

The previous section presented an overview of the prior research into the major audit committee characteristics that have been suggested to contribute to audit

committee effectiveness. This section discusses several studies that have directly examined this issue through the use of survey and field study approaches.

Spangler and Braiotta (1990) sought to examine the issue of audit committee effectiveness in terms of the leadership styles of the chairpersons of audit committees. This study surveyed audit committee members, audit partners and senior company management. The results suggested that transformational leadership and active management by exception had a substantial impact on audit committee effectiveness.

Kalbers and Fogarty (1993) proposed that audit committee effectiveness was a function of the types and extent of audit committee power. A survey of audit committee representatives was conducted. Audit committee effectiveness was examined in terms of oversight roles relating to financial reporting, external auditors and internal control. The findings of the study indicated that effective audit committees required a strong organisational charter, institutional support and diligence. A follow-up study by Kalbers and Fogarty (1998) investigated agency theory and institutional theory explanations for audit committee effectiveness. Using data from Kalbers and Fogarty (1993), this study found that agency theory variables were not strongly linked to audit committee effectiveness. There was some support for a link between effectiveness and organisational bases of power for the audit committee.

In another survey study, Krishnamoorthy, Wright and Cohen (2002a) examined a number of issues related to audit committee effectiveness and financial reporting quality. This study surveyed audit partners and managers to gather their views on, amongst other things: the functions and responsibilities of audit committees and the factors and attributes that ensure audit committee effectiveness. A majority of the survey participants indicated that ensuring high quality accounting policies and financial reporting oversight were the most important functions of an audit committee. The participants also viewed audit committee members as only moderately effective in carrying out their financial reporting responsibilities.

Gendron, Bedard and Gosselin (2004) used a field study approach to investigate audit committee effectiveness. This study sought to analyse the following issues: the matters that audit committee members emphasise in meetings; how audit committee members evaluate these matters; and how audit committee members assess responses and comments from managers and auditors during meetings. Three Canadian public corporations were used as the basis for the field study. It was found

that audit committee members emphasised several key issues in meetings including: the accuracy of financial statements; the effectiveness of internal controls; and the quality of the audit work performed. Furthermore, they found that a key aspect of the audit committee's work was asking challenging questions of managers and auditors and assessing the responses.

While the survey and field study approaches have provided valuable insights into issues related to audit committee effectiveness, there are several inherent limitations associated with these approaches. First, there is often a low response rate from respondents representing difficulties in enlisting participation in such research. An implication of this is that if few responses are obtained from a given audit committee, the individual responses may not be generalisable to the audit committee itself (Spangler and Braiotta 1990).

Second, survey studies develop subjective measures of audit committee effectiveness because they are based on the perceptions of respondents. As Spangler and Braiotta (1990, p. 152) note, "Individual perceptual data may be unreliable and invalid due to individual respondents' tendency to be strict, lenient, or to avoid extreme responses." The biases and subjectivity of individuals can result in measures of audit committee effectiveness that do not accurately reflect the committees' overall performance. Members of the audit committees may tend to overstate their own effectiveness so as to portray themselves in the best light, while senior management may understate the committees' effectiveness if it has been critical of senior management (Spangler and Braiotta 1990). A limitation of the field study approach used in studies such as Gendron, Bedard and Gosselin (2004) is that only a very small number of companies is usually involved, which limits the generalisability of the results to other companies.

This research used an archival approach in its examination of the broad issue of the effectiveness of the audit committee. This involved gathering annual report data on a sample of companies to analyse the association between audit committees and financial reporting quality. The research method adopted is explained in more detail in Chapter 3. The next section reviews the literature on financial reporting quality.

## **2.4 Financial reporting quality**

The second major stream of relevant literature is research on financial reporting quality. This section first discusses different perspectives of financial reporting quality. Second, the different methods used in prior studies for measuring financial reporting quality are outlined.

### **2.4.1 Perspectives of financial reporting quality**

Jonas and Blanchet (2000) described the two general perspectives widely used in assessing the quality of financial reporting. The first perspective is based on the needs of users. Under this perspective, financial reporting quality is determined relative to the usefulness of the financial information to the users of the information. This approach is adopted in the Australian conceptual framework. SAC 2 Objective of General Purpose Financial Reporting states that the primary objective of general purpose financial reporting is to "...provide information to users that is useful for making and evaluating decisions about the allocation of scarce users" (CPA Australia 2006, p. 15). The AASB Framework explains the qualitative characteristics that make financial reporting information useful to users. These are the understandability, relevance, reliability and comparability of the information (CPA Australia 2006).

The second perspective of financial reporting quality is focussed on the notion of shareholder/investor protection. This perspective defines quality financial reporting as "...full and transparent financial information that is not designed to obfuscate or mislead users" (Jonas and Blanchet 2000, p. 357). Consistent with this perspective, the Australian Stock Exchange (ASX) has a statutory obligation to ensure that their markets are fair, orderly and transparent. Furthermore, the ASX has a program of market supervision that is aimed at achieving good disclosure, thereby seeking "...to empower the investor to make an informed judgement" (Australian Stock Exchange 2006c, p. 20). Arthur Levitt, former chairman of the Securities and Exchange Commission in the United States, stressed the importance of transparent, timely and reliable financial statements to the protection of investors (Levitt 1998).

There is a fundamental distinction between these two perspectives of financial reporting quality. The user needs perspective is mainly concerned with providing relevant information to users for making decisions, whereas the shareholder/investor protection perspective aims to ensure the information provided to users is sufficient for their needs, transparent and competent (Jonas and Blanchet 2000).



## 2.4.2 Methods of measuring financial reporting quality

A number of methods have been used in the research literature to empirically measure financial reporting quality. One broad method has been to use a variety of approaches to measure the quality of the earnings numbers reported in firms' financial reports. Under this method, the higher the quality of earnings, the higher is the overall financial reporting quality. As noted by Schipper and Vincent (2003), there is neither a widely agreed meaning given to the term "earnings quality", nor a generally accepted approach to measuring this concept.

This research used two empirical models to measure earnings quality. These models are explained in more detail in section 3.5 of Chapter 3. The first model used was a modified version of the Jones (1991) model of discretionary accruals. This model has been widely used in the literature to capture earnings management, which is viewed as an inverse measure of earnings quality (e.g. DeFond and Jambalvo 1994; Subramanyam 1996; Becker et al. 1998; Teoh, Welch and Wong 1998a; Francis, Maydew and Sparks 1999; Kasznik 1999; Bartov, Gul and Tsui 2001; Chung, Firth and Kim 2002; Frankel, Johnson and Nelson 2002; Balsam, Krishnan and Yang 2003; Chung and Kallapur 2003; Gul, Chen and Tsui 2003; Koh 2003; Krishnan 2003; Dowdell and Krishnan 2004; Chen, Lin and Zhou 2005).

Earnings management has been defined by Healey and Wahlen (1999, p. 368) as:

Earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying performance of the company or to influence contractual outcomes that depend on reported accounting numbers.

Similarly, Schipper (1989, p. 92) defined earnings management as "...a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain."

These definitions take an opportunistic view of earnings management, whereby the intent of management is to obtain some private gain by misleading stakeholders or influencing contractual outcomes. Therefore, under this perspective, earnings management negatively impacts on the quality of earnings, i.e., the greater the earnings management, the lower the earnings quality and vice versa. If earnings were managed opportunistically, the reported earnings number and the overall financial reports would be of a lower quality. This relates to both perspectives of

financial reporting quality from Jonas and Blanchet (2000), as opportunistic earnings management both decreases the usefulness of the financial information for users (the user needs perspective) and misleads users (the shareholder/investor protection perspective). An alternative view is that earnings are managed to allow managers to reveal more private information to users about the financial reports (Schipper 1989; Healy and Wahlen 1999).

The second model used to measure earnings quality was the Dechow and Dichev (2002) model. This model argues that estimation errors in accruals and subsequent corrections of these errors, decreases the quality of accruals and earnings. However, unlike the Jones (1991) type models of discretionary accruals that "...focus on the opportunistic use of accruals to window-dress and mislead users of financial statements", no attempt is made to separate the intentional from the unintentional accrual estimation errors (Dechow and Dichev 2002, p. 36). This is because both types of errors imply low quality accruals and, therefore, earnings. Therefore, while the Jones (1991) model assumes that accruals and earnings quality is only affected by management intent to manipulate, the Dechow and Dichev (2002) measure of earnings quality incorporates both intentional and unintentional estimation errors in accruals. Intentional errors arise from incentives to manage earnings and would be similar to opportunistic earnings management proxied by the Jones (1991) model. Unintentional errors arise from management lapses and environmental uncertainty (Francis et al. 2005a).

Several recent papers have used the Dechow and Dichev (2002) model as part of their empirical tests. First, Xie, Xie and Xu (2003b) examined the association between earnings quality and audit committee monitoring service, which was proxied by the frequency of annual audit committee meetings. Second, Dhaliwal, Naiker and Navissi (2006) investigated the association between three types of audit committee financial expertise and accruals quality. Other recent papers that have used the Dechow and Dichev (2002) model include: Francis et al. (2005a) who investigated the pricing of accruals quality by investors; Francis et al. (2004) who examined the association between the cost of equity capital and seven earnings attributes, which included accruals quality; Francis, Nanda and Olsson (2005b) who studied the relations among voluntary disclosure, information quality and costs of capital; Francis, Olsson and Schipper (2005c) who analysed the link between financial reporting choices affecting accruals quality and firms' use of call options; and

Aboody, Hughes and Liu (2005) who examined the association between earnings quality, insider trading and the cost of capital.

A number of other approaches have been used in prior studies to measure the quality of earnings. Wild (1994) measured earnings quality as the informativeness of earnings reports before and after audit committee formation. Informativeness was measured by the extent of market reaction to the release of the earnings reports. Earnings quality was measured by Vafeas (2005) using the existence of small earnings increases and the avoidance of negative earnings surprises.

Apart from earnings quality, several other methods have been used in the literature to measure overall financial reporting quality. A number of studies have surveyed different groups of stakeholders such as investors (Hodge 2003) and auditors (Krishnamoorthy, Wright and Cohen 2002b) to gather their perceptions of the quality of earnings and financial reporting. Felo, Krishnamurthy and Solieri (2003) used analysts ratings from the Association for Investment Management and Research to measure financial reporting quality. These ratings are based on evaluations by sub-committees of analysts of the quality of annual published information, quarterly and other published information and information provided through the investor relations program. A similar approach was used in studies such as Lang and Lundholm (1993; 1996).

## **2.5 Audit committees and financial reporting quality literature**

Sections 2.3 and 2.4 of this Chapter discuss the two major streams of prior literature related to this research, i.e., corporate governance and financial reporting quality. This section draws these two streams together by presenting an overview of the literature that has investigated the association between various aspects of audit committees and financial reporting quality. Section 2.5.1 discusses the prior studies on audit committees and financial statement fraud, which can be viewed as extreme cases of poor quality financial reporting. Section 2.5.2 presents an overview of the prior research into audit committees and earnings management. As noted above, earnings management has been widely used as an inverse measure of earnings quality and, therefore, financial reporting quality. Section 2.5.2 also overviews several prior studies on the association between audit committees and other measures of earnings quality.

### **2.5.1 Audit committees and financial statement fraud**

Numerous studies have analysed the link between audit committees and instances of financial statement fraud. Dechow, Sloan and Sweeney (1996) investigated companies subject to accounting enforcement actions by the Securities and Exchange Commission for alleged breaches of Generally Accepted Accounting Principles. They found that companies that were manipulating their earnings were less likely to have an audit committee. McMullen (1996) examined five potential consequences of audit committees involving the occurrence of errors, irregularities and illegal acts relating to financial reporting. Her findings showed that companies with more reliable financial reporting were more likely to have audit committees. However, in his analysis of fraud firms and no-fraud firms, Beasley (1996) found that the presence of an audit committee did not significantly affect the likelihood of financial statement fraud.

While the studies discussed in the previous paragraph primarily tested the existence of an audit committee, several other studies have examined various audit committee characteristics and their association with cases of fraud. Beasley et al. (2000) looked at differences in corporate governance between fraud and no-fraud companies. They found that fraud companies in certain industries had less independent audit committees and fewer audit committee meetings. In a similar study, Abbott, Park and Parker (2000) found that firms with audit committees comprised of independent directors and that met at least twice a year were less likely to be sanctioned for fraudulent or misleading financial reporting. The findings of the study of UK audit committees by Song and Windram (2004) suggested that the financial literacy of audit committees and their activity level contributed to the probability of companies complying with financial reporting standards. Abbott, Parker and Peters (2004) examined instances of companies restating their annual results and found a significant association between the independence and activity level of the audit committee and the occurrence of restatements. In a similar study, Lin, Li and Yang (2006) analysed the association between the occurrence of earnings restatements and audit committee characteristics. Only the size of the audit committee was significantly negatively associated with earnings restatements.

A number of other studies have focussed more on the characteristics of the board and auditor and their association with fraudulent financial reporting. Using data

on cases of fraud in Australia, Sharma (2004) found that the likelihood of fraud decreased as the percentage of independent directors on the board increased. Carcello and Nagy (2004) found a significant negative association between auditor industry specialisation and client financial fraud, but the association was weaker for larger clients.

In summary, there have been some mixed results in the literature on the association between the existence of audit committees and cases of financial statement fraud. While Dechow, Sloan and Sweeney (1996) and McMullen (1996) found evidence of an association between these variables, Beasley (1996) did not identify such an association. Furthermore, the following audit committee characteristics have been found to be significantly associated with financial statement fraud or earnings restatements: independence (Abbott, Park and Parker 2000; Beasley et al. 2000; Abbott, Parker and Peters 2004); activity (Abbott, Park and Parker 2000; Beasley et al. 2000; Abbott, Parker and Peters 2004; Song and Windram 2004); expertise (Song and Windram 2004); and size (Lin, Li and Yang 2006).

### **2.5.2 Audit committees, earnings management and earnings quality**

A number of prior studies have analysed the association between audit committees and earnings management or other measures of earnings quality (Klein 2002a; Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Jeon, Choi and Park 2004; Van der Zahn and Tower 2004; Davidson, Goodwin-Stewart and Kent 2005; Vafeas 2005; Yang and Krishnan 2005; Dhaliwal, Naiker and Navissi 2006; Rahman and Ali 2006). Table 2.1 below presents a summary of each of these studies.

**Table 2.1 Summary of prior studies on audit committees, earnings management and earnings quality**

<b>Author(s)</b>	<b>Sample</b>	<b>Dependent Variable</b>	<b>Independent variables</b>	<b>Results</b>
Klein (2002a)	692 firm-years from the US S&P 500 Index in 1992 and 1993.	Absolute values of abnormal accruals calculated from a cross sectional version of the Jones (1991) model.	Measures of audit committee and board independence and various control variables.	Firms with boards and/or audit committees with less than a majority of independent directors were more likely to have larger absolute abnormal accruals. There was no evidence of a systematic association between an all-independent audit committee and abnormal accruals. Firms changing their board or audit committees from having a majority to a minority of outside directors experienced large increases in absolute abnormal accruals.
Xie, Davidson and DaDalt (2003a)	282 firm-years from the US S&P 500 Index in 1992, 1994 and 1996.	Discretionary current accruals calculated from a cross sectional version of the Jones (1991) model adjusted by Teoh, Welch and Wong (1998a).	CEO duality, number of board meetings, number of audit committee meetings, measures of board and audit committee independence, measures of board and audit committee composition, and various control variables.	Earnings management was less likely to occur in companies whose boards include both more independent directors and directors with corporate experience. Composition of the audit committee was associated with the level of earnings management. There was an association between lower levels of earnings management and the

				meeting frequency of boards and audit committees.
Choi, Jeon and Park (2004)	116 firm-years from the Korean Stock Exchange in 2000 and 2001.	Discretionary accruals calculated from a cross sectional version of the Jones (1991) model.	Measures of audit committee independence, competency and activity, audit committee size and various control variables.	Audit committee members' shareholdings were positively associated with earnings management. The presence of professors or employees of financial institutions on the audit committee was negatively associated with earnings management.
Jeon, Choi and Park (2004)	116 firm-years from the Korean Stock Exchange in 2000 and 2001.	Discretionary accruals calculated from a cross sectional version of the modified Jones (1991) model (Dechow, Sloan and Sweeney 1995).	Audit committee formation.	There was no significant decrease in earnings management for firms that established audit committees between the periods before and after establishment.
Van der Zahn and Tower (2004)	485 firm-years from the Singapore Stock Exchange in 2000 and 2001.	Discretionary accruals calculated from a cross sectional version of the Jones (1991) model.	Audit committee independence, audit committee expertise, number of audit committee meetings and various control variables.	Firms with a higher proportion of independent audit committee members were more effective at reducing earnings management. There was no significant association between the magnitude of earnings management and the level of an audit committee's financial expertise amongst its independent directors. There was strong evidence that more active

				audit committees were more effective at constraining earnings management.
Bedard, Chtourou and Courteau (2004)	300 firm-years from the US Compustat database in 1996.	Abnormal accruals calculated from the cross sectional version of the modified Jones (1991) model (DeFond and Jiambalvo 1994; Becker et al. 1998).	Measures of audit committee expertise, independence and activity and various control variables.	The presence of a financial expert on the audit committee, a committee composed solely of independent directors, and a clear mandate to oversee the financial reporting process and the audit were negatively related to the likelihood of aggressive earnings management. There was a negative association between governance expertise and the likelihood of aggressive earnings management. There was no significant association between either the size of the audit committee, the frequency of its meetings or the firm-specific expertise of its members with the likelihood of aggressive earnings management.
Davidson, Goodwin-Stewart and Kent (2005)	434 firms listed on the Australian Stock Exchange in 2000.	Discretionary accruals calculated from the cross sectional version of the modified Jones (1991) model (DeFond and Jiambalvo 1994; Becker et al. 1998).	Measures of board and audit committee independence, number of audit committee meetings, audit committee size,	There was a significant negative relation between earnings management and a board comprised of a majority of non-executive directors. There was support for an association



			outsourcing of the internal audit function and auditor size.	between an audit committee comprising a majority of non-executives and a reduction in earnings management. There was no support for an association between the presence of an internal audit function or choice of a Big 5 auditor and earnings management.
Yang and Krishnan (2005)	896 firm year observations from the US Compustat database between 1996-2000.	Total discretionary accruals calculated from the cross-sectional Jones (1991) model; and current discretionary accruals based on Teoh, Wong and Rao (1998b).	Audit committee independence, number of meetings, financial expertise, stock ownership, outside directorships, tenure and number of directors.	No significant association was found between either audit committee independence or audit committee financial expertise and quarterly discretionary accruals; the number of outside directorships held by audit committee directors was negatively associated with quarterly discretionary accruals; stock ownership by independent audit committee directors was positively associated with earnings management; and the average tenure of audit committee directors was negatively associated with quarterly earnings management.
Dhaliwal, Naiker and Navissi (2006)	1,114 firm years from the US Compustat	Accruals quality derived from a modified version of	Measures of audit committee expertise;	There was a significant positive relation between accounting

	database between 1995 and 1998.	the Dechow and Dichev (2002) model as suggested by McNichols (2002).	audit committee governance score based on audit committee size, audit committee independence and audit committee meetings; board governance score based on board size, board independence, share ownership and CEO-Chair duality; and various control variables.	expertise in audit committees and accruals quality, but no significant association between accruals quality and the presence of finance or supervisory expertise in audit committees. The positive association between audit committees with accounting expertise and accruals quality was more pronounced in the presence of strong audit committee governance.
Vafeas (2005)	252 US firms between 1994 and 2000.	Small earnings increases and avoiding negative earnings surprises.	Measures of audit committee independence, experience, size, meetings, stock ownership, member tenure, directorships and committee memberships of members; board inside ownership, board independence and board size; and various control variables.	Audit committee insiders are associated with lower earnings quality. Audit committee meeting frequency is associated with higher earnings quality. Committee member experience in other committees is associated with fewer small earnings increases. Equity incentives increase, and length of board tenure decreases, earnings quality as measured by the avoidance of negative earnings surprises.
Rahman and Ali (2006)	97 firms listed on the Main Board of Bursa	Abnormal working capital accruals derived from the	Measures of audit committee independence,	Earnings management is positively related to board size.

	Malaysia over the period 2002-2003.	cross-sectional modified Jones (1991) model.	competence and meeting frequency; board independence, board member tenure, CEO duality and board size; corporate ownership; cultural characteristics; and various control variables.	There were insignificant relations between board independence and audit committee independence and earnings management. The study also found that ethnicity had no effect in mitigating earnings management.
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The majority of these studies used data on companies in the United States, with the remainder using data from several Asian countries, as well as Australia. Audit committees in countries such as Australia have been less heavily regulated than in the United States. Therefore, the use of Australian company data in this research allowed for the examination of the association between audit committees and financial reporting quality without the confounding effect of regulation.

The only known published study that has directly examined the association between the formation of audit committees, earnings management and, inversely, earnings quality is Jeon, Choi and Park (2004). This study used data on a sample of Korean companies in 2000 and 2001 to examine whether audit committee formation was associated with decreased earnings management. A majority of sample companies were required to form an audit committee according to Korean government law. The findings indicated that earnings management did not significantly decrease in the period after audit committee formation.

Wild (1994) also examined the link between audit committee formation and earnings quality, which was measured by the extent of market reaction to the release of earnings reports. For a sample of US companies over the period 1966 to 1980, this study found a significant increase in the market's reaction to earnings reports released after audit committee formation. However, for studies of this type, there may be other factors affecting market reaction, for which no control was provided.

Therefore, there are inconsistencies in the results of Jeon, Choi and Park (2004) and Wild (1994) on the association between audit committee formation and earnings quality. Furthermore, the results of Jeon, Choi and Park (2004) could have been affected by government regulation. Therefore, the use of Australian data in this research for the examination of audit committee formation, provides greater insights into the ability of audit committees to improve financial reporting quality in a relatively less regulated setting.

A range of audit committee characteristics have been tested in prior studies for their association with earnings management and other measures of earnings quality. The most commonly tested characteristics have been audit committee independence, expertise, activity and size. The remainder of this section synthesises the results from the prior studies regarding these characteristics.

Audit committee independence has been found to be significantly associated with measures of earnings management or earnings quality in several prior studies

(Klein 2002a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Van der Zahn and Tower 2004; Davidson, Goodwin-Stewart and Kent 2005; Vafeas 2005). However, within these studies, there are some inconsistencies in the results. For example, Klein (2002a) found no evidence of a significant association between an audit committee comprised solely of independent directors and her measure of earnings management. Whereas, Bedard, Chtourou and Courteau (2004) found that the same measure of audit committee independence was negatively associated with the likelihood of aggressive earnings management. Furthermore, Yang and Krishnan (2005) and Rahman and Ali (2006) did not find any significant association between audit committee independence and their earnings management measures. Overall, these results suggest that, while there is considerable evidence that the independence of an audit committee is positively associated with earnings quality, several inconsistencies exist in the literature.

Several prior studies have found a significant association between the expertise of the audit committee, earnings management and earnings quality (Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Dhaliwal, Naiker and Navissi 2006). A number of different measures of expertise were used in these studies. Xie, Davidson and DaDalt (2003a) found that earnings management was less likely to occur in companies whose audit committees had higher proportions of members with investment banking experience. Bedard, Chtourou and Courteau (2004) found that there was a negative association between the presence of a financial expert on the audit committee, as well as governance expertise, and the likelihood of aggressive earnings management. Choi, Jeon and Park (2004) found that the presence of professors or employees of financial institutions on the audit committee was negatively associated with earnings management. Dhaliwal, Naiker and Navissi (2006) found a significant positive relation between accounting expertise in audit committees and accruals quality. However, some inconsistencies exist between the results of these studies and others such as Van der Zahn and Tower (2004) who failed to find an association between the magnitude of earnings management and the audit committee's financial expertise amongst the independent directors.

Inconsistent results in the prior studies also exist for the association between audit committee activity and earnings management or earnings quality. While Xie, Davidson and DaDalt (2003a), Van der Zahn and Tower (2004) and Vafeas (2005)

each found evidence of a significant association between these variables, Choi, Jeon and Park (2004), Bedard, Chtourou and Courteau (2004) and Davidson, Goodwin-Stewart and Kent (2005) each found that audit committee activity was not significantly related to earnings management. Similar inconsistent results also exist in relation to the size of the audit committee. Both Choi, Jeon and Park (2004) and Yang and Krishnan (2005) found that larger audit committees were associated with lower earnings management. However, Bedard, Chtourou and Courteau (2004), Vafeas (2005) and Davidson, Goodwin-Stewart and Kent (2005) each did not find a significant result for audit committee size.

The empirical models used to measure earnings management and, inversely, earnings quality in most of the prior studies were based on the Jones (1991) model of discretionary or abnormal accruals. While this model has been widely used in earnings management research, it has subject to criticism in the literature (Dechow, Sloan and Sweeney 1995; Bernard and Skinner 1996; Guay, Kothari and Watts 1996; Hansen 1999; Larcker and Richardson 2004). Dhaliwal, Naiker and Navissi (2006) used a modified version of the Dechow and Dichev (2002) to measure accruals and earnings quality. This model is becoming more widely used in earnings quality research (Xie, Xie and Xu 2003b; Francis et al. 2004; Francis et al. 2005a; Francis, Nanda and Olsson 2005b; Francis, Olsson and Schipper 2005c). Vafeas (2005) used several alternative measures of earnings quality, which were the existence of small earnings increases and the avoidance of negative earnings surprises. This research used modified versions of both the Jones (1991) and Dechow and Dichev (2002) models to develop the earnings quality measures used in the empirical tests.

Overall, several conclusions can be drawn from the results of the prior research into the association between audit committees, earnings management and earnings quality, which are relevant to the research questions investigated in this research. First, there has only been limited prior research into the association between audit committee formation and earnings quality. Second, there is some evidence linking several audit committee characteristics and earnings quality. However, there have been mixed results in the literature with several papers failing to find a significant association between these variables.

## 2.6 Hypotheses

From a review of the literature, this section develops the hypotheses used to test the research questions.

### 2.6.1 Audit committee formation

Theoretical support for the formation of audit committees can be found in agency theory. According to agency theory, shareholders and debtholders act as principals who seek to obtain maximum utility from management acting as their agent (Kalbers and Fogarty 1998). Assuming economic self-interest, there is the potential for opportunistic actions by the agent, which are to the detriment of the principal. Due to the separation between ownership and management, the shareholders are unable to directly observe the actions of management (Jensen and Meckling 1976). Therefore, a system of corporate governance controls is established on the shareholders' behalf to discourage managers from pursuing objectives that do not maximise shareholder wealth. These controls are aimed at either aligning managers' and shareholders' incentives or limiting the opportunistic activities of managers (Dellaportas et al. 2005). Audit committees are one example of such a corporate governance control. These committees are an important part of the decision control system for the internal monitoring by boards of directors (Kalbers and Fogarty 1998). Bradbury (1990) argued that audit committees will be voluntarily employed to improve the quality of information flows between principal and agent where there are high agency costs.

Audit committees have been widely recommended in Australia and overseas as an important means of improving the quality of corporate financial reporting practices (e.g., Blue Ribbon Committee 1999; AARF, IIAA and AICD 2001; Ramsay 2001; ASX Corporate Governance Council 2003). The Blue Ribbon Committee (1999) highlighted that the audit committee's main job is oversight and monitoring of the financial reporting process. The *Audit Committees' Best Practice Guide* (AARF, IIAA and AICD 2001) recommended a number of responsibilities for audit committees in the area of external reporting. These responsibilities include: considering the appropriateness of the entity's accounting policies and principles; assessing significant estimates and judgements in the financial reports; assessing information from internal and external auditors that affects the quality of financial reports; and asking the external auditor for an independent judgement about the appropriateness of the accounting principles used (AARF, IIAA and AICD 2001).

Ramsay (2001) noted that both the Treadway Commission and the Kirk Panels in the United States recognised the role of audit committees as a means for maintaining financial market integrity through improving financial reporting quality. Furthermore, the ASX Corporate Governance Council (2003, p. 29) stated that:

Particularly for larger companies, an audit committee can be a more efficient mechanism than the full board for focusing the company on particular issues relevant to verifying and safeguarding the integrity of the company's financial reporting.

Several prior studies have provided empirical support for the association between audit committees and financial reporting quality. McMullen (1996) found that companies with more reliable financial reporting were more likely to have audit committees. The findings of Dechow, Sloan and Sweeney (1996) suggested that companies manipulating their earnings were less likely to have an audit committee. Beasley et al. (2000) found that fraud companies in certain industries had fewer audit committees than no-fraud companies.

Therefore, based on the above discussion, the following hypothesis is proposed:

*H1: The formation of an audit committee is positively associated with an increase in financial reporting quality.*

## **2.6.2 Audit committee independence**

The independence of an audit committee is often considered an essential characteristic influencing the committee's effectiveness in overseeing the financial reporting process. This is because of the effect of independence on the directors' ability to effectively monitor a company's financial reporting. It can be argued that independent directors are in the best position to serve as active overseers of the financial reporting process, thereby having a greater ability to withstand pressure from management to manipulate earnings (Klein 2002a). A director who has no personal or business ties with the company's management would be more likely to report management to the appropriate regulatory parties if they became aware of questionable financial reporting practices being undertaken by the company. Furthermore, independent directors on an audit committee can serve to assist the company's auditors to remain free of any undue influence and interference by management (Vicknair, Hickman and Carnes 1993).

The importance of audit committee independence is reflected in the majority of recommendations and laws for the mandatory establishment of audit committees,



which recommended or required that they should consist of at least a majority of non-executive directors (English 1994). The Blue Ribbon Committee (1999, p. 1079) argued that:

...a director without any financial, family, or other material personal ties to management is more likely to be able to evaluate objectively the propriety of management's accounting, internal control and reporting practices.

Following the recommendations of the Blue Ribbon Committee (1999), the audit committees of companies listed on the NYSE and NASD must be comprised solely of directors who are independent from the company and its management. The ASX Corporate Governance Council (2003) recommended that a majority of directors on an audit committee should be independent and that the committee's chairperson be independent.

Empirical support for the importance of audit committee members being independent of management can be found in a number of prior studies. Abbott, Park and Parker (2000) found that companies whose audit committees were comprised of independent directors were less likely to be sanctioned for fraudulent or misleading financial reporting. Furthermore, Klein (2002a), Bedard, Chtourou and Courteau (2004), Choi, Jeon and Park (2004), Van der Zahn and Tower (2004) and Davidson, Goodwin-Stewart and Kent (2005) all found support for a negative association between audit committee member independence and earnings management.

Therefore, the following hypotheses are put forward:

*H2a: The independence of an audit committee is positively associated with financial reporting quality;*

*H2b: An increase in the independence of an audit committee is positively associated with an increase in financial reporting quality.*

### **2.6.3 Audit committee expertise**

In addition to independence, the expertise of the audit committee is often considered an important characteristic for its effective operation. It has been argued that effective oversight by an audit committee requires that its members possess sufficient expertise in accounting and auditing to independently assess the matters that are presented to them (Beasley and Salterio 2001; Davidson, Xie and Xu 2004). Without a certain degree of expertise, it would be difficult for audit committee members to adequately understand the financial information they are required to assess. Furthermore, directors with professional legal qualifications are likely to have

greater knowledge of their fiduciary duties and the legal requirements regarding financial reporting.

Regulators in the United States and Australia have also placed considerable importance on the expertise of audit committee members. Following the Blue Ribbon Committee's (1999) recommendations, the NYSE and NASD exchanges in the United States amended their listing rules to require audit committee members to have a certain level of financial literacy and accounting or related financial management expertise. Similarly, the ASX Corporate Governance Council (2003) recommended that all audit committee members be financially literate and at least one member must have financial expertise.

The results of a number of prior studies lend support to the importance of the expertise of audit committee members. For example, the experiment by DeZoort (1998) found that members with experience in auditing made internal control judgements more like auditors than do members without such experience. Furthermore, the results of the experimental study by DeZoort and Salterio (2001) indicated that greater director experience and audit knowledge were associated with higher support by audit committee members for auditors in disputes with client management. Xie, Davidson and DaDalt (2003a), Bedard, Chtourou and Courteau (2004) and Choi, Jeon and Park (2004) found support for a negative association between the presence of at least one audit committee member with financial expertise and earnings management.

Therefore, the following hypotheses are proposed:

*H3a: The expertise of an audit committee is positively associated with financial reporting quality;*

*H3b: An increase in the expertise of an audit committee is positively associated with an increase in financial reporting quality.*

#### **2.6.4 Audit committee activity**

The level of activity of an audit committee has been recommended as important to enhance its effectiveness in improving financial reporting quality. It has been suggested that the mere formation of an audit committee does not mean that the committee is actually relied on by the board of directors to enhance its monitoring ability (Menon and Williams 1994). A more active audit committee, i.e., one that meets more frequently during the year, would provide its members with greater

opportunities for discussing and evaluating the issues that are placed before them concerning the company's financial reporting practices. Audit committees that meet only once during the year are unlikely to effectively accomplish their monitoring role (Menon and Williams 1994). Similarly, Choi, Jeon and Park (2004, p. 41) argued that an "...actively functioning audit committee is more likely to detect earnings management than a dormant committee."

Various committees have also highlighted the importance of having an active audit committee. The Treadway Commission in the United States (National Commission on Fraudulent Financial Reporting 1987) argued that an audit committee must maintain a constant level of activity to effectively carry out its oversight duties. It has also been noted in Australia that the conduct of audit committee meetings will greatly influence the ability of members to achieve the committee's objectives (AARF, IIAA and AICD 2001). Best practice guidelines have suggested that audit committees should meet at least three or four times per year (Cadbury Committee 1992; Price Waterhouse 1993; KPMG 1999).

There is also empirical support for the importance of the level of audit committee activity. Abbott, Park and Parker (2000) found that firms whose audit committees comprise only independent directors and that meet at least twice per year were less likely to be sanctioned for fraudulent or misleading financial reporting. The studies by Xie, Davidson and DaDalt (2003a) and Van der Zahn and Tower (2004) found a negative association between earnings management and the activity levels of audit committees.

From the preceding discussion, the following hypotheses are proposed:

*H4a: The activity of an audit committee is positively associated with financial reporting quality;*

*H4b: An increase in the activity of an audit committee is positively associated with an increase in financial reporting quality.*

## **2.6.5 Audit committee size**

The size of an audit committee can have a positive impact on financial reporting quality. Larger audit committees can be more effective as they are likely to include members with varied expertise to perform more intense monitoring of financial reporting practices (Choi, Jeon and Park 2004). Both the Blue Ribbon Committee (1999) and the ASX Corporate Governance Council (2003) recommended

that audit committees should have at least three members. It has been suggested that at least three members "...provides the necessary strength and diversity of expertise and views to ensure appropriate monitoring" (Bedard, Chtourou and Courteau 2004, p. 18). However, audit committee size is unlikely to be a linear relationship. In this regard, Karamanou and Vafeas (2005, p. 458) note "larger audit committees have a wider knowledge base on which to draw but are likely to suffer from process losses and diffusion of responsibility."

In accordance with the discussion above, the following hypotheses are proposed:

*H5a: The size of an audit committee is positively associated with financial reporting quality;*

*H5b: An increase in the size of an audit committee is positively associated with an increase in financial reporting quality.*

#### **2.6.6 Audit committee tenure**

The period of time for which an audit committee has been formed is expected to contribute to its effectiveness in carrying out its responsibilities. The longer an audit committee has been formed, the greater would be the experience of its members at performing their duties on the audit committee. This is expected to have a positive impact on financial reporting quality as the audit committee members would have more specific knowledge of the company's financial reporting practices. Similar arguments have been expressed in terms of external auditor tenure, where there is empirical evidence of higher audit quality with longer audit firm tenure (Carey and Simnett 2006).

Therefore, the following hypothesis is put forward:

*H6: The tenure of an audit committee is positively associated with financial reporting quality.*

### **2.7 Conclusion**

This Chapter reviews the literature relevant to this research and develops the hypotheses that were tested. First, there is a restatement of the two research questions introduced in Chapter 1. Second, prior research into various aspects of corporate governance is overviewed, with an emphasis on prior audit committee research. Third, the different perspectives of and methods of measuring financial reporting quality are

outlined. Fourth, the prior studies on the association between audit committees and financial reporting quality are discussed. Finally, the hypotheses tested in this research are developed. Chapter 3 explains the research method used to test these hypotheses.

## **3 Research Method**

### **3.1 Introduction**

The aim of this Chapter is to explain the method used to test the hypotheses developed in section 2.6 of Chapter 2. The Chapter is organised as follows: section 3.2 provides a justification for the chosen research method; section 3.3 explains the population from which the sample was chosen and the sample selection methods used; section 3.4 identifies the data sources used; section 3.5 explains how the dependent variable was measured; section 3.6 discusses the measurement of the independent variables including the control variables; section 3.7 details the empirical tests used to test the hypotheses; and section 3.8 concludes the Chapter by summarising its main themes.

### **3.2 Justification for the research method**

This research primarily used archival data in the form of company annual reports. Financial reporting quality was proxied through the use of three measures of earnings quality. These measures were based on the Jones (1991) model of discretionary accruals and the Dechow and Dichev (2002) accrual estimation error model. The three groups of empirical tests completed were: tests that examined the association between the formation of an audit committee and financial reporting quality; tests that analysed the association between audit committee characteristics and financial reporting quality; and tests on the association between changes in audit committee characteristics and financial reporting quality. The specific audit committee characteristics examined were independence, expertise, activity, size and tenure. Further detail on the method used is in the remaining sections of this Chapter.

There were a number of alternative approaches that could have been used to analyse the association between audit committees and financial reporting quality. This section provides a justification for the chosen method and a discussion of why the alternatives were not used.

First, surveys of a range of interested stakeholders could have been undertaken to gather their views on the association between audit committees and financial reporting quality. A number of prior studies such as Spangler and Braiotta (1990), Kalbers and Fogarty (1993) and Krishnamoorthy, Wright and Cohen (2002a) have

examined the broader issue of audit committee effectiveness through the use of survey data. Spangler and Braiotta (1990) surveyed audit engagement partners, audit committee chairpersons, audit committee members, chief financial officers and chief internal auditors to analyse the association between certain leadership characteristics and audit committee effectiveness. The study by Kalbers and Fogarty (1993) proposed that the effectiveness of audit committees was a function of the types and extent of audit committee power. Krishnamoorthy, Wright and Cohen (2002a) surveyed a sample of audit partners and managers to determine their views on the effectiveness of audit committees in ensuring the quality of the financial reporting process.

While survey studies can provide some very useful insights, they have a number of inherent limitations. First, there is often a low response rate from respondents due to difficulties with enlisting participation in such research. An implication of this is that if few responses are obtained from a given audit committee, the individual responses may not be generalisable to the audit committee itself (Spangler and Braiotta 1990). Furthermore, survey results may not be generalisable to subjects not included in the study's original sample.

A further limitation of survey studies is that they develop subjective measures of audit committee effectiveness because they are based on the perceptions of respondents. As noted by Spangler and Braiotta (1990, p. 152), "Individual perceptual data may be unreliable and invalid due to individual respondents' tendency to be strict, lenient, or to avoid extreme responses." The biases and subjectivity of individuals can result in measures of audit committee effectiveness that do not accurately reflect the committee's true performance. Members of the audit committees may tend to overstate their own effectiveness so as to portray themselves in the best light, while senior management may understate the committee's effectiveness if it has been critical of senior management (Spangler and Braiotta 1990).

Due to the inherent limitations of survey research, it was decided not to use this method to collect the necessary data for this research. The use of archival data in the form of company annual reports overcomes these limitations in several ways. First, the use of annual reports does not suffer from non-response bias, as the researcher can readily access the required data from a variety of databases. Second, relatively objective measures of financial reporting quality can be calculated from the data in annual reports

A second method of examining the association between audit committees and financial reporting quality would be to examine instances of financial statement fraud. These instances would be considered extreme cases of poor quality financial reporting. Several prior studies have examined the association between audit committees and/or boards of directors and financial statement fraud. These include: Beasley (1996); Dechow, Sloan and Sweeney (1996); McMullen (1996); Abbott, Park and Parker (2000); Beasley et al. (2000); Sharma (2004); and Song and Windram (2004). These papers are discussed further in section 2.5.1 of Chapter 2.

There are a number of reasons why cases of financial statement fraud were not used to examine the association between audit committees and financial reporting quality. First, as noted above, cases of financial statement fraud reflect extreme instances of poor quality financial reporting. Consequently, these cases would only capture a small proportion of all cases of poor quality financial reporting. The approach taken in this research was to develop three proxy measures of earnings quality that resulted in a larger sample than if financial statement fraud was used. The explanation of and justification for the specific proxy measures used is in section 3.5 of this Chapter. Second, this research used data on Australian listed companies. Therefore, given the size of the corporate market in Australia and the number of cases of financial statement fraud, it would have been difficult to obtain a sufficiently large sample. In this regard, using Australian data for the period 1988-2000, Sharma (2004) identified 78 companies experiencing fraud, which was reduced to a final fraud sample of 31 companies.

A third method of examining the association between audit committees and financial reporting quality would be to examine various external third party ratings of the quality of financial reporting. One study that used this approach was Felo, Krishnamurthy and Solieri (2003). This study analysed financial reporting quality as measured by financial analysts and reported by the Association for Investment Management and Research (AIMR) Review of Corporate Reporting Practices in the United States (Felo, Krishnamurthy and Solieri 2003).

An approach similar to Felo, Krishnamurthy and Solieri (2003) was not used in this research for several reasons. First, using external evaluations of financial reporting quality would result in subjective measures because they are based on the views of the people who undertook the analysis. Furthermore, for Australian companies, the only known external evaluation of financial reporting quality is by the



Australasian Reporting Awards. Amongst other things, these Awards are designed to "...promote excellence in reporting through the publication of informative and factual reports" (Australasian Reporting Awards 2006). However, to be eligible for these awards, companies must nominate themselves, which means there is likely to be bias towards companies that have higher quality financial reporting. Hence, it was decided not to use the results of such awards to determine the financial reporting quality of the sample companies.

### **3.3 Population and sample selection**

#### **3.3.1 Population**

The population from which the sample was drawn was the top 500 Australian companies listed on the Australian Stock Exchange (ASX) with financial years ending during 2001. This year was selected as the base year for the collection of the necessary data because, when the data collection for this research commenced, 2001 was the most recent year for which full financial statement data was available for the sample companies. Data for financial years that ended during 2002 was also required to calculate the two earnings quality measures based on the Dechow and Dichev (2002) model.

Furthermore, the selection of 2001 as the base year is supported by recent changes to the ASX listing rules. Following the recommendations of the ASX Corporate Governance Council (2003), ASX Listing Rule 12.7 was introduced on 1 January 2003 requiring all entities in the S & P All Ordinaries Index at the beginning of their financial years to have an audit committee during the year. A further requirement of this listing rule is that all entities in the top 300 of the Index are required to comply with the ASX Corporate Governance Council's best practice recommendations relating to the composition, operation and responsibility of the audit committee (Australian Stock Exchange 2006b). Consequently, 2001 was selected as the base year to avoid the effect of this listing rule on the sample companies' audit committees. If 2003 had been used as the base year, there is likely to have been less variation in the audit committee characteristics because of companies complying with the listing rule's requirements. The year 2002 was not used to avoid the effects of companies making changes to their audit committees in anticipation of the new listing rule.

Therefore, the decision to use 2001 as the base year affected the availability of annual report data. The *Annual Reports Collection* database (Connect 4 Pty Ltd 2006) was used to collect the data to construct the audit committee variables and some of the control variables. The measurement of these variables is explained in section 3.6 of this Chapter. For 2001, this database only contains the annual reports of the top 500 companies listed on the ASX. From 2003 onwards, the database contains the annual reports of all entities listed on the ASX (Connect 4 Pty Ltd 2006).

Several types of companies were excluded from the population prior to the selection of the sample. Consistent with Clifford and Evans (1997), trusts and foreign companies domiciled outside Australia were excluded because their financial statements are not always prepared in accordance with the normal disclosure requirements for other companies listed on the ASX. Similarly, banks were excluded because their financial statements are prepared in accordance with the *Banking Act 1959* (Cwlth), which results in some of their financial statements being of a different format and different financial information being disclosed. These exclusions reduced the population to 463 companies out of the top 500 companies ASX listed companies in 2001.

### **3.3.2 Sample selection**

Prior to selecting the sample companies from the population of 463 listed Australian companies, an analysis was performed of those companies that did and did not have an audit committee during the year 2001. This was necessary because one of the empirical tests analysed the difference in financial reporting quality in the years before and after audit committee formation. It was necessary to first identify which companies had an audit committee before determining the year of formation. To identify which companies had an audit committee, reliance was placed on the results of the *Horwath 2002 Corporate Governance Report* (Psaros and Seamer 2002). This Report provided information on the corporate governance disclosures of Australia's top 250 companies in their 2001 annual reports. The authors of the Report assessed the annual report disclosures and then used this assessment to rank the companies on the quality of their corporate governance structures. Only nine companies (3.6%) were given a five star rating, which meant that their structures met all best practice standards, whereas thirteen companies (5.2%) were given a one star rating indicating that their corporate governance structures were lacking in several areas (Psaros and

Seamer 2002). From the results of the Report, for many of the top 250 companies, it was possible to identify which of them had an audit committee. This was done by referring to the company listings in the Report, which contained the number of stars allocated to each company based on their corporate governance disclosures. From the star rating explanations in the Report, it was concluded that companies with 4, 4.5 or 5 stars had an audit committee in 2001.

For the bottom 250 of the top 500 ASX listed companies, their annual reports on the *Annual Reports Collection* (Connect 4 Pty Ltd 2006) were analysed to identify the existence or otherwise of an audit committee. This was also done for those top 250 companies where the existence or otherwise of an audit committee could not be determined from the *Horwath 2002 Corporate Governance Report* (Psaros and Seamer 2002). Since 1 July 1993, under ASX listing rules, Australian listed companies have been required to disclose in their annual reports whether they have an audit committee (Moroney and Simnett 1996). Furthermore, since 1 July 1996, ASX listing rule 4.10.3 has required all listed entities to include in their annual report a statement disclosing their main corporate governance practices (Australian Stock Exchange 2006b). Therefore, to determine the existence or otherwise of an audit committee, the corporate governance statements in the company's annual reports were analysed. Overall, it was determined that 422 of the 463 companies in the reduced population had an audit committee in 2001. A total of 37 companies disclosed that they did not have an audit committee. However, for four companies, it was not possible to determine whether an audit committee existed. For those companies without an audit committee, the reasons disclosed for not having such a committee are summarised in section 4.2 of Chapter 4.

From the population of 422 companies with an audit committee in 2001, 15 companies in the Diversified Financials and Real Estate industry groups were excluded because companies in both groups do not typically generate any sales revenue. From the remaining 407 companies, a random sample of 230 companies was initially selected to form the basis for the empirical tests undertaken. The use of a reduced sample rendered the collection and collation of the audit committee data for the statistical tests more efficient and manageable. On average, it took 3 to 4 hours per company to hand collect the necessary audit committee data from the company annual reports. The sample was selected using a random number generator to derive 230 random numbers. The random number generator used was *random.org*, which was

developed by Mads Haahr who works at the University of Dublin, Trinity College in Ireland (Haahr 2006). The sample companies were then selected from the listing of 407 companies with an audit committee in 2001. This selection was done by matching the random number with the number corresponding to each company in the list.

Several of the selected company industry groups were too small to form sufficiently large industry matched samples to calculate the earnings quality variables for the sample companies. Therefore, another 22 companies from the following four digit Global Industry Classification Standard (GICS) industry groups were excluded: Automobiles and Components; Consumer Durables and Apparel; Food and Staples Retailing; Household and Personal Products; Banks; Insurance; Semiconductors and Semiconductor Equipment; and Utilities. This left a final sample of 208 companies for tests of the association between audit committee characteristics and earnings quality. The use of GICS is further discussed in section 3.5.1.2.

The following table summarises the sample size used as the basis for the empirical tests described in section 3.7:

**Table 3.1 Summary of sample size used for empirical tests**

		<b>Number of companies</b>
Top 500 ASX listed companies in 2001		500
Less,		
• Banks, trusts and foreign companies	37	
• Companies without audit committees	37	
• Audit committee existence could not be determined	<u>4</u>	<u>78</u>
Companies with audit committees		422
Less, Diversified financials and real estate		<u>15</u>
		<u>407</u>
Random sample		230
Less, Companies from small industry groups		<u>22</u>
Sample for audit committee characteristic tests		<u>208</u>

To assess the representativeness of the reduced sample of 208 companies, it was compared to the other 214 companies in the full sample of 422 companies across the dimensions of size, leverage, asset growth and return on assets (ROA).

Independent samples t-tests indicated that the two samples were not significantly

different in terms of these variables. Furthermore, table 3.2 below shows that there were similar proportions of companies in each industry group across the reduced and full samples.

**Table 3.2 Breakdown of companies in industry groups for full and reduced samples**

Industry group	Full sample (422)		Reduced sample (208)	
	Number	Percentage	Number	Percentage
Capital goods	35	8.3	23	11.1
Commercial services and supplies	22	5.2	12	5.8
Energy	20	4.7	15	7.2
Food, beverage and tobacco	30	7.1	23	11.1
Healthcare equipment and services	19	4.5	11	5.3
Hotels, restaurants and leisure	17	4.0	10	4.8
Materials	83	19.7	49	23.6
Media	20	4.7	17	8.2
Pharmaceuticals and biotechnology	16	3.8	7	3.4
Retailing	22	5.2	15	7.2
Software and services	25	5.9	14	6.7
Technology hardware and equipment	10	2.4	6	2.9
Telecommunication services	14	3.3	6	2.9
Transportation <sup>1</sup>	9	2.1	0	0
Diversified financials <sup>2</sup>	35	8.3	0	0
Utilities <sup>1</sup>	6	1.4	0	0
Real estate <sup>2</sup>	17	4.0	0	0
Insurance <sup>1</sup>	7	1.7	0	0
Consumer durables and apparel <sup>1</sup>	3	0.7	0	0
Automobiles and components <sup>1</sup>	6	1.4	0	0
Food and staples retailing <sup>1</sup>	4	0.9	0	0
Household and personal products <sup>1</sup>	1	0.2	0	0
Semiconductors <sup>1</sup>	1	0.2	0	0
Total	422	100.0		

<sup>1</sup> Industry group not included in reduced sample due to small number of companies in the industry.

<sup>2</sup> Industry group not included in reduced sample due to lack of sales revenue.

### 3.4 Data sources

Annual report data were used to measure the variables required to test the hypotheses developed in section 2.6 of Chapter 2. The data were obtained from a number of sources. As section 3.3.2 above discusses, the *Annual Reports Collection* (Connect 4 Pty Ltd 2006) was used to determine whether the 463 top 500 ASX listed companies in 2001 had an audit committee, as well as the year of audit committee formation for some of the 208 sample companies. The *Annual Reports Collection* was also used to gather the data for the audit committee and control variables discussed in section 3.6.

The *Aspect Financial Database* (SIRCA Ltd 2004) was used to gather the various financial statement data items used to calculate the earnings quality variables explained in section 3.5. This database "...provides comprehensive coverage of financial data on every company listed on the ASX and the New Zealand Stock Exchange" (Aspect Financial Pty Ltd 2003, p. 3). To verify the accuracy of the data obtained from this database, the *Aspect* data were cross-checked with the financial statement data for 50 sample companies in the *Annual Reports Collection* (Connect 4 Pty Ltd 2006). The *Aspect* database appeared to accurately reflect the financial statement data on the *Annual Reports Collection*.

The *DataAnalysis* online database was used to gather data that was not available on either of the other two databases. *DataAnalysis* contains the annual reports of all ASX listed companies from 1995 onwards and annual reports back to the early 1990's for some larger companies (Aspect Huntley 2006). This database was used to gather the audit committee, board of directors and audit data for companies whose annual reports were not available on the *Annual Reports Collection* (Connect 4 Pty Ltd 2006). Furthermore, *DataAnalysis* was used to obtain any financial statement data items that were missing from the *Aspect Financial Database* (SIRCA Ltd 2004). The *Annual Reports Collection* (Connect 4 Pty Ltd 2006) was used instead of the *DataAnalysis* database to choose the sample and to gather the audit committee and control variable data because its search facilities enabled the necessary data to be located and collected more efficiently.

Information on the Global Industry Classification Standard (GICS) was obtained from Standard & Poor's, which jointly developed the GICS with Morgan Stanley Capital International Inc. Since 1 July 2002, the GICS has been used to

classify companies listed on the ASX (Australian Stock Exchange 2006d). This information was used to form the industry matched samples required to calculate the dependent variables as discussed in section 3.5.1.2.

### **3.5 Measurement of dependent variables**

The construct investigated in this research was financial reporting quality. This construct was measured through the development of three proxy measures for earnings quality. Earnings quality is one way of capturing the construct of financial reporting quality. Alternatively, it could have been captured using third party assessments of the quality of the financial disclosures in annual reports or through surveys of stakeholders on their perceptions of financial reporting quality. However, as section 3.2 notes, these types of approaches inherently develop subjective measures of financial reporting quality and can be subject to a bias towards higher quality financial reporting.

Schipper and Vincent (2003) discussed a number of empirical measures used by prior research studies to measure earnings quality. They categorised earnings quality measures as those derived from: "(1) the time-series properties of earnings; (2) selected qualitative characteristics in the FASB's Conceptual Framework; (3) the relations among income, cash and accruals; and (4) implementation decisions" (Schipper and Vincent 2003, p. 99). The three earnings quality proxies used in this research were based on cross-sectional versions of the models developed by Jones (1991) and Dechow and Dichev (2002). The use of cross-sectional models is justified in section 3.5.1.2. These proxies are part of the third category of earnings quality constructs discussed by Schipper and Vincent (2003) and were chosen because they have been more widely used in similar prior research than the other measures.

#### **3.5.1 Jones (1991) model**

The first earnings quality proxy used was based on the model developed in Jones (1991). This model focuses on calculating the discretionary portion of total accruals, which is then used as a measure of earnings management. To partition total accruals into its discretionary and non-discretionary components, Jones (1991) used the following expectations model for total accruals to control for changes in the firm's economic circumstances:

$$TA_{i,t}/A_{i,t-1} = \alpha_i[1/A_{i,t-1}] + \beta_{1i}[\Delta REV_{it}/A_{i,t-1}] + \beta_{2i}[PPE_{it}/A_{i,t-1}] + \varepsilon_{i,t} \quad (1)$$

Where:  $TA_{i,t}$  = Total accruals in year  $t$  for firm  $i$ ;

$A_{i,t-1}$  = Total assets in year  $t - 1$  for firm  $i$ ;

$\Delta REV_{it}$  = Revenues in year  $t$  less revenues in year  $t - 1$  for firm  $i$ ;

$PPE_{it}$  = Gross property, plant and equipment in year  $t$  for firm  $i$ ;

$\varepsilon_{i,t}$  = Error term in year  $t$  for firm  $i$ .

The change in revenues and gross property, plant and equipment were included in the above model to control for changes in non-discretionary accruals due to changing conditions. The change in revenues was included as it was assumed to be an objective measure of the firms' operations before any manipulation by management, whereas gross property, plant and equipment was included to control for the non-discretionary depreciation expense (Jones 1991).

Jones (1991) used ordinary least squares regression for equation (1) to generate firm specific coefficients for  $\alpha_i$ ,  $\beta_{1i}$  and  $\beta_{2i}$ . These coefficients were then used to estimate the level of non-discretionary accruals for each sample firm using the following model:

$$NDA_{it} = a_i[1/A_{i,t-1}] + b_{1i}[\Delta REV_{it}/A_{i,t-1}] + b_{2i}[PPE_{it}/A_{i,t-1}] \quad (2)$$

Where:  $NDA_{it}$  = Non-discretionary accruals in year  $t$  for firm  $i$ ;

$A_{i,t-1}$  = Total assets in year  $t - 1$  for firm  $i$ ;

$\Delta REV_{it}$  = Revenues in year  $t$  less revenues in year  $t - 1$  for firm  $i$ ;

$PPE_{it}$  = Gross property, plant and equipment in year  $t$  for firm  $i$ .

The level of discretionary accruals was then estimated by Jones (1991) using the following model. It was used as a proxy for the extent of earnings management:

$$DA_{it} = TA_{i,t}/A_{i,t-1} - NDA_{it} \quad (3)$$

Where:  $DA_{it}$  = Discretionary accruals in year  $t$  for firm  $i$

$TA_{i,t}$  = Total accruals in year  $t$  for firm  $i$ ;

$A_{i,t-1}$  = Total assets in year  $t - 1$  for firm  $i$ ;

$NDA_{it}$  = Non-discretionary accruals in year  $t$  for firm  $i$  from equation

(2).

### 3.5.1.1 Modified Jones model

This research used a modification of the original Jones (1991) model as proposed by Francis et al. (2005a). They included the change in accounts receivable



in the estimation model for normal or non-discretionary accruals (i.e., equation (1) above). This was done based on the reasoning that, not doing so, would produce values for abnormal (discretionary) accruals that are not centred on zero when the mean  $\Delta REC$  is not zero (Francis et al. 2005a). In this research, the estimation model was run on cross-sectional samples of companies in the same industry groups as the sample companies. Justification for the use of cross-sectional samples is in section 3.5.1.2. Therefore, for this research, equation (1) above became:

$$TA_{i,t}/A_{i,t-1} = \alpha_i[1/A_{i,t-1}] + \beta_{1i}[\Delta REV_{it} - \Delta REC_{it}/A_{i,t-1}] + \beta_{2i}[PPE_{it}/A_{i,t-1}] + \varepsilon_{i,t} \quad (4)$$

Where:  $TA_{i,t}$  = Total accruals in year  $t$  for firm  $i$  (measured by operating profit

after tax – cash flow from operations);

$A_{i,t-1}$  = Total assets in year  $t - 1$  for firm  $i$ ;

$\Delta REV_{it}$  = Revenues in year  $t$  less revenues in year  $t - 1$  for firm  $i$ ;

$\Delta REC_{it}$  = Net receivables in year  $t$  less net receivables in year  $t - 1$  for firm  $i$ ;

$PPE_{it}$  = Gross property, plant and equipment in year  $t$  for firm  $i$ ;

$\varepsilon_{i,t}$  = Error term in year  $t$  for firm  $i$ .

A further modification of the Jones (1991) model was proposed by Dechow, Sloan and Sweeney (1995). This version of the Jones (1991) model adjusted the change in revenues for the change in receivables in the estimation of the level of non-discretionary accruals for each of the sample companies. In this research, the following estimation model was run to estimate the level of non-discretionary accruals for each sample company using the industry specific coefficients for  $\alpha_i$ ,  $\beta_{1i}$  and  $\beta_{2i}$  from equation (4). Therefore, for this research, equation (2) above became:

$$NDA_{it} = a_i[1/A_{i,t-1}] + b_{1i}[\Delta REV_{it} - \Delta REC_{it}/A_{i,t-1}] + b_{2i}[PPE_{it}/A_{i,t-1}] \quad (5)$$

Where:  $NDA_{it}$  = Non-discretionary accruals in year  $t$  for firm  $i$ ;

$A_{i,t-1}$  = Total assets in year  $t - 1$  for firm  $i$ ;

$\Delta REV_{it}$  = Revenues in year  $t$  less revenues in year  $t - 1$  for firm  $i$ ;

$\Delta REC_{it}$  = Net receivables in year  $t$  less net receivables in year  $t - 1$  for firm  $i$ ;

$PPE_{it}$  = Gross property, plant and equipment in year  $t$  for firm  $i$ .

The change in receivables was included because of the assumption in the original Jones (1991) model that revenues were entirely non-discretionary. The modified Jones (1991) model in equation (4) "...implicitly assumes that all changes in

credit sales in the event period result from earnings management” (Dechow, Sloan and Sweeney 1995, p. 199). Dechow, Sloan and Sweeney (1995) justified the inclusion of the change in receivables by arguing that earnings management was more likely to occur in relation to credit sales rather than cash sales.

Using the modifications to the original Jones (1991) model proposed by Francis et al. (2005a) and Dechow, Sloan and Sweeney (1995), the level of discretionary accruals was then calculated using the approach in equation 3 above, i.e., nondiscretionary accruals was subtracted from total accruals to give a measure of discretionary accruals. Discretionary accruals were used to capture the extent of earnings management by the sample companies. Earnings management can be viewed as an inverse measure of earnings quality: the higher the extent of earnings management, the lower the quality of earnings and vice versa (Schipper and Vincent 2003). Therefore, the absolute values of the discretionary accruals were used in this research as the first proxy for earnings quality. The name of this variable was EQJones.

### **3.5.1.2 Cross sectional versus time series**

The original Jones (1991) model used a time series approach with at least 14 years of data for each sample firm. The use of time series data imposes both a survivorship bias and a selection bias because at least 10 years of data are required to obtain the parameter estimates (Jeter and Shivakumar 1999; Menon and Williams 2004). This is because firms surviving for 10 or more years "...are more likely to be large, mature firms with greater reputational capital to lose if earnings management is uncovered" (Jeter and Shivakumar 1999, p. 301).

Therefore, many of the prior research studies using the original Jones (1991) model or variations of it to estimate earnings management proxies, used cross sectional data instead of time series data. The use of cross sectional data involves gathering data on companies in the same industry as the sample companies. This implicitly assumes that the model coefficients are the same across all companies in the same industry during the estimation period (Jeter and Shivakumar 1999; Menon and Williams 2004). Examples of studies that have used cross sectional data include those that have examined: the underperformance of seasoned equity offerings (Teoh, Welch and Wong 1998a); the stock market pricing of discretionary accruals (Subramanyam 1996); institutional ownership and monitoring (Chung, Firth and Kim

2002; Koh 2003); auditor industry expertise (Balsam, Krishnan and Yang 2003; Krishnan 2003); voluntary disclosure (Kasznik 1999); managers' incentives and audit fees (Gul, Chen and Tsui 2003); audit quality (Becker et al. 1998; Francis, Maydew and Sparks 1999; Chen, Lin and Zhou 2005); non-audit service fees (Frankel, Johnson and Nelson 2002; Chung and Kallapur 2003); debt covenant violations (DeFond and Jiambalvo 1994); former audit firm personnel as CFOs (Dowdell and Krishnan 2004); and audit qualifications (Bartov, Gul and Tsui 2001).

This research used data on the Global Industry Classification Standard (GICS) to form the industry matched samples necessary for a cross sectional version of the Jones (1991) model. As discussed in section 3.4, the GICS has been used to classify companies listed on the ASX since 1 July 2002. The GICS currently comprises 10 Sectors comprising 24 industry groups, 67 industries, and 147 sub-industries (Australian Stock Exchange 2006d).

Four digit GICS industry groups as at 30 April 2003 were used to form the industry matched samples. This was the earliest date for which the GICS classification structure was available from Standard & Poor's when the data collection for this research commenced. Table 3.3 below shows the number of companies in each of the 24 GICS industry groups at that date.

**Table 3.3 Number of ASX listed companies in four digit GICS industry groups as at 30 April 2003**

<b>Industry group</b>	<b>Number of companies</b>
Energy	68
Materials	417
Capital Goods	81
Commercial Services and Supplies	84
Transportation	23
Automobiles and Components	13
Consumer Durables and Apparel	17
Hotels Restaurants and Leisure	45
Media	52
Retailing	36
Food and Staples Retailing	11
Food Beverage and Tobacco	57
Household and Personal Products	2
Health Care Equipment and Services	61
Pharmaceuticals and Biotechnology	61
Banks	15
Diversified Financials	121
Insurance	10
Real Estate	95
Software and Services	110
Technology Hardware and Equipment	43
Semiconductors and Semiconductor Equipment	1
Telecommunication Services	40
Utilities	17

The use of the modified Jones (1991) model in a cross sectional setting required at least 8-10 companies in the same industry group as each of the sample companies. Therefore, it was decided to only select companies in those industry groups in Table 3.3 that had 20 or more companies. This allowed for the possibility that some companies existing as at 30 April 2003 may not have existed in the year for

which the financial statement data was sought. Consequently, the following industry groups were excluded for this reason: Automobiles and Components; Consumer Durables and Apparel; Food and Staples Retailing; Household and Personal Products; Banks; Insurance; Semiconductors and Semiconductor Equipment; and Utilities. Furthermore, companies from the Diversified Financials industry group were also excluded because many of them were investment companies that did not generate any sales revenue. Finally, companies in the Real Estate industry group were excluded because many of them were property trusts and, therefore, did not generate any sales revenue.

Therefore, the specific GICS industry groups used were: Energy; Materials; Capital Goods; Commercial Services and Supplies; Transportation; Hotels, Restaurants and Leisure; Media; Retailing; Food, Beverage and Tobacco; Health Care Equipment and Services; Pharmaceuticals and Biotechnology; Software and Services; Technology, Hardware and Equipment; and Telecommunication Services. For each of the sample companies, an initial sample of 30 companies from the same industry group was selected. The financial statement data for the industry groups was collected from the data sources identified in section 3.4 for each of the years for which the data was sought.

### **3.5.2 Dechow and Dichev (2002) model**

The Jones (1991) model and its variations have been widely used to develop proxies for earnings management and, inversely, earnings quality. However, discretionary accruals models have been the subject of criticism in a number of studies. It has been argued that there is the potential for the misclassification of expected accruals as unexpected because of the incompleteness of the expected accruals model (Bernard and Skinner 1996; Larcker and Richardson 2004). Guay, Kothari and Watts (1996) suggested that their evidence was consistent with the models estimating discretionary accruals with considerable imprecision and/or misspecification. Hansen (1999) concluded that studies relying entirely on the validity of discretionary accruals models were likely to under- or overstate proposed earnings management behaviour. Dechow, Sloan and Sweeney (1995) demonstrated that discretionary accruals models typically generated tests of low power for earnings management of economically plausible magnitudes.

Therefore, to attempt to overcome criticisms of the modified Jones model, an alternative model was also used to develop proxies for earnings quality. This alternative model was based on the accrual estimation error model developed in Dechow and Dichev (2002), which ran the following firm-level time-series regression for each sample company. All variables in equation (6) were divided by average total assets:

$$\Delta WC_t = b_0 + b_1 CFO_{t-1} + b_2 CFO_t + b_3 CFO_{t+1} + \varepsilon_t \quad (6)$$

Where:  $\Delta WC_t$  =  $\Delta$  Working capital in year  $t$  i.e.  $\Delta$ Accounts receivable +

$\Delta$ Inventory -  $\Delta$ Accounts payable -  $\Delta$ Taxes payable +  $\Delta$ Other assets (net);

$CFO_{t-1}$  = Cash flows from operations in year  $t - 1$ ;

$CFO_t$  = Cash flows from operations in year  $t$ ;

$CFO_{t+1}$  = Cash flows from operations year in year  $t + 1$ ;

This model rests on the argument that estimation errors in accruals and their subsequent corrections represent noise that reduces the beneficial role of accruals. Consequently, accruals quality and earnings quality decrease with the magnitude of the accrual estimation errors (Dechow and Dichev 2002). Estimation errors can occur, e.g., when the cash receipt from a debtor is less than the original credit sale that was recorded. This may result from the bankruptcy of the debtor resulting in an inability to pay the full amount owing, or due to opportunistic earnings management being undertaken by company management. Both of these events have an adverse effect on earnings quality.

The residuals from equation (6) capture the extent to which accruals map into cash flow realisations in past, present and future cash flows. Dechow and Dichev (2002) used the standard deviation of the residuals from their time series model as a firm-level measure of accruals and earnings quality. A higher standard deviation of the residuals, denotes a poorer match between accruals and cash flows and, therefore, lower quality accruals and earnings (Dechow and Dichev 2002).

However, the standard deviation of residuals used by Dechow and Dichev (2002) could not be used in this research as a measure of earnings quality because it provides a measure of earnings quality across a number of years. The empirical tests discussed in section 3.7 required measures of earnings quality for specific firm years. The absolute values of the residuals were, therefore, used in this research as the

second earnings quality proxy. The higher the residual for each sample company, the lower the quality of accruals and earnings and vice versa. This variable was named EQDD. Dechow and Dichev (2002) also used the absolute value of the residuals as an alternative measure of accruals quality and found that the tenor of their results was similar for this alternative specification.

Furthermore, Dechow and Dichev (2002) used a time series design, which requires approximately 10 years of data for each sample company to estimate the regression coefficients. It can be difficult to obtain such data for a sufficiently large sample of Australian companies. Therefore, this research used a cross-sectional design instead, whereby equation (6) was run using industry group matched samples, instead of time-series samples for each sample company. The industry matched samples were formed using the procedure discussed in section 3.5.1.2. If the standard deviations of the residuals had been used with the cross-sectional data, this would have given measures of earnings quality across each industry group and not for the specific sample companies.

In her discussion of the Dechow and Dichev (2002) paper, McNichols (2002) suggested including two variables from the original Jones (1991) model, i.e., the change in current sales and the level of property plant and equipment. McNichols (2002) believed that linking the two approaches taken by Dechow and Dichev (2002) and Jones (1991) had the potential to strengthen both approaches and calibrate the errors from both models. McNichols (2002) found that the model with the most explanatory power was the one that added the two variables from the original Jones (1991) model to the Dechow and Dichev (2002) model. Therefore, this research used the following regression to calculate a third proxy for earnings quality. This variable was named EQDDadj. As with equation (6), cross sectional industry matched samples were used and the absolute values of the residual for each sample company were used as the measure of earnings quality:

$$\Delta WC_t = b_0 + b_1 CFO_{t-1} + b_2 CFO_t + b_3 CFO_{t+1} + b_4 \Delta Sales_t + b_5 PPE_t + \varepsilon_t \quad (7)$$

Where:  $\Delta WC_t$  =  $\Delta$  Working capital in year  $t$  i.e.  $\Delta$ Accounts receivable +

$\Delta$ Inventory -  $\Delta$ Accounts payable -  $\Delta$ Taxes payable +  $\Delta$ Other assets

(net). For ease of calculations, this was calculated as ( $\Delta$ Current Assets

-  $\Delta$ Current Liabilities) -  $\Delta$ Cash.;

$CFO_{t-1}$  = Cash flows from operations in year  $t - 1$ ;

$CFO_t$  = Cash flows from operations in year  $t$ ;

$CFO_{t+1}$  = Cash flows from operations year in year  $t + 1$ ;

$\Delta Sales_t$  = Sales in year  $t$  – Sales in year  $t - 1$ ;

$PPE_t$  = Gross property, plant and equipment in year  $t$ .

### **3.6 Measurement of independent variables**

This section explains the measures used for the independent variables, as well as several control variables. A summary of the measures for the variables is presented in the table below.



**Table 3.4 Measurement of independent and control variables**

	<b>Variable Name</b>	<b>Variable measurement</b>
<b>Independent variables</b>	ACIND	The proportion of independent directors on the audit committee.
	ACACCEXP	The proportion of audit committee members with professional accounting qualifications.
	ACLEGEXP	The proportion of audit committee members with professional legal qualifications.
	ACMEET	The number of audit committee meetings for the year.
	ACSIZE	The number of directors on the audit committee.
	ACTENURE	The number of years between the year in which the audit committee was formed and 2001.
<b>Control variables</b>	BDSIZE	The number of directors on the board.
	BDIND	The proportion of independent directors on the board.
	BDACCEXP	The proportion of board members with professional accounting qualifications.
	BDLEGEXP	The proportion of board members with professional legal qualifications.
	BDMEET	The number of board meetings for the year.
	AUDITOR	1 = a company's auditor was a Big 5 or 6 firm and 0 = otherwise.
	LNSIZE	The natural log of total assets.
	LEV	The ratio of total liabilities to total assets.
	INDUSTRY	1 = a company was from a particular industry group and 0 = otherwise.
	YEAR	1 = the year after audit committee formation and 0 = otherwise.

### 3.6.1 Audit committee formation

Hypothesis 1 proposes that the formation of an audit committee is positively associated with an increase in financial reporting quality. The year of formation of the sample companies' audit committees was identified in several ways. First, a small number of companies disclosed in their 2001 annual reports the year that they formed their audit committee. Second, limited data on the year of audit committee formation was available from the results of the survey by Baxter (2001). This study surveyed a sample of ASX listed companies to determine their level of compliance with best practice guidelines for audit committees. Part of the data collected from this survey was the year that the companies established their audit committees.

Third, some data on companies that formed their audit committee prior to 1 July 1993 was obtained from one of the authors of the Monroe, Teh and Robinson (1995) study. As the original ASX listing rule requiring listed entities to disclose the existence of an audit committee became effective on this date, it was not possible to use annual reports to reliably determine the year of audit committee formation prior to this date. Therefore, companies forming an audit committee prior to 1 July 1993 were excluded from the tests that compared financial reporting quality in the years before and after the formation of an audit committee. Furthermore, companies that listed on the ASX with an audit committee were excluded from these tests because the year of audit committee formation could not be reliably determined. After the exclusion of a further 11 companies due to the unavailability of data, this reduced the final sample for these tests to 58 companies.

Finally, the annual reports of those sample companies not covered by Baxter (2001) and Monroe, Teh and Robinson (1995) were analysed on the *Annual Reports Collection* (Connect 4 Pty Ltd 2006) to determine the years of audit committee formation. If a company disclosed that it had an audit committee in one year but disclosed that it did not have an audit committee in the immediately previous year, it was assumed that the committee was formed during the later year. For example, if a company disclosed that it had an audit committee in 1998, but disclosed that it did not have an audit committee in 1997, it was assumed that the committee was formed sometime during the 1998 financial year. Where annual reports for every year were not available on the *Annual Reports Collection*, annual reports on the *DataAnalysis* online database (Aspect Huntley 2006) were examined instead.

### 3.6.2 Audit committee independence

Hypotheses 2a and 2b refer to the association between the independence of the audit committee and financial reporting quality. The first step in developing a measure of audit committee independence was to individually assess the independence of the directors who were members of their company's audit committee. In doing so, the definition of director independence as specified by the ASX Corporate Governance Council (2003) was used. According to this definition (ASX Corporate Governance Council 2003, p. 20), an independent director is defined as a non-executive director who:

- (1) is not a substantial shareholder of the company or an officer of, or otherwise associated directly with, a substantial shareholder of the company;
- (2) within the last 3 years has not been employed in an executive capacity by the company or another group member, or been a director after ceasing to hold any such appointment;
- (3) within the last 3 years has not been a principal of a material professional adviser or a material consultant to the company or another group member, or an employee materially associated with the service provided;
- (4) is not a material supplier or customer of the company or other group member, or an officer of or otherwise associated directly or indirectly with a material supplier or customer;
- (5) has no material contractual relationship with the company or another group member other than as a director of the company;
- (6) has not served on the board for a period which could, or could reasonably be perceived to, materially interfere with the director's ability to act in the best interests of the company; or
- (7) is free from any interest and any business or other relationship which could, or could reasonably be perceived to, materially interfere with the director's ability to act in the best interests of the company.

The identification of whether the directors on the sample companies' audit committees were independent according to this definition was based solely on information disclosed in the companies' annual reports. The following areas of the annual reports were analysed to obtain the information necessary to determine the independence of the directors: information on the directors' experience, qualifications and background in the directors' reports; corporate governance statements; listings of significant shareholders; related party disclosures; director remuneration notes; loans

disclosures; and economic dependency disclosures<sup>3</sup>. After assessing the independence of each audit committee director, they were coded as 1 if they were considered independent or 0 if they were considered non-independent.

Consistent with the approach taken by Stapledon and Lawrence (1997), when assessing the independence or otherwise of individual audit committee members based on annual report disclosures, a number of assumptions were made. First, in accordance with s. 9 of the *Corporations Act 2001*, a substantial shareholder was defined as a person who had a relevant interest<sup>4</sup> in at least five percent of the voting shares of the company. The ASX Corporate Governance Council (2003) also used the same definition of a substantial shareholder. Second, professional advisers included those directors who were solicitors, accountants, auditors or bankers to the company. Third, due to the limited details often disclosed about directors' involvement in contractual relationships with the company, any relationship disclosed in the annual report was considered significant for the purpose of determining the directors' independence (Stapledon and Lawrence 1997). Similar assumptions were also made in the studies by Clifford and Evans (1997) and Cotter and Silvester (2003).

Having assessed the independence of each audit committee director, the next step was to decide upon the appropriate measure of overall audit committee independence. The measure used was the proportion of audit committee members who were categorised as independent directors. This variable was named ACIND and has been commonly used in the literature by papers including Carcello and Neal (2000); Klein (2002a) and Klein (2002b) and Cotter and Silvester (2003).

### 3.6.3 Audit committee expertise

Hypotheses 3a and 3b refer to the association between the expertise of the audit committee and financial reporting quality. Two variables were used to measure the extent of audit committee expertise.

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<sup>3</sup> Public companies are required by s. 300 of the *Corporations Act 2001* to disclose in their annual reports: details of each directors' qualifications, experience and special responsibilities (s. 300(10)(a)); the number of meetings of each board committee held during the year and each director's attendance at those meetings (s. 300(10)(c)); each directors' relevant interests in shares of the company or a related body corporate (s. 300(11)(a)); and contracts to which each director is a party or under which the director is entitled to a benefit (s. 300(11)(d)(i)).

<sup>4</sup> Section 608 of the *Corporations Act 2001* defines a relevant interest in securities as one where a person: is the holder of the securities; has the power to exercise, or control the exercise of, a right to vote attached to the securities; or has power to dispose of, or control the exercise of a power to dispose of, the securities.

First, similar to papers such as Van der Zahn and Tower (2004) and Bedard, Chtourou and Courteau (2004), the expertise of individual audit committee members was measured by whether they had professional accounting qualifications such as being either a Certified Practising Accountant (CPA) or a Chartered Accountant (CA). The logic behind this measure was that people holding such qualifications should have a relatively higher level of accounting knowledge than people without such qualifications. While somewhat arbitrary, this measure is relatively objective and therefore did not involve making value judgements as to whether directors had relevant expertise. Therefore, the first audit committee expertise variable used was measured as a continuous variable, i.e., the proportion of audit committee members with professional accounting qualifications. This variable was named ACACCEXP.

Second, audit committee member expertise was also measured by whether the directors had professional legal qualifications. A similar measurement is also used in papers such as Xie, Davidson and DaDalt (2003a) and Van der Zahn and Tower (2004). The logic here is that directors who hold professional legal qualifications are likely to have greater knowledge of their fiduciary duties and the legal requirements regarding financial reporting than other directors. Therefore, the second audit committee expertise variable used was also measured as a continuous variable, i.e., the proportion of audit committee members with professional legal qualifications. This variable was named ACLEGEXP.

### **3.6.4 Audit committee activity**

Hypotheses 4a and 4b refer to the association between the activity of the audit committee and financial reporting quality. Audit committee activity was measured by the number of audit committee meetings held during the year (ACMEET). This information must be disclosed in company annual reports according to s 300(10)(c) of the *Corporations Act 2001*. Xie, Davidson and DaDalt (2003a) and Van der Zahn and Tower (2004) also used the number of audit committee meetings as a measure of audit committee activity.

### **3.6.5 Audit committee size**

Hypotheses 5a and 5b suggest that the size of the audit committee is associated with financial reporting quality. Audit committee size (ACSIZE) was measured by the number of directors on the audit committee. This variable has been

tested in a number of previous studies (Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Davidson, Goodwin-Stewart and Kent 2005).

### **3.6.6 Audit committee tenure**

Hypothesis 6 proposes an association between the tenure of the audit committee and financial reporting quality. Audit committee tenure (ACTENURE) was measured as the number of years since the audit committee was formed. This was calculated as the difference between 2001 and the year of audit committee formation.

### **3.6.7 Control variables**

In order to test the association between financial reporting quality and the various audit committee variables discussed in the previous sections, it was important to include control variables that could be associated with financial reporting quality and/or audit committees. The board of directors, the external auditors and the audit committee each contribute to effective corporate governance and ultimately the quality of financial reporting (Blue Ribbon Committee 1999).

As the board of directors directly controls audit committee membership, it determines the level of independence and expertise of the audit committee. Furthermore, as the board approves the audit committee's charter, the board influences the frequency of audit committee meetings and the responsibilities of the committee. The more board meetings that are held, the greater may be the number of audit committee meetings to address the financial reporting and other issues raised by the board. As the board formally approves the financial statements prepared by management, it would be able to influence the quality of financial reporting. Therefore, based on prior research (Beasley and Salterio 2001; Klein 2002b; Peasnell, Pope and Young 2005), the following board of director characteristics were included as control variables: the number of directors on the board (BDSIZE); the proportion of independent directors serving on the board (BDIND); the proportion of board members with professional accounting qualifications (BDACCEXP); the proportion of board members with professional legal qualifications (BDLEGEXP); and the number of board meetings for the year (BDMEET).

The external auditor can also play a major role in determining audit committee characteristics and financial reporting quality. Higher quality auditors are expected to

have greater incentives to encourage their clients' boards of directors to improve the independence and expertise of audit committee members. This is because these audit committee characteristics are likely to influence financial reporting quality. If higher quality auditors are determined by their size, because of their larger client base, such larger auditors have more to lose in the event of a loss of reputation (Becker et al. 1998). This loss of reputation can occur if it becomes known in the community that the auditors are associated with clients that engage in earnings management that reduces the quality of their financial reporting. The larger potential loss for higher quality auditors results in a relatively greater incentive to remain independent of their clients compared to lower quality auditors that have a much smaller client base (Becker et al. 1998). Being associated with clients whose audit committees have higher levels of independence and expertise can enhance the auditor's independence.

As it can be argued that higher quality auditors have more to lose from a loss of reputation in the event of audit failure, they also have greater incentives to detect and reveal management misreporting resulting from earnings management (Becker et al. 1998). Therefore, to control for the potential effect of audit quality on the audit committee characteristics and financial reporting quality, a control variable was included (AUDITOR). It was coded as 1 if the company's auditor was a Big 5 or 6 firm<sup>5</sup> and 0 otherwise. This measure of audit quality has often been used in the literature (Watkins, Hillison and Morecroft 2004).

A number of other control variables that may influence audit committee characteristics and/or financial reporting quality were also included. These variables were: company size as measured by the natural log of total assets (LNSIZE); leverage (LEV) as measured by the ratio of total liabilities to total assets; and a series of industry dummy variables to control for any industry specific effects. A series of time indicator dummy variables was included in the tests that focussed on the change in the audit committee characteristics and financial reporting quality to control for any year specific effects. Larger firms may be more likely to have an audit committee because they have more resources to support such a corporate governance mechanism. Furthermore, the audit committees of larger firms are likely to have greater

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<sup>5</sup> Previously, the Big 6 accounting firms comprised Price Waterhouse, Coopers & Lybrand, Deloitte Touche Tohmatsu, Ernst and Young, KPMG Peat Marwick and Arthur Andersen. Following the merger of Price Waterhouse and Coopers and Lybrand in 1997, the Big 6 then became known as the Big 5. The period of study of this research included the periods both pre and post the merger of Price Waterhouse and Coopers & Lybrand.

independence, be larger and meet more often because of the greater resources they have at their disposal. Firms with higher leverage may be closer to their debt covenant constraints and therefore have greater incentives to manage their earnings, thereby adversely affecting financial reporting quality.

### **3.7 Empirical tests of hypotheses**

This section explains the empirical tests carried out to test the hypotheses developed in Chapter 2. First, section 3.7.1 describes the tests relating to the hypothesis on the association between the formation of an audit committee and financial reporting quality. Third, section 3.7.2 explains the tests concerning the hypotheses relating to audit committee characteristics and financial reporting quality. Finally, section 3.7.3 outlines the tests related to the hypotheses on the association between changes in audit committee characteristics and changes in financial reporting quality.

#### **3.7.1 Audit committee formation and financial reporting quality**

To test for the effect of the formation of an audit committee on financial reporting quality, a comparison was made of the earnings quality variables in the year before and the year after the audit committees were formed. This involved the re-estimation of the earnings quality variables from both the Jones (1991) and Dechow and Dichev (2002) models in the years before and after audit committee formation. The comparison of the variables was done to determine whether there were any statistically significant differences in earnings quality as a result of the formation of the audit committees. Both the parametric matched-pairs t-test and the non-parametric Wilcoxon signed ranks test in SPSS were used for this purpose. The t-test analysed the differences in the means of the earnings quality variables in the years before and after audit committee formation. To allow for possible violations of the main assumptions of the t-test, the non-parametric Wilcoxon signed ranks test was also used. This test also looked for significant differences in the earnings quality variables in the years before and after audit committee formation, which was done on the basis of the differences between negative and positive ranks. Negative ranks represented where the earnings quality variables in the year after audit committee formation were less than the same variable in the year before formation. Positive ranks were the opposite of negative ranks.



The measurement of the three earnings quality variables used in this research was discussed earlier in this Chapter. The absolute values of the earnings quality variables were used because the tests described in the previous paragraph were designed to determine if there was a significant difference in earnings quality between the years before and after audit committee formation. In doing so, the sign of the earnings quality variables was not relevant because their absolute value captured the level of earnings quality. The higher the absolute value of the earnings quality variables, the lower was the earnings quality and vice versa. For example when using the t-test, if the mean absolute value of the earnings quality variables was lower in the year after audit committee formation, this suggested that the earnings quality had improved following formation.

### 3.7.2 Audit committee characteristics and financial reporting quality

Hypotheses 2a, 3a, 4a, 5a and 6 propose that financial reporting quality is positively associated with the independence of the audit committee, its expertise, its activity, its size and its tenure. Therefore, to test these hypotheses, the following regression model for earnings quality was estimated for all firms  $k$  in the sample with an audit committee for year  $t$ . This model was run on the full random sample of 208 top 500 ASX listed companies with an audit committee in 2001:

$$\begin{aligned} EQ_{k,t} = a_t + \sum & b_{0t} \text{INDUSTRY} + b_{1t} \text{ACIND} + b_{2t} \text{ACACCEXP} + \\ & b_{3t} \text{ACLEGEXP} + b_{4t} \text{ACMEET} + b_{5t} \text{ACSIZE} + b_{6t} \text{ACTENURE} + \\ & b_{7t} \text{BDSize} + b_{8t} \text{BDIND} + b_{9t} \text{BDACCEXP} + b_{10t} \text{BDLEGEXP} + \\ & b_{11t} \text{BDMEET} + b_{12t} \text{AUDITOR} + b_{13t} \text{LNSIZE} + b_{14t} \text{LEV} + \varepsilon_t \end{aligned} \quad (8)$$

The terms in this model were measured as follows:

$EQ_{k,t}$  = The measures for earnings quality calculated from the cross-sectional modified Jones (1991) and Dechow and Dichev (2002) models;

$\text{INDUSTRY}$  = A series of industry dummy variables: 1 = a company was from a particular industry group and 0 = otherwise.

$\text{ACIND}$  = The proportion of independent directors on the audit committee;

$\text{ACACCEXP}$  = The proportion of audit committee members with professional accounting qualifications;

ACLEGEXP = The proportion of audit committee members with professional legal qualifications;

ACMEET = The number of audit committee meetings for the year;

ACSIZE = The number of directors on the audit committee;

ACTENURE = The number of years between the year in which the audit committee was formed and 2001;

BDSIZE = The number of directors on the board;

BDIND = The proportion of independent directors on the board;

BDACCEXP = The proportion of board members with professional accounting qualifications;

BDLEGEXP = The proportion of board members with professional legal qualifications;

BDMEET = The number of board meetings for the year;

AUDITOR: 1 = a company's auditor was a Big 5 or 6 firm and 0 = otherwise;

LNSIZE = The natural log of total assets;

LEV = The ratio of total liabilities to total assets.

Some of the variables contained in equation (8) require further explanation.

First, the absolute values of the EQ variables were used because the sign of the variables was not relevant in determining the level of earnings quality. This is because lower absolute values for the EQ variables indicated higher earnings quality and vice versa. Therefore, there was an inverse relation between the absolute value of the EQ variables and earnings quality and ultimately financial reporting quality.

Consequently, based on hypotheses 2a, 3a, 4a, 5a and 6, it was predicted that there would be a negative relation between the audit committee variables and the absolute values of the earnings quality variables because of this inverse relation. Second, for those companies in the sample that formed their audit committee prior to 1 July 1993, 1993 was arbitrarily selected as the year of audit committee formation for the purpose of calculating ACTENURE. Similarly, for those companies in the sample that listed on the ASX already with an audit committee, the year after listing was chosen as the year of audit committee formation.

### 3.7.3 Changes in audit committee characteristics and financial reporting quality

Hypotheses 2b, 3b, 4b and 5b propose that an increase in financial reporting quality is positively associated with increases in the independence of the audit committee, its expertise, activity and size. Therefore, to further analyse the effect of the changes in audit committee characteristics on financial reporting quality, a similar regression model to equation (8) was also run. It focused on the changes in the characteristics and the changes in the earnings quality variables between the year after the formation of the audit committee and 2001. The regression model for this was as follows:

$$\begin{aligned} \Delta EQ_{k,t} = a_t + \sum b_{0t} \text{INDUSTRY} + \sum_{Y=93}^{01} b_{1Y} \text{YEAR} + b_{2t} \Delta \text{ACIND} + \\ b_{3t} \Delta \text{ACACCEXP} + b_{4t} \Delta \text{ACLEGEXP} + b_{5t} \Delta \text{ACMEET} + \\ b_{6t} \Delta \text{ACSIZE} + b_{7t} \Delta \text{BDSIZE} + b_{8t} \Delta \text{BDIND} + \\ b_{9t} \Delta \text{BDACCEXP} + b_{10t} \Delta \text{BDLEGEXP} + b_{11t} \Delta \text{BDMEET} + \\ b_{12t} \Delta \text{AUDITOR} + b_{13t} \text{LN}\Delta \text{SIZE} + b_{14t} \Delta \text{LEV} + \varepsilon_t \end{aligned} \quad (9)$$

The variables in this model were measured as follows:

$\Delta EQ_{k,t}$  = The change in the measures for earnings quality calculated from the cross-sectional modified Jones (1991) and Dechow and Dichev (2002) models;

INDUSTRY = A series of industry dummy variables: 1 = a company was from a particular industry group and 0 = otherwise;

YEAR = A series of time indicator dummy variables: 1 = the year after audit committee formation was a given year and 0 = otherwise;

$\Delta \text{ACIND}$  = The change in the proportion of independent directors on the audit committee;

$\Delta \text{ACACCEXP}$  = The change in the proportion of audit committee members with professional accounting qualifications;

$\Delta \text{ACLEGEXP}$  = The change in the proportion of audit committee members with professional legal qualifications;

$\Delta \text{ACMEET}$  = The change in the number of audit committee meetings;

$\Delta \text{ACSIZE}$  = The change in the number of directors on the audit committee;

$\Delta \text{BDSIZE}$  = The change in the number of directors on the board;

$\Delta$  BDIND = The change in the proportion of independent directors on the board;

$\Delta$  BDACCEXP = The change in the proportion of board members with professional accounting qualifications;

$\Delta$  BDLEGEXP = The change in the proportion of board members with professional legal qualifications;

$\Delta$  BDMEET = The change in the number of board meetings;

$\Delta$  AUDITOR: 1 = a company with a non-Big 5/6 audit firm has changed to a Big 5/6 audit firm; 0 = otherwise;

$\text{LN}\Delta\text{SIZE}$  = The natural log of the change in total assets;

$\Delta$  LEV = The change in the ratio of total liabilities to total assets.

Some issues relating to equation (9) require further explanation. First, the model was run on the sub-sample of the original 208 company random sample for which company annual report data could be obtained in the year after audit committee formation. This sub-sample was 136 companies. Second, the change variables were calculated as the difference between the value of the variable in 2001 and its value in the year after audit committee formation. For those companies that formed their audit committees prior to 1 July 1993, 1993 was selected as the year of formation of their audit committee. Furthermore, some companies in the sample already had an audit committee when they listed on the ASX. Therefore, the year after listing was used as the year of audit committee formation.

Finally, changes in the earnings quality variables were calculated based on the absolute values of the variables in the years after audit committee formation and 2001. This was done because the absolute values and not the signs of the variables were relevant in determining the extent of earnings quality. Furthermore, based on hypotheses 2b, 3b, 4b and 5b, it was predicted that there would be a negative association between the change in the audit committee characteristic variables and the change in the earnings quality variables. This arose because of the inverse relation between the values of the earnings quality change variables and the extent of earnings quality and therefore financial reporting quality. Lower values on the variables represented higher earnings quality and vice versa.

There is a potential endogeneity issue, whereby the formation and characteristics of audit committees may not necessarily be independent of financial reporting quality. It is possible that firms with high quality financial reporting will

create high quality audit committees, rather than high quality audit committees leading to better financial reporting. In this regard, Engel (2005) argued that firms might use a high quality audit committee to signal the strength of their existing financial reporting system. The formation and changes tests discussed in this Chapter aimed to overcome these issues.

### **3.8 Conclusion**

This Chapter explains the method that was used to test the hypotheses developed in section 2.6 of Chapter 2. First, there is a justification for the use of archival data to perform the statistical tests and a discussion of why various alternative approaches to measuring financial reporting quality were not used. Second, the population from which the sample was selected is discussed, along with an explanation of the main sources of data used. Third, the measurement of the earnings quality variables from the modified cross-sectional Jones (1991) model and the Dechow and Dichev (2002) model is explained. Fourth, there is an explanation of how the independent and control variables were measured. Finally, the main empirical tests undertaken in this research are outlined. Chapter 4 presents an analysis of the results obtained from these tests.

## **4 Analysis of Results**

### **4.1 Introduction**

This Chapter analyses the results from the statistical tests undertaken in this research and explained in Chapter 3. It does not draw conclusions from the results, nor suggest implications for theory, policy or practice. These issues are covered in Chapter 5. The current Chapter is organised as follows: section 4.2 provides details of the population from which the sample was drawn; section 4.3 outlines information about the samples used in the statistical tests; section 4.4 explains the results obtained from the tests examining the association between audit committee formation and financial reporting quality; section 4.5 discusses the results from the tests on the association between the characteristics of audit committees and financial reporting quality; section 4.6 details the test results on the association between the changes in these characteristics and the changes in financial reporting quality; and section 4.7 concludes the Chapter by summarising its main themes.

### **4.2 Population**

As explained in Chapter 3, the population from which the initial sample was drawn was the top 500 Australian companies listed on the Australian Stock Exchange (ASX) with financial years ending during 2001. Section 3.3.2 of Chapter 3 outlines the process used to identify which of these companies did and did not have an audit committee in 2001. Trusts, foreign companies domiciled outside Australia and banks were excluded from the population prior to selecting the sample. Consequently, 463 companies remained from the top 500. Of these, 422 (91.1%) companies had an audit committee, 37 (8%) companies did not have an audit committee and for 4 (0.9%) companies it could not be determined whether they had an audit committee. Table 4.1 below summarises this data:

**Table 4.1 Top 500 ASX listed companies with and without an audit committee in 2001**

	<b>Number of companies</b>	<b>Percentage</b>
Companies with an audit committee	422	91.1
Companies without an audit committee	37	8.0
Could not be determined	4	0.9
Total	463	100

One of the major functions usually associated with an audit committee is to monitor and improve the quality of a company's financial reports. For those top 500 companies with an audit committee in 2001, the annual report disclosures regarding the committee's functions were analysed. Of the 422 companies with an audit committee, 375 (88.8%) disclosed that part of their audit committee's functions was to improve the quality of the company's financial reports. For some companies this was explicitly stated, such as for Amalgamated Holdings Ltd:

The committee also gives the Board additional assurance regarding the quality and reliability of financial information prepared for use by the Board in determining policies for inclusion in financial statements.

Whereas for other companies, such as Futuris Corporation Ltd , this was more implicit:

The terms of reference which have been adopted by the Audit Committee are:

\* Reviewing annual and half yearly reports and Australian Stock Exchange releases.

If the companies chose not to establish an audit committee they were required under ASX listing rules to disclose the reasons for not establishing one. For the 37 companies in 2001 without an audit committee, the reasons they disclosed in their annual reports were analysed. Twenty companies disclosed they had not yet formed a separate audit committee because the duties of the committee were being handled by the full board of directors. Sixteen companies disclosed that they did not believe that an audit committee was necessary because of their company's size, nature or structure. Table 4.2 summarises the reasons disclosed:

**Table 4.2 Reasons disclosed for not forming an audit committee by 37 ASX listed companies in their 2001 annual reports**

<b>Reason for no audit committee</b>	<b>Number of companies</b>
Audit committee duties handled by the full board	20
Not necessary due to company size, nature and/or structure	16
Other reasons	4
Total	40
(Note: some companies disclosed more than one reason)	

### **4.3 Samples used in empirical tests**

There were three main groups of tests used to test the hypotheses developed in section 2.6 of Chapter 2. The sample companies used for these tests were derived from the random sample of 208 top 500 ASX listed companies with an audit committee in 2001. The process used in selecting this sample was discussed in section 3.3.2 of Chapter 3.

The first group of tests examined the association between the formation of an audit committee and financial reporting quality. Companies whose audit committees were formed prior to 1993 and those companies that listed on the ASX with an audit committee were excluded from the sample of companies used in the audit committee formation tests. Therefore, this left a sample of 69 companies that formed their audit committees after 1993 or later and did not list on the ASX with an audit committee. From these companies, 11 were excluded because of the unavailability of their annual reports on the databases described in section 3.4 of Chapter 3. This meant that a final sample of 58 companies were included in the tests on the association between the formation of an audit committee and financial reporting quality. Table 4.3 summarises these details:



**Table 4.3 Sample companies used in tests on audit committee formation and financial reporting quality**

	<b>Number of companies</b>
Initial random sample	208
Companies excluded because their audit committees were formed pre 1993 or they listed on the ASX with an audit committee	139
Companies excluded due to unavailability of their annual reports	11
Final sample	58

The second group of tests analysed the association between audit committee characteristics and financial reporting quality. These tests were conducted using 2001 annual report data for the initial 208 company random sample. The selection of this sample is explained further in section 3.3.2.

The third group of tests focussed on the association between changes in the audit committee characteristics and changes in financial reporting quality. These tests were based on the changes in their variables between the year after audit committee formation and 2001. The sample companies used for these tests were also derived from the random sample of 208 top 500 ASX listed companies with an audit committee in 2001. A final sample of 136 companies remained after excluding those companies whose annual reports could not be located for the year after audit committee formation.

## **4.4 Audit committee formation and financial reporting quality**

### **4.4.1 Descriptive statistics**

Table 4.4 provides the descriptive statistics for the three earnings quality variables in the year before and the year after the formation of the sample companies' audit committees. As the table shows, there were reasonably high values for skewness and kurtosis for most of the variables. A total of six outliers were identified from an analysis of boxplots for each of the earnings quality variables. When these outliers were excluded and the descriptive statistics recalculated, the skewness values reduced to no more than 2.617 and the values for kurtosis reduced to no more than 8.442.

**Table 4.4 Descriptive statistics for 58 ASX listed companies for earnings quality variables in years pre and post audit committee formation**

<b>Variable</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
EQJonespre	0.007995	2.220238	0.28627	0.34595	3.374	16.474
EQJonespost	0.000377	6.573586	0.30905	0.89015	6.437	44.864
EQDDpre	0.001275	0.501794	0.10248	0.12292	1.865	3.015
EQDDpost	0.001004	2.950057	0.13948	0.38793	6.914	50.556
EQDDadjpre	0.000356	0.613159	0.08567	0.11168	2.776	9.184
EQDDadjpost	0.000666	2.705745	0.13656	0.36339	6.495	45.673

EQJonespre = Cross sectional earnings quality proxy from modified Jones (1991) model in year before audit committee formation (i.e., absolute value of abnormal accruals)

EQJonespost = Cross sectional earnings quality proxy from modified Jones (1991) model in year after audit committee formation (i.e., absolute value of abnormal accruals)

EQDDpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year after audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year after audit committee formation (i.e., absolute value of regression residuals)

Table 4.5 provides a breakdown of the numbers of audit committees formed in each year. This table excludes those companies that listed on the ASX with an audit committee and those for which annual reports were not available. For the 120 companies reported in table 4.5, the majority of audit committees were formed before 1993.

**Table 4.5 Number of audit committees formed each year by 120 ASX listed companies**

<b>Year of audit committee formation</b>	<b>Number of companies</b>
Pre 1993	62
1993	6
1994	11
1995	11
1996	10
1997	7
1998	8
1999	5
Total	120

#### **4.4.2 T-test results**

Table 4.6 shows the results of the parametric matched-pairs t-test performed to compare the earnings quality variables in the years before and after audit committee formation. For the purpose of these tests, the six outliers referred to above were excluded from the analysis, which reduced the sample for these tests to 52 companies. For the earnings quality variables derived from the modified Jones (1991) model, the mean for EQJonespost (0.16741) was less than the mean for EQJonespre (0.25202) and the difference in the means was significant at the 0.01 level. There is an inverse relation between the value of the earnings quality variables and the level of earnings quality. This result suggests that earnings quality calculated based on the Jones (1991) model was significantly higher in the year after the formation of the audit committees compared to the year before audit committee formation. Therefore, this supports H1.

For the first set of earnings quality variables derived from the Dechow and Dichev (2002) model, the mean for EQDDpost (0.08270) was less than the mean for EQDDpre (0.08948), but the difference in the means was not significant. For the second set of earnings quality variables derived from the Dechow and Dichev (2002) model, the mean for EQDDadjpost (0.08257) was greater than the mean for EQDDadjpre (0.07603), but the difference in the means was not significant. These results suggest that there was no significant difference in earnings quality calculated

from the Dechow and Dichev (2002) model between the years before and after audit committee formation. This does not support H1<sup>6</sup>.

**Table 4.6 T-tests comparing earnings quality variables in the years pre and post audit committee formation for 52 ASX listed companies**

Variable	Mean	t	df	Sig.*
EQJonespre	0.25202	3.213	51	0.001
EQJonespost	0.16741			
EQDDpre	0.08948	0.348	51	0.365
EQDDpost	0.08270			
EQDDadjpre	0.07603	-0.385	51	0.702
EQDDadjpost	0.08257			

\*p-values are one-tailed when direction is as predicted, otherwise two-tailed.

EQJonespre = Cross sectional earnings quality proxy from modified Jones (1991) model in year before audit committee formation (i.e., absolute value of abnormal accruals)

EQJonespost = Cross sectional earnings quality proxy from modified Jones (1991) model in year after audit committee formation (i.e., absolute value of abnormal accruals)

EQDDpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year after audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year after audit committee formation (i.e., absolute value of regression residuals)

#### 4.4.3 Wilcoxon signed ranks test results

Due to the high values for skewness and kurtosis for the earnings quality variables indicated in table 4.4, the non-parametric Wilcoxon signed ranks test was also used. As this type of test is not influenced by the existence of outliers, the full sample of 58 companies was used. Table 4.7 reports the results of the Wilcoxon tests undertaken. Negative ranks refer to situations where the earnings quality variables in the year after the formation of the audit committee were less than the year before formation. Positive ranks refer to the opposite where the earnings quality variables in the year after formation were greater than the year before formation.

For the earnings quality variables derived from the modified Jones (1991) model (EQJonespre and EQJonespost), there were more negative ranks than positive ranks and the difference was significant at the 0.01 level. This suggests that earnings

<sup>6</sup> When the six outliers were included, the difference between the means of EQJonespre and EQJonespost was not significant. Similar results were obtained for both of the EQDD variables. This supports the exclusion of the outliers from the t-test results reported in table 4.6.

quality based on the Jones (1991) model was significantly higher in the year after audit committee formation compared to the year before formation. For the first set of earnings quality variables from the Dechow and Dichev (2002) model (EQDDpre and EQDDpost), there were more positive ranks than negative ranks. However the difference is not significant. A similar result was obtained for the second set of Dechow and Dichev (2002) earnings quality variables (EQDDadjpre and EQDDadjpost). Overall, the results of the Wilcoxon signed ranks tests are consistent with the results of the t-tests reported in table 4.6.

**Table 4.7 Wilcoxon signed ranks tests comparing earnings quality variables in the years pre and post audit committee formation for 58 ASX listed companies**

Test	Ranks <sup>g</sup>	N	Z-score	Sig.*
EQJonespost – EQJonespre	Negative ranks	36 <sup>a</sup>	-2.443	0.008
	Positive ranks	22 <sup>b</sup>		
EQDDpost – EQDDpreabs	Negative ranks	27 <sup>c</sup>	-0.484	0.628
	Positive ranks	31 <sup>d</sup>		
EQDDadjpost – EQDDadjpre	Negative ranks	27 <sup>e</sup>	-0.879	0.380
	Positive ranks	31 <sup>f</sup>		

\*p-values are one-tailed when direction is as predicted, otherwise two-tailed.

a: EQJonespost < EQJonespre

b: EQJonespost > EQJonespre

c: EQDDpost < EQDDpreabs

d: EQDDpost > EQDDpreabs

e: EQDDadjpost < EQDDadjpre

f: EQDDadjpost > EQDDadjpre

g: Negative ranks = higher earnings quality in year after audit committee formation; Positive ranks = lower earnings quality in year after audit committee formation.

EQJonespre = Cross sectional earnings quality proxy from modified Jones (1991) model in year before audit committee formation (i.e., absolute value of abnormal accruals)

EQJonespost = Cross sectional earnings quality proxy from modified Jones (1991) model in year after audit committee formation (i.e., absolute value of abnormal accruals)

EQDDpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model in year after audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpre = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year before audit committee formation (i.e., absolute value of regression residuals)

EQDDadjpost = Cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables in year after audit committee formation (i.e., absolute value of regression residuals)

## 4.5 Audit committee characteristics and financial reporting quality

### 4.5.1 Descriptive statistics

Table 4.8 provides the descriptive statistics for the variables used in the models analysing the association between audit committee characteristics and financial reporting quality. Panel A shows the descriptive statistics for each of the continuous variables, while Panel B reports details of the dummy variable.

Panel A indicates that each of the 3 dependent variables, i.e., EQJones, EQDD and EQDDadj, had reasonably high values for skewness and kurtosis. This suggested that these variables were not normally distributed. Therefore, several variable transformations were trialled in an attempt to improve the distributions. Of these, a reciprocal transformation was found to reduce the skewness and kurtosis statistics to the lowest level. The descriptive statistics for the transformed variables are also provided in table 4.8. The regression models were run using both the untransformed and reciprocal transformed dependent variables. These results are discussed further in section 4.5.3.

The audit committee variables were: independence (ACIND) measured as the proportion of independent directors on the audit committee; accounting expertise (ACACCEXP) measured as the proportion of audit committee directors with accounting expertise; legal expertise (ACLEGEXP) measured as the proportion of directors on the audit committee with legal qualifications; meetings (ACMEET) measured as the number of audit committee meetings held during the year; size (ACSIZE) measured as the number of audit committee members; and tenure (ACTENURE) measured as the number of years since the audit committee was formed.

Panel A of table 4.8 shows that the proportion of independent audit committee members ranged between 0 and 1, with the average being 0.5241. For the proportion of audit committee members with accounting expertise, there was a range of between 0 and 1, with an average of 0.3226. For the proportion of audit committee members with legal expertise, there was a range of between 0 and 1, with an average of 0.1299. The audit committees met between 0 and 9 times during the year, with an average of approximately 3 meetings per year. The sizes of the audit committees ranged between 2 and 7 members with an average of approximately 3 members. There was a range of

between 0 and 8 years since the audit committees were formed, with an average audit committee tenure of approximately 6 years.

These descriptive statistics indicate that there was considerable variation in these audit committee variables for the sample companies. Prior US studies such as Yang and Krishnan (2005) provide evidence that audit committees in the United States have much higher proportions of independent directors, which reflects the greater degree of audit committee regulation. This further supports the use of Australian data in this research to avoid the confounding effect of regulation.

The control variables used were a number of board variables, company size, leverage and auditor size. Panel A shows that, on average, the boards of the sample companies had: 0.4131 of members who were independent; 0.2263 of members with accounting expertise and 0.11 of members with legal expertise. The boards met an average of 11.5 times per year and had an average of 6 members. Company size, as measured by total assets, initially had very high values for skewness and kurtosis. Therefore, as is common in the literature, this variable was transformed using a natural log transformation. This transformation reduced the skewness and kurtosis statistics to 0.632 and 0.338 respectively. The leverage variable also had reasonably high statistics for skewness and kurtosis. This was dealt with by the identification and elimination of several multivariate outliers in the regression analysis. Panel B shows that 170 (81.7%) of the 208 companies in the sample had a Big 5 or 6 auditor and 38 companies (18.3%) had a non-Big 5 or 6 auditor.

**Table 4.8 Descriptive statistics for 208 randomly selected ASX listed companies in 2001**

<b>Panel A Continuous variables</b>						
<b>Variable</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
EQJones	0.000571	1.198636	0.141464	0.172656	2.767	9.612
REQJones	0.45	1.00	0.8911	0.10179	-1.7178	3.034
EQDD	0.000151	1.339401	0.098693	0.160222	5.022	30.834
REQDD	0.43	1.00	0.9222	0.08633	-3.004	11.766
EQDDadj	0.000382	1.284198	0.096257	0.156534	4.824	28.311
REQDDadj	0.44	1.00	0.9240	0.08606	-2.983	11.320
ACIND	0	1.00	0.5241	0.33585	-0.107	-1.055
ACACCEXP	0	1.00	0.3226	0.29550	0.639	-0.388
ACLEGEXP	0	1.00	0.1299	0.19521	1.448	1.827
ACMEET	0	9	3.04	1.427	1.150	1.832
ACSIZE	2	7	3.18	1.019	1.257	2.224
ACTENURE	0	8	5.82	2.177	-0.625	-0.798
BDIND	0	1.00	0.4131	0.25265	0.073	-0.848
BDACCEXP	0	0.75	0.2263	0.17909	0.581	-0.159
BDLEGEXP	0	0.50	0.1100	0.12981	1.049	0.409
BDMEET	3	33	11.48	4.334	1.000	3.297
BDSIZE	3	17	6.33	2.286	1.515	3.913
SIZE	5650579	84961000000	1615996080	7273099264	8.830	89.928
LNSIZE	15.54726	25.16545	19.13459	1.79745	0.632	0.338
LEV	0.006833	2.52071	0.49303	0.27621	2.989	19.940
<b>Panel B Dichotomous variables</b>						
<b>Variable</b>	<b>Frequency of 1s</b>		<b>Frequency of 0s</b>			
AUDITOR	170 (81.7%)		38 (18.3%)			

EQJones = Cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

REQJones = Reciprocal of EQJones

EQDD = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

REQDD = Reciprocal of EQDD

EQDDadj = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

REQDDadj = Reciprocal of EQDDadj

ACIND = Proportion of independent directors on audit committee

ACACCEXP = Proportion of directors on audit committee with accounting qualifications

ACLEGEXP = Proportion of directors on audit committee with legal qualifications

ACMEET = Number of audit committee meetings

ACSIZE = Number of audit committee members

ACTENURE = Number of years since formation of audit committee

BDIND = Proportion of independent directors on the board

BDACCEXP = Proportion of directors on the board with accounting qualifications

BDLEGEXP = Proportion of directors on the board with legal qualifications

BDMEET = Number of board meetings

BDSIZE = Number of board members

SIZE = Total assets

LNSIZE = Natural log of total assets

LEV = Total liabilities divided by total assets

AUDITOR: 1 = Big 5 or 6 auditor; 0 = Non-big 5 or 6 auditor



### 4.5.2 Correlations

Table 4.9 reports the Pearson correlation coefficients between all combinations of dependent and independent variables. The two dependent variables based on the Dechow and Dichev (2002) model (EQDD and EQDDadj) were significantly positively correlated with a coefficient of 0.973. This was not surprising considering the variables were based on the same earnings quality model. While there were positive correlations between EQDD, EQDDadj and the Jones (1991) model dependent variables (EQJones), the correlations were not significant.

There were some significant correlations between the three dependent variables and several of the independent variables. The dependent variable based on the Jones (1991) model (EQJones), was significantly negatively correlated with the number of years since the formation of the audit committee (ACTENURE). Significant negative correlations existed between both EQDD and EQDDadj and board size (BDSIZE) and the natural log of total assets (LNSIZE). EQDD and EQDDadj were also significantly positively correlated with total liabilities divided by total assets (LEV). Due to the inverse relation between the value of the EQ variables and the level of earnings quality, this suggests that larger boards and larger companies are associated with higher quality earnings, while companies with higher leverage are associated with lower quality earnings.

A number of significant correlations also existed between the various independent variables. The following associated audit committee and board variables were significantly positively correlated (Pearson correlation coefficients are shown in brackets): ACIND and BDIND (0.777); ACACCEXP and BDACCEXP (0.788); ACLEGEXP and BDLEGEXP (0.712); ACMEET and BDMEET (0.148); and ACSIZE and BDSIZE (0.353). These results were not surprising considering that the audit committee comprises members of the board of directors. Therefore, due to significant correlations between these associated independent variables, the board variables were excluded from the regression models with the audit committee variables. The natural log of total assets (LNSIZE) was significantly correlated with many of the variables. This confirms the need to control for company size in the multivariate tests. Another interesting result was that the two measures of audit committee expertise (ACACCEXP and ACLEGEXP) were significantly negatively correlated with each other. This suggests that the two forms of expertise are

substitutes for each other. Therefore, the directors on audit committees tend to have either accounting or legal expertise, but not both.

Non-parametric Spearman correlations were also calculated because of possible violations of the normal distribution assumption as indicated in the descriptive statistics in table 4.8. Table 4.10 reports the Spearman correlation coefficients. As with the Pearson correlations in table 4.9, EQDD and EQDDadj were significantly positively correlated. These two variables were also positively correlated with EQJones. EQJones was negatively correlated with BDIND. EQDD was negatively correlated with ACIND, BDIND, BDSIZE and LNSIZE. EQDDadj was negatively correlated with ACSIZE, BDSIZE, AUDITOR and LNSIZE. These correlations suggest that higher proportions of independent directors on the audit committee and board, larger audit committees and boards, larger auditors and larger companies are associated with higher quality earnings.

There were some differences between the Pearson and Spearman correlations, relating to independent variables significantly correlated with the earnings quality variables. These may be due to the higher skewness and kurtosis with the untransformed earnings quality variables as indicated in table 4.8.

Similar to the Pearson correlations in table 4.9, table 4.10 highlights significant correlations between many of the independent variables. The same combinations of associated audit committee and board variables were positively correlated. The natural log of total assets (LNSIZE) was again significantly correlated with many of the variables. Furthermore, the two measures of audit committee expertise were also negatively correlated.

**Table 4.9 Pearson correlations for 208 randomly selected ASX listed companies in 2001**

	EQJones	EQDD	EQDDadj	ACIND	ACACCEXP	ACLEGEXP	ACMEET	ACSIZE	ACTENURE	BDIND	BDACCEXP	BDLEGEXP	BDMEET	BDSIZE	AUDITOR	LNSIZE	LEV
<b>EQJones</b>	1																
<b>EQDD</b>	0.081 (0.242)	1															
<b>EQDDadj</b>	0.114 (0.102)	0.973** (0.000)	1														
<b>ACIND</b>	-0.118 (0.090)	-0.102 (0.144)	-0.088 (0.204)	1													
<b>ACACCEXP</b>	-0.020 (0.770)	-0.070 (0.315)	-0.088 (0.204)	-0.101 (0.148)	1												
<b>ACLEGEXP</b>	-0.003 (0.966)	-0.094 (0.175)	-0.091 (0.190)	-0.067 (0.336)	-0.236** (0.001)	1											
<b>ACMEET</b>	-0.044 (0.524)	-0.052 (0.456)	-0.022 (0.749)	0.216** (0.002)	-0.044 (0.532)	0.035 (0.612)	1										
<b>ACSIZE</b>	0.088 (0.204)	-0.118 (0.090)	-0.133 (0.056)	0.040 (0.563)	-0.086 (0.214)	-0.062 (0.375)	0.151* (0.029)	1									
<b>ACTENURE</b>	-0.137* (0.048)	-0.003 (0.966)	-0.033 (0.637)	0.069 (0.325)	-0.056 (0.426)	0.029 (0.675)	0.086 (0.216)	-0.131 (0.060)	1								
<b>BDIND</b>	-0.075 (0.283)	-0.058 (0.404)	-0.044 (0.524)	0.777** (0.000)	-0.127 (0.069)	-0.127 (0.068)	0.239** (0.001)	0.138* (0.047)	0.102 (0.143)	1							
<b>BDACCEXP</b>	0.104 (0.137)	-0.077 (0.269)	-0.089 (0.204)	-0.110 (0.112)	0.788** (0.000)	-0.205** (0.003)	-0.038 (0.582)	0.027 (0.704)	-0.093 (0.181)	-0.129 (0.063)	1						
<b>BDLEGEXP</b>	0.009 (0.901)	0.031 (0.658)	0.027 (0.702)	-0.154* (0.026)	-0.118 (0.090)	0.712** (0.000)	0.066 (0.346)	-0.102 (0.143)	0.069 (0.325)	-0.146* (0.036)	-0.189** (0.006)	1					
<b>BDMEET</b>	0.063 (0.369)	-0.092 (0.185)	-0.087 (0.212)	-0.016 (0.817)	0.058 (0.408)	-0.080 (0.253)	0.148* (0.033)	0.035 (0.617)	-0.031 (0.655)	0.006 (0.933)	0.122 (0.079)	-0.050 (0.475)	1				
<b>BDSIZE</b>	-0.031 (0.659)	-0.199** (0.004)	-0.180** (0.014)	0.170* (0.014)	-0.043 (0.538)	0.075 (0.279)	0.305** (0.000)	0.353** (0.000)	0.120 (0.084)	0.180** (0.009)	-0.080 (0.249)	-0.023 (0.742)	-0.061 (0.379)	1			
<b>AUDITOR</b>	0.037 (0.596)	-0.108 (0.120)	-0.110 (0.114)	0.142* (0.041)	-0.118 (0.090)	0.104 (0.133)	0.091 (0.189)	0.109 (0.116)	0.109 (0.116)	0.225** (0.001)	-0.138* (0.047)	0.017 (0.802)	0.049 (0.481)	0.281** (0.000)	1		
<b>LNSIZE</b>	-0.064 (0.355)	-0.295** (0.000)	-0.284** (0.000)	0.211** (0.002)	-0.007 (0.916)	0.146* (0.036)	0.356** (0.000)	0.275** (0.000)	0.307** (0.000)	0.269** (0.000)	-0.029 (0.678)	0.068 (0.329)	0.064 (0.355)	0.636** (0.000)	0.357** (0.000)	1	
<b>LEV</b>	0.097 (0.163)	0.338** (0.000)	0.349** (0.000)	-0.106 (0.127)	-0.043 (0.539)	-0.021 (0.765)	-0.022 (0.755)	0.019 (0.783)	0.166* (0.016)	-0.084 (0.230)	-0.067 (0.337)	0.213** (0.002)	-0.054 (0.439)	-0.012 (0.866)	-0.024 (0.730)	0.167* (0.016)	1

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

EQJones = Cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

EQDD = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

EQDDadj = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

ACIND = Proportion of independent directors on audit committee  
ACACCEXP = Proportion of directors on audit committee with accounting qualifications  
ACLEGEXP = Proportion of directors on audit committee with legal qualifications  
ACMEET = Number of audit committee meetings  
ACSIZE = Number of audit committee members  
ACTENURE = Number of years since formation of audit committee  
BDIND = Proportion of independent directors on the board  
BDACCEXP = Proportion of directors on the board with accounting qualifications  
BDLEGEXP = Proportion of directors on the board with legal qualifications  
BDMEET = Number of board meetings  
BDSIZE = Number of board members  
AUDITOR: 1 = Big 5 or 6 auditor; 0 = Non-big 5 or 6 auditor  
LNSIZE = Natural log of total assets  
LEV = Total liabilities divided by total assets

**Table 4.10 Spearman correlations for 208 randomly selected ASX listed companies in 2001**

	EQJones	EQDD	EQDDadj	ACIND	ACACCEXP	ACLEGEXP	ACMEET	ACSIZE	ACTENURE	BDIND	BDACCEXP	BDLEGEXP	BDMEET	BDSIZE	AUDITOR	LNSIZE	LEV
<b>EQJones</b>	1																
<b>EQDD</b>	0.151* (0.029)	1															
<b>EQDDadj</b>	0.199** (0.004)	0.713** (0.000)	1														
<b>ACIND</b>	-0.127 (0.069)	-0.161* (0.020)	-0.114 (0.101)	1													
<b>ACACCEXP</b>	0.047 (0.496)	-0.025 (0.725)	-0.076 (0.278)	-0.126 (0.069)	1												
<b>ACLEGEXP</b>	0.053 (0.451)	-0.033 (0.631)	-0.035 (0.620)	-0.045 (0.519)	-0.179** (0.010)	1											
<b>ACMEET</b>	-0.079 (0.259)	-0.029 (0.675)	-0.026 (0.706)	0.220** (0.001)	-0.031 (0.660)	0.106 (0.127)	1										
<b>ACSIZE</b>	0.012 (0.866)	-0.076 (0.273)	-0.171* (0.014)	0.059 (0.397)	-0.038 (0.581)	0.044 (0.531)	0.198** (0.004)	1									
<b>ACTENURE</b>	-0.123 (0.077)	-0.063 (0.364)	-0.114 (0.101)	0.099 (0.157)	-0.087 (0.210)	0.067 (0.338)	0.165* (0.017)	-0.070 (0.316)	1								
<b>BDIND</b>	-0.154* (0.026)	-0.159* (0.022)	-0.115 (0.099)	0.778** (0.000)	-0.133 (0.055)	-0.083 (0.233)	0.262** (0.000)	0.147* (0.034)	0.124 (0.075)	1							
<b>BDACCEXP</b>	0.092 (0.186)	0.016 (0.818)	-0.002 (0.978)	-0.114 (0.100)	0.800** (0.000)	-0.155* (0.026)	-0.013 (0.851)	0.083 (0.236)	-0.140* (0.044)	-0.118 (0.091)	1						
<b>BDLEGEXP</b>	0.102 (0.141)	0.016 (0.813)	-0.036 (0.602)	-0.127 (0.067)	-0.105 (0.131)	0.700** (0.000)	0.128 (0.066)	-0.054 (0.441)	0.096 (0.166)	-0.115 (0.099)	-0.162* (0.019)	1					
<b>BDMEET</b>	0.014 (0.837)	-0.041 (0.559)	-0.058 (0.406)	0.030 (0.667)	0.062 (0.377)	-0.060 (0.389)	0.220** (0.001)	0.046 (0.509)	-0.030 (0.667)	0.024 (0.732)	0.158* (0.023)	-0.080 (0.253)	1				
<b>BDSIZE</b>	-0.058 (0.404)	-0.215** (0.002)	-0.251** (0.000)	0.183** (0.008)	0.004 (0.956)	0.142* (0.041)	0.261** (0.000)	0.423** (0.000)	0.143* (0.040)	0.187** (0.007)	-0.033 (0.632)	0.041 (0.555)	-0.049 (0.478)	1			
<b>AUDITOR</b>	0.029 (0.682)	-0.117 (0.094)	-0.164* (0.018)	0.138* (0.047)	-0.106 (0.128)	0.156* (0.025)	0.106 (0.129)	0.183** (0.008)	0.134 (0.053)	0.217** (0.002)	-0.104 (0.134)	0.076 (0.272)	0.068 (0.326)	0.303** (0.000)	1		
<b>LNSIZE</b>	-0.119 (0.088)	-0.275** (0.000)	-0.290** (0.000)	0.197** (0.004)	0.015 (0.833)	0.209** (0.002)	0.378** (0.000)	0.306** (0.000)	0.343** (0.000)	0.265** (0.000)	0.006 (0.929)	0.127 (0.068)	0.099 (0.157)	0.581** (0.000)	0.355** (0.000)	1	
<b>LEV</b>	0.032 (0.650)	0.023 (0.739)	0.056 (0.418)	-0.109 (0.116)	0.014 (0.837)	0.107 (0.123)	0.028 (0.685)	0.122 (0.080)	0.178** (0.010)	-0.056 (0.418)	0.036 (0.607)	0.181** (0.009)	0.089 (0.200)	0.082 (0.240)	0.113 (0.103)	0.364** (0.000)	1

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

EQJones = Cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

EQDD = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

EQDDadj = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

ACIND = Proportion of independent directors on audit committee  
ACACCEXP = Proportion of directors on audit committee with accounting qualifications  
ACLEGEXP = Proportion of directors on audit committee with legal qualifications  
ACMEET = Number of audit committee meetings  
ACSIZE = Number of audit committee members  
ACTENURE = Number of years since formation of audit committee  
BDIND = Proportion of independent directors on the board  
BDACCEXP = Proportion of directors on the board with accounting qualifications  
BDLEGEXP = Proportion of directors on the board with legal qualifications  
BDMEET = Number of board meetings  
BDSIZE = Number of board members  
AUDITOR: 1 = Big 5 or 6 auditor; 0 = Non-big 5 or 6 auditor  
LNSIZE = Natural log of total assets  
LEV = Total liabilities divided by total assets

### 4.5.3 Regression results

This section discusses the results obtained from regressing the three earnings quality variables on the various independent variables. The first regression is based on a modified Jones (1991) model of discretionary accruals and the other two are based on the Dechow and Dichev (2002) accrual estimation error model. As highlighted in tables 4.9 and 4.10, there were significant positive correlations between the audit committee variables and the associated board variables. Therefore, each of the regressions was initially run including the board variables. Then they were run excluding the three most highly correlated board variables (i.e., BDIND, BDACCCEXP and BDLEGEXP). Finally, all board variables were excluded and only the audit committee variables were included in the regressions, along with the other control variables. Furthermore, an analysis of the Mahalanobis distance values for each of the models identified five cases as multivariate outliers. The Mahalanobis distance measures the distance of the values for the independent variables from the average value (Tabachnick and Fidell 1989). A large Mahalanobis distance identifies a case as having extreme values on one or more of the independent variables (SPSS Inc 2004). The five outlier cases were excluded from the sample for the purpose of reporting the regression results.

#### 4.5.3.1 Modified Jones (1991) model

Table 4.11 shows the results from the regression using the earnings quality variable derived from the Jones (1991) model (EQJones): Model 1 included all board variables; Model 2 excluded BDIND, BDACCCEXP and BDLEGEXP; and Model 3 excluded all board variables. Model 1 had an adjusted  $R^2$  of 0.377, an  $F$  statistic of 5.695 and a  $p$ -value of 0.000. ACACCCEXP was significant at the 0.05 level with the predicted sign, however BDACCCEXP was significant at the 0.01 level but with the incorrect sign. This result was likely to be influenced by the significant positive correlation between these two variables. None of the other audit committee or board variables was significant. A similar result was found for Model 2.

Model 3 had an adjusted  $R^2$  of 0.328, an  $F$  statistic of 5.685 and a  $p$ -value of 0.000. The coefficients for ACIND and ACTENURE had the predicted sign, however, these and the other audit committee variables were not significant at the 0.05 or 0.01

levels<sup>7</sup>. Therefore, these results do not support hypotheses 2a, 3a, 4a, 5a or 6. The natural log of total assets (LNSIZE) was significant at the 0.01 level with a negative coefficient. Due to the inverse relation between EQJones and the level of earnings quality, this suggests that larger companies have higher quality earnings. Company size was also significant in Bedard, Chtourou and Courteau (2004), Van der Zahn and Tower (2004), Davidson, Goodwin-Stewart and Kent (2005) and Yang and Krishnan (2005). The insignificance of the audit committee variables could be partly explained by the significant positive correlations between most of them and LNSIZE as indicated by tables 4.9 and 4.10. Furthermore, several of the industry dummy variables were significant, which suggests that earnings quality varies across industries. Similar regression results were obtained when a reciprocal transformed EQJones variable was used.

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<sup>7</sup> EQJones was also split into two subgroups representing companies with income increasing and income decreasing accruals. When regressions were run separately on these two subgroups, none of the audit committee variables were significant.



**Table 4.11 Regression estimates of EQJones on audit committee and control variables for 203 randomly selected ASX listed companies in 2001**  
**unstandardised coefficient (t-statistic)**

<b>Variable</b>	<b>Predicted sign</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Intercept		0.361 (2.671)**	0.323 (2.382)*	0.467 (3.771)**
ACIND	-	-0.076 (-1.578)	-0.044 (-1.386)	-0.043 (1.395)
ACACCEXP	-	-0.116 (-2.015)*	0.004 (0.117)	0.004 (0.115)
ACLEGEXP	-	0.166 (1.947)	0.080 (1.408)	0.064 (1.115)
ACMEET	-	0.008 (0.997)	0.006 (0.762)	0.002 (0.296)
ACSIZE	-	0.003 (0.251)	0.010 (0.924)	0.003 (0.319)
ACTENURE	-	-0.001 (-0.230)	-0.002 (-0.301)	-0.001 (-0.135)
BDIND	-	0.059 (0.381)		
BDACCEXP	-	0.268 (2.857)**		
BDLEGEXP	-	-0.141 (-1.137)		
BDMEET	-	0.002 (0.931)	0.003 (1.088)	
BDSIZE	-	-0.001 (-0.101)	-0.002 (-0.392)	
AUDITOR	-	0.023 (0.801)	0.023 (0.819)	0.034 (1.209)
LNSIZE	?	-0.018 (-2.067)*	-0.015 (-1.669)	-0.021 (-2.720)**
LEV	?	0.088 (2.127)*	0.064 (1.630)	0.076 (1.384)
Capital goods	?	-0.078 (-2.106)*	-0.068 (-1.809)	-0.070 (-1.975)*
Commercial, services and supplies	?	-0.066 (-1.431)	-0.061 (-1.311)	-0.068 (-1.470)
Energy	?	-0.017 (-0.379)	-0.006 (-0.134)	-0.007 (-0.165)
Food, beverage and tobacco	?	-0.061 (-1.701)	-0.070 (-1.913)	-0.069 (-1.972)*
Healthcare equipment and services	?	-0.033 (-0.685)	-0.050 (-1.031)	-0.044 (-0.946)
Hotels, restaurants and leisure	?	-0.035 (-0.713)	-0.053 (-1.067)	-0.058 (-1.217)
Materials	?	-0.046 (-0.845)	-0.037 (-0.745)	-0.012 (-0.356)
Media	?	0.249 (5.962)**	0.232 (5.487)**	0.229 (5.678)**
Pharmaceuticals and biotechnology	?	0.000 (-0.006)	-0.011 (-0.177)	-0.026 (-0.455)
Retailing	?	-0.059 (-1.375)	-0.161 (-1.391)	-0.062 (-1.492)
Software and services	?	0.088	0.099	0.104

		(1.915)	(2.115)	(2.303)*
Technology hardware and equipment	?	-0.078 (-1.263)	-0.076 (-1.196)	-0.109 (-1.662)
Telecommunication services	?	0.389 (6.191)**	0.392 (6.126)**	0.308 (4.615)**
Adjusted R <sup>2</sup>		0.377	0.347	0.328
F statistic		5.695	5.677	5.685
p-value		0.000	0.000	0.000

\* significant at the 0.05 level

\*\* significant at the 0.01 level

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

EQJones = Cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

ACIND = Proportion of independent directors on audit committee

ACACCEXP = Proportion of directors on audit committee with accounting qualifications

ACLEGEXP = Proportion of directors on audit committee with legal qualifications

ACMEET = Number of audit committee meetings

ACSIZE = Number of audit committee members

ACTENURE = Number of years since formation of audit committee

BDIND = Proportion of independent directors on the board

BDACCEXP = Proportion of directors on the board with accounting qualifications

BDLEGEXP = Proportion of directors on the board with legal qualifications

BDMEET = Number of board meetings

BDSIZE = Number of board members

AUDITOR: 1 = Big 5 or 6 auditor; 0 = otherwise

LNSIZE = Natural log of total assets

LEV = Total liabilities divided by total assets

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Pharmaceuticals and biotechnology: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Technology hardware and equipment: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

#### 4.5.3.2 Dechow and Dichev (2002) models

Table 4.12 reports the regression results using the first earnings quality variable derived from Dechow and Dichev (2002) (EQDD) and table 4.13 reports the results for the second Dechow and Dichev (2002) model variable (EQDDadj). As with table 4.11, for both tables, Model 1 included all board variables; Model 2 excluded BDIND, BDACCCEXP and BDLEGEXP; and Model 3 excluded all board variables. In Models 1 and 2 for both EQDD and EQDDadj, none of the audit committee or board variables were significant.

In Model 3 on tables 4.12 and 4.13, when all board variables were excluded, the adjusted  $R^2$ s were 0.067 (EQDD) and 0.074 (EQDDadj). The EQDD model had an  $F$  statistic of 1.688 and a  $p$ -value of 0.036 and the EQDDadj model had an  $F$  statistic of 1.769 with a  $p$ -value of 0.025. The explanatory power of these models was not as high as the EQJones model as indicated in table 4.11. Regarding the independent variables, similar to the EQJones model, none of the audit committee variables were significant but LNSIZE was significant with a negative coefficient. Consequently, there is no multivariate support for hypotheses 2a, 3a, 4a, 5a or 6. Only the Software and services industry variable was significant, indicating lower quality earnings for this industry. Very similar results were obtained when the reciprocal transformed EQDD and EQDDadj variables were used.

**Table 4.12 Regression estimates of EQDD on audit committee and control variables for 203 randomly selected ASX listed companies in 2001**  
unstandardised coefficient (t-statistic)

<b>Variable</b>	<b>Predicted sign</b>	<b>EQDD (Model 1)</b>	<b>EQDD (Model 2)</b>	<b>EQDD (Model 3)</b>
Intercept		0.608 (4.384)**	0.573 (4.208)**	0.413 (3.579)**
ACIND	-	-0.070 (-1.416)	-0.017 (-0.536)	-0.015 (-0.519)
ACACCEXP	-	0.022 (0.379)	-0.016 (-0.434)	0.001 (0.030)
ACLEGEXP	-	0.045 (0.514)	-0.032 (-0.554)	-0.025 (-0.473)
ACMEET	-	0.007 (0.846)	0.007 (0.826)	0.003 (0.392)
ACSIZE	-	-0.006 (-0.559)	-0.005 (-0.459)	-0.001 (-0.120)
ACTENURE	-	0.006 (1.029)	0.006 (1.033)	0.005 (1.099)
BDIND	-	0.091 (1.302)		
BDACCEXP	-	-0.062 (-0.647)		
BDLEGEXP	-	-0.125 (-0.979)		
BDMEET	-	-0.002 (-0.840)	-0.002 (-0.970)	
BDSIZE	-	0.003 (0.513)	0.003 (0.494)	
AUDITOR	-	0.012 (0.406)	0.018 (0.642)	0.042 (1.587)
LNSIZE	?	-0.035 (-3.823)**	-0.032 (-3.645)**	-0.022 (-3.060)**
LEV	?	0.271 (6.394)**	0.255 (6.468)**	0.055 (1.072)
Capital goods	?	-0.064 (-1.690)	-0.061 (-1.614)	-0.035 (-1.058)
Commercial, services and supplies	?	-0.002 (-0.040)	0.002 (0.046)	0.020 (0.461)
Energy	?	-0.004 (-0.079)	-0.003 (-0.063)	-0.007 (-0.172)
Food, beverage and tobacco	?	-0.020 (-0.547)	-0.022 (-0.610)	-0.002 (-0.071)
Healthcare equipment and services	?	0.008 (0.173)	0.002 (0.048)	0.019 (0.449)
Hotels, restaurants and leisure	?	-0.044 (-0.857)	-0.045 (-0.896)	-0.033 (-0.748)
Materials	?	-0.023 (-0.512)	-0.024 (-0.525)	-0.025 (-0.534)
Media	?	-0.045 (-1.055)	-0.053 (-1.249)	-0.023 (-0.625)
Pharmaceuticals and biotechnology	?	0.106 (1.694)	0.102 (1.673)	0.090 (1.679)
Retailing	?	-0.005 (-0.117)	-0.010 (-0.221)	0.011 (0.294)
Software and	?	0.113	0.108	0.114

services		(2.385)*	(2.296)*	(2.720)**
Technology hardware and equipment	?	-0.020 (-0.311)	-0.016 (-0.258)	0.012 (0.190)
Telecommunication services	?	0.008 (0.119)	0.008 (0.124)	0.001 (0.008)
Adjusted R <sup>2</sup>		0.237	0.238	0.067
F statistic		3.408	3.737	1.688
p-value		0.000	0.000	0.036

\* significant at the 0.05 level

\*\* significant at the 0.01 level

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

EQDD = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

EQDDadj = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

ACIND = Proportion of independent directors on audit committee

ACACCEXP = Proportion of directors on audit committee with accounting qualifications

ACLEGEXP = Proportion of directors on audit committee with legal qualifications

ACMEET = Number of audit committee meetings

ACSIZE = Number of audit committee members

ACTENURE = Number of years since formation of audit committee

BDIND = Proportion of independent directors on the board

BDACCEXP = Proportion of directors on the board with accounting qualifications

BDLEGEXP = Proportion of directors on the board with legal qualifications

BDMEET = Number of board meetings

BDSIZE = Number of board members

AUDITOR: 1 = Big 5 or 6 auditor; 0 = otherwise

LNSIZE = Natural log of total assets

LEV = Total liabilities divided by total assets

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Pharmaceuticals and biotechnology: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Technology hardware and equipment: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

**Table 4.13 Regression estimates of EQDDadj on audit committee and control variables for 203 randomly selected ASX listed companies in 2001**  
**unstandardised coefficient (t-statistic)**

<b>Variable</b>	<b>Predicted sign</b>	<b>EQDDadj (Model 1)</b>	<b>EQDDadj (Model 2)</b>	<b>EQDDadj (Model 3)</b>
Intercept		0.595 (4.437)**	0.559 (4.237)**	0.406 (3.641)**
ACIND	-	-0.065 (-1.365)	-0.011 (-0.347)	-0.010 (-0.379)
ACACCEXP	-	0.008 (0.135)	-0.029 (-0.832)	-0.013 (-0.414)
ACLEGEXP	-	0.043 (0.507)	-0.039 (-0.699)	-0.034 (-0.652)
ACMEET	-	0.010 (1.265)	0.010 (1.240)	0.004 (0.580)
ACSIZE	-	-0.013 (-1.146)	-0.011 (-1.044)	-0.009 (-0.908)
ACTENURE	-	0.003 (0.546)	0.003 (0.543)	0.003 (0.598)
BDIND	-	0.093 (1.387)		
BDACCEXP	-	-0.059 (-0.632)		
BDLEGEXP	-	-0.133 (-1.082)		
BDMEET	-	-0.002 (-0.792)	-0.002 (-0.926)	
BDSIZE	-	0.005 (0.823)	0.005 (0.806)	
AUDITOR	-	0.008 (0.298)	0.015 (0.547)	0.040 (1.584)
LNSIZE	?	-0.033 (-3.801)**	-0.031 (-3.595)**	-0.020 (-2.857)**
LEV	?	0.276 (6.749)**	0.260 (6.798)**	0.065 (1.321)
Capital goods	?	-0.053 (-1.440)	-0.050 (-1.349)	-0.027 (-0.859)
Commercial, services and supplies	?	0.000 (-0.008)	0.004 (0.085)	0.019 (0.463)
Energy	?	-0.001 (-0.024)	-0.000 (-0.002)	-0.004 (-0.112)
Food, beverage and tobacco	?	-0.042 (-1.171)	-0.044 (-1.243)	-0.026 (-0.831)
Healthcare equipment and services	?	-0.005 (-0.100)	-0.012 (-0.247)	0.004 (0.106)
Hotels, restaurants and leisure	?	-0.037 (-0.748)	-0.039 (-0.796)	-0.029 (-0.681)
Materials	?	-0.026 (-0.587)	-0.027 (-0.598)	-0.022 (-0.417)
Media	?	-0.044 (-1.065)	-0.052 (-1.278)	-0.025 (-0.683)
Pharmaceuticals and biotechnology	?	0.077 (1.267)	0.072 (1.221)	0.059 (1.145)
Retailing	?	-0.000 (-0.002)	-0.005 (-0.112)	0.016 (0.423)
Software and	?	0.118	0.114	0.119

services		(2.589)**	(2.496)*	(2.952)**
Technology hardware and equipment	?	-0.018 (0.289)	-0.014 (-0.233)	-0.002 (-0.033)
Telecommunication services	?	0.031 (0.459)	0.031 (0.498)	0.002 (0.026)
Adjusted R <sup>2</sup>		0.253	0.253	0.074
F statistic		3.636	3.973	1.769
p-value		0.000	0.000	0.025

\* significant at the 0.05 level

\*\* significant at the 0.01 level

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

EQDD = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

EQDDadj = Cross sectional earnings quality proxy from Dechow and Dichev (2002) model adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

ACIND = Proportion of independent directors on audit committee

ACACCEXP = Proportion of directors on audit committee with accounting qualifications

ACLEGEXP = Proportion of directors on audit committee with legal qualifications

ACMEET = Number of audit committee meetings

ACSIZE = Number of audit committee members

ACTENURE = Number of years since formation of audit committee

BDIND = Proportion of independent directors on the board

BDACCEXP = Proportion of directors on the board with accounting qualifications

BDLEGEXP = Proportion of directors on the board with legal qualifications

BDMEET = Number of board meetings

BDSIZE = Number of board members

AUDITOR: 1 = Big 5 or 6 auditor; 0 = otherwise

LNSIZE = Natural log of total assets

LEV = Total liabilities divided by total assets

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Pharmaceuticals and biotechnology: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Technology hardware and equipment: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

#### 4.5.4 Additional analysis

Several alternative measures for the audit committee variables were used. First, for each of the variables, a dichotomous measure was calculated. An independence dummy variable (ACIND\_DUMMY) was measured as 1 if 50% or greater of the audit committee members were independent and 0 otherwise. Similar alternative measures were also used in several prior studies (Klein 2002a; Bedard, Chtourou and Courteau 2004; Davidson, Goodwin-Stewart and Kent 2005). Two expertise dummy variables (ACACCEXP\_DUMMY and ACLEGEXP\_DUMMY) were measured as 1 if at least one audit committee member had professional accounting or legal qualifications and 0 otherwise. Prior studies such as Bedard, Chtourou and Courteau (2004), Choi, Jeon and Park (2004), Van der Zahn and Tower (2004), Yang and Krishnan (2005), Dhaliwal, Naiker and Navissi (2006) and Rahman and Ali (2006) used similar alternative measures. An alternative activity variable (ACMEET\_DUMMY) was measured as 1 if there were at least three audit committee meetings held during the year and 0 otherwise. Prior studies that used a similar measure were Choi, Jeon and Park (2004) and Dhaliwal, Naiker and Navissi (2006). An alternative size variable (ACSIZE\_DUMMY) was measured as 1 if there were at least three members on the audit committee and 0 otherwise. Bedard, Chtourou and Courteau (2004), Choi, Jeon and Park (2004) and Dhaliwal, Naiker and Navissi (2006) used a similar alternative measure. For the tenure of the audit committee, an alternative variable (ACTENURE\_DUMMY) was measured as 1 if there were 6 or more years between the year after audit committee formation and 2001, and 0 otherwise. Six years was chosen as the cut-off as it was the median for this variable.

The significance of these dummy variables was initially tested using a parametric t-test and a non-parametric Mann-Whitney test. Several of these variables (ACIND\_DUMMY, ACSIZE\_DUMMY and ACTENURE\_DUMMY) were significant in relation to one or more of the earnings quality variables (i.e., EQJones, EQDD and EQDDadj). However, when the dummy variables were substituted for the continuous audit committee variables in the regression models, none of them were significant. This supports the results for the audit committee variables reported in section 4.5.3.

Second, similar to Dhaliwal, Naiker and Navissi (2006), a summary measure of the overall strength of the sample companies' audit committees was calculated.



This variable (AC\_GOV\_SCORE) was calculated as the sum of each of the audit committee dummy variables discussed above (i.e., ACIND\_DUMMY, ACACCEXP\_DUMMY, ACLEGEXP\_DUMMY, ACMEET\_DUMMY, ACSIZE\_DUMMY, and ACTENURE\_DUMMY). Furthermore, a dichotomous variable (AC\_GOV\_SCORE\_DUMMY) was calculated as 1 if the AC\_GOV\_SCORE was 4 or greater and 0 otherwise. There were significant negative correlations between AC\_GOV\_SCORE and the two earnings quality variables derived from the Dechow and Dichev (2002) model (i.e., EQDD and EQDDadj). However, when AC\_GOV\_SCORE was substituted for each of the audit committee variables in the regression models, it was not found to be significant. A similar result was found when AC\_GOV\_SCORE\_DUMMY was used.

Finally, a number of additional variables were calculated to test the interaction between several of the audit committee variables. These variables measured the interactions between: independence (ACIND) and accounting expertise (ACACCEXP); independence (ACIND) and legal expertise (ACLEGEXP); accounting expertise (ACACCEXP) and legal expertise (ACLEGEXP); independence (ACIND) and activity (ACMEET); and accounting expertise (ACACCEXP) and activity (ACMEET). Each of these interaction variables were included separately in the regression models with all of the other variables. None of the interaction variables were found to be significantly associated with the earnings quality measures.

## **4.6 Changes in audit committee characteristics and financial reporting quality**

### **4.6.1 Descriptive statistics**

Table 4.14 shows the descriptive statistics for the variables used in the models analysing the association between changes in audit committee characteristics and changes in financial reporting quality. The change variables were calculated as the difference between the variables in the year after audit committee formation and 2001. Panel A provides the descriptive statistics for changes in each of the continuous variables, while Panel B reports details of changes in the auditor variable.

Panel A indicates that changes in each of the 3 dependent variables, i.e.,  $\Delta EQ_{Jones}$ ,  $\Delta EQ_{DD}$  and  $\Delta EQ_{DDadj}$ , had relatively high values for skewness and kurtosis. This suggested that these variables were not normally distributed. First,

natural log and reciprocal variable transformations were used to attempt to improve the distribution of these variables. However, the skewness and kurtosis statistics were higher for these transformed variables compared to the untransformed variables. Therefore, the untransformed variables were used in the regression models. Boxplots of these variables were examined to determine the existence of univariate outliers. Consequently, two outliers were identified for  $\Delta EQJones$  and one outlier was identified for  $\Delta EQDD$  and  $\Delta EQDDadj$ . After these outliers were excluded, the skewness and kurtosis statistics for  $\Delta EQJones$  were -1.404 and 5.949. The skewness and kurtosis statistics for  $\Delta EQDD$  were -0.262 and 1.669 and for  $\Delta EQDDadj$  the statistics were -1.170 and 5.015. The regression models in section 4.6.3 were run without these outliers.

For the changes in the audit committee variables, Panel A shows that there was a change in the proportion of independent audit committee members of between -1 and 1, with an average of 0.0625. This indicates that, between the year after formation and 2001, some audit committees went from having no independent members to have all independent members and vice versa. The change in the proportion of members with accounting expertise was between -1 and 0.6667, with an average of 0.0113. The change in the proportion of members with legal expertise ranged from -0.6667 to 0.6667 and the average was -0.008. There was a change in the number of audit committee meetings of between -7 and 4, with an average of 0.17. The change in the size of the audit committees ranged from -4 to 4 and the average was 0.07.

The control variables used were changes in several board variables, company size, leverage and auditor. Panel A shows that, on average, the boards of the sample companies had: a 0.067 change in the proportion of members who were independent; a 0.021 change in the proportion of members with accounting expertise and a -0.008 change in the proportion of members with legal expertise. The average change in the number of board meetings was -0.76 and the average change in board size was -0.04. Due to the very high skewness and kurtosis statistics for the change in company size, this variable was transformed by a natural log transformation. The skewness and kurtosis statistics were reduced to 2.539 and 13.683 respectively. The average change in leverage was 0.032. Panel B shows that only 26 (19.1%) of companies in the sample changed from a non-Big 5/6 auditor to a Big 5/6 auditor. The remainder had no change in their auditor between the year after audit committee formation and 2001.

**Table 4.14 Descriptive statistics for 136 ASX listed companies for changes in earnings quality variables and changes in audit committee and control variables**

<b>Panel A Continuous variables</b>						
<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
ΔEQJones	-3.64900	1.1213	-0.13753	0.524681	-3.663	20.195
ΔEQDD	-0.73721	0.3646	-0.01661	0.142157	-1.078	5.139
ΔEQDDadj	-0.73994	0.3953	-0.01510	0.154777	-1.582	6.229
ΔACIND	-1	1	0.06257	0.340612	0.039	1.133
ΔACACCEXP	-1	0.6667	0.01132	0.275345	-0.434	1.641
ΔACLEGEXP	-0.66667	0.6667	-0.00803	0.179807	-0.183	3.171
ΔACMEET	-7	4	0.17	1.473	-0.678	3.867
ΔACSIZE	-4	4	0.07	0.994	-0.011	3.783
ΔBDIND	-0.55	0.80	0.06770	0.241330	0.519	0.708
ΔBDACCEXP	-0.33333	0.50	0.02156	0.155955	0.378	0.118
ΔBDLEGEXP	-0.40	0.40	-0.00870	0.114493	0.076	2.302
ΔBDMEET	-24	26	-0.76	5.518	0.275	5.994
ΔBDSIZE	-9	6	-0.04	1.966	-0.953	5.156
ΔLEV	-0.59764	0.6761	0.03240	0.182649	0.222	2.316
LNΔSIZE	18.37	24.79	20.551	0.65054	2.539	13.683
<b>Panel B Dichotomous variables</b>						
<b>Variable</b>	<b>Frequency of 1s</b>		<b>Frequency of 0s</b>			
ΔAUDITOR	26		110			

ΔEQJones = Change in cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

ΔEQDD = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

ΔEQDDadj = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

ΔACIND = Change in proportion of independent directors on the audit committee

ΔACACCEXP = Change in proportion of directors on the audit committee with accounting qualifications

ΔACLEGEXP = Change in proportion of directors on the audit committee with legal qualifications

ΔACMEET = Change in number of audit committee meetings

ΔACSIZE = Change in number of audit committee members

ΔBDIND = Change in proportion of independent directors on the board

ΔBDACCEXP = Change in proportion of directors on the board with accounting qualifications

ΔBDLEGEXP = Change in proportion of directors on the board with legal qualifications

ΔBDMEET = Change in number of board meetings

ΔBDSIZE = Change in number of board members

ΔLEV = Change in leverage (as measured by total liabilities divided by total assets)

LNΔSIZE = Natural log of change in company size (as measured by total assets)

ΔAUDITOR: 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise

#### 4.6.2 Correlations

Table 4.15 shows the Pearson correlation coefficients between all combinations of dependent and independent variables. As expected, the two dependent variables based on the Dechow and Dichev (2002) model ( $\Delta EQDD$  and  $\Delta EQDDadj$ ) were significantly positively correlated with each other with a coefficient of 0.861. However,  $\Delta EQDD$  and  $\Delta EQDDadj$  were not significantly correlated with the Jones (1991) model variable ( $\Delta EQJones$ ).  $\Delta EQDD$  was significantly positively correlated with the change in the number of board meetings ( $\Delta BDMEET$ ). This result suggests that companies with increased numbers of board meetings are associated with lower quality earnings. None of the audit committee variables were significantly correlated with any of the earnings quality variables.

Table 4.15 also shows that several significant correlations existed between the various independent variables. The following associated audit committee and board variables were significantly positively correlated:  $\Delta ACIND$  and  $\Delta BDIND$ ;  $\Delta ACACCEXP$  and  $\Delta BDACCEXP$ ;  $\Delta ACLEGEXP$  and  $\Delta BDLEGEXP$ ; and  $\Delta ACSIZE$  and  $BDSIZE$ . These results were not surprising considering that the audit committee members are drawn from the board of directors. Similar significant correlations were found in table 4.9 between the same variables for 2001. As with the cross sectional regressions in section 4.5.3, due to potential problems with multicollinearity, the change in the board variables were not included in the regression models with the changes in the audit committee variables. Other significant correlations were between:  $\Delta ACACCEXP$  and  $\Delta ACLEGEXP$  (negative);  $\Delta ACACCEXP$  and  $\Delta ACSIZE$  (negative); and  $\Delta BDMEET$  and  $\Delta LEV$  (positive).

Non-parametric Spearman correlations were also calculated due to possible violations of the normal distribution assumption for some of the variables, as indicated by the skewness and kurtosis statistics in table 4.14. Table 4.16 reports the Spearman correlation coefficients. Similar to the Pearson correlations in table 4.15,  $\Delta EQDD$  and  $\Delta EQDDadj$  were significantly positively correlated with each other, but not with  $\Delta EQJones$ . The change in the Jones (1991) model variable ( $\Delta EQJones$ ) was significantly positively correlated with  $\Delta ACACCEXP$  and significantly negatively correlated with  $\Delta BDMEET$ . Therefore, there are some differences between the Pearson and Spearman correlations for the changes in the independent variables and

the changes in the earnings quality variables. This may be due to the higher values for skewness and kurtosis shown in table 4.14.

Table 4.16 also highlights some significant correlations between the independent variables. As with the Pearson correlations,  $\Delta ACIND$  and  $\Delta BDIND$ ;  $\Delta ACACCEXP$  and  $\Delta BDACCEXP$ ;  $\Delta ACLEGEXP$  and  $\Delta BDLEGEXP$ ; and  $\Delta ACSIZE$  and  $BDSIZE$  were significantly positively correlated. The only other significant correlation was between  $\Delta ACLEGEXP$  and  $\Delta BDIND$  (negative).

**Table 4.15 Pearson correlations for 136 ASX listed companies for changes in earnings quality variables and changes in audit committee and control variables**

	ΔEQJones	ΔEQDD	ΔEQDDadj	ΔACIND	ΔACACCEXP	ΔACLEGEXP	ΔACMEET	ΔACSIZE	ΔBDIND	ΔBDACCEXP	ΔBDLEGEXP	ΔBDMEET	ΔBDSIZE	ΔAUDITOR	ΔLEV	LNASIZE
ΔEQJones	1															
ΔEQDD	0.069 (0.427)	1														
ΔEQDDadj	0.045 (0.599)	0.861** (0.000)	1													
ΔACIND	-0.115 (0.182)	-0.077 (0.371)	-0.097 (0.260)	1												
ΔACACCEXP	0.063 (0.465)	0.002 (0.980)	-0.061 (0.480)	-0.009 (0.916)	1											
ΔACLEGEXP	0.076 (0.380)	0.032 (0.709)	0.145 (0.092)	0.063 (0.463)	-0.217* (0.011)	1										
ΔACMEET	-0.006 (0.945)	0.004 (0.962)	0.039 (0.656)	0.057 (0.511)	-0.049 (0.569)	-0.013 (0.878)	1									
ΔACSIZE	0.014 (0.871)	0.023 (0.790)	0.019 (0.823)	-0.090 (0.297)	-0.179* (0.037)	0.124 (0.150)	0.052 (0.546)	1								
ΔBDIND	-0.150 (0.082)	-0.143 (0.097)	-0.155 (0.071)	0.728** (0.000)	0.049 (0.575)	-0.141 (0.101)	0.029 (0.737)	-0.021 (0.804)	1							
ΔBDACCEXP	0.058 (0.499)	-0.007 (0.936)	-0.017 (0.846)	-0.036 (0.680)	0.680** (0.000)	0.041 (0.635)	0.007 (0.936)	0.070 (0.417)	-0.057 (0.508)	1						
ΔBDLEGEXP	0.025 (0.776)	0.000 (1.000)	0.053 (0.543)	-0.079 (0.362)	-0.053 (0.541)	0.472** (0.000)	0.018 (0.837)	-0.010 (0.910)	-0.144 (0.094)	-0.050 (0.565)	1					
ΔBDMEET	-0.052 (0.549)	0.197* (0.021)	0.109 (0.207)	0.107 (0.216)	0.020 (0.815)	0.028 (0.747)	0.116 (0.178)	-0.013 (0.883)	0.041 (0.637)	0.034 (0.692)	-0.120 (0.163)	1				
ΔBDSIZE	0.016 (0.858)	0.000 (1.000)	0.045 (0.606)	0.065 (0.449)	0.017 (0.841)	0.076 (0.379)	-0.008 (0.930)	0.248** (0.004)	0.096 (0.269)	0.066 (0.447)	-0.030 (0.733)	-0.054 (0.530)	1			
ΔAUDITOR	0.046 (0.598)	-0.044 (0.609)	-0.028 (0.743)	-0.030 (0.731)	0.028 (0.749)	-0.063 (0.464)	-0.052 (0.550)	0.008 (0.931)	0.029 (0.738)	-0.035 (0.682)	0.085 (0.325)	0.085 (0.326)	-0.123 (0.153)	1		
ΔLEV	0.125 (0.148)	0.131 (0.130)	0.089 (0.301)	-0.001 (0.994)	-0.101 (0.241)	-0.059 (0.496)	0.076 (0.378)	-0.137 (0.111)	0.066 (0.448)	-0.085 (0.323)	-0.106 (0.222)	0.189* (0.027)	0.042 (0.627)	-0.089 (0.301)	1	
LNASIZE	-0.108 (0.209)	-0.057 (0.510)	0.002 (0.980)	0.071 (0.414)	-0.043 (0.617)	0.086 (0.319)	0.122 (0.156)	-0.008 (0.929)	0.043 (0.623)	-0.045 (0.601)	0.049 (0.569)	0.070 (0.421)	0.057 (0.507)	-0.041 (0.635)	0.020 (0.818)	1

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

ΔEQJones = Change in cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

ΔEQDD = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

ΔEQDDadj = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

$\Delta ACIND$  = Change in proportion of independent directors on the audit committee  
 $\Delta ACACCEXP$  = Change in proportion of directors on the audit committee with accounting qualifications  
 $\Delta ACLEGEXP$  = Change in proportion of directors on the audit committee with legal qualifications  
 $\Delta ACMEET$  = Change in number of audit committee meetings  
 $\Delta ACSIZE$  = Change in number of audit committee members  
 $\Delta BDIND$  = Change in proportion of independent directors on the board  
 $\Delta BDACCEXP$  = Change in proportion of directors on the board with accounting qualifications  
 $\Delta BDLEGEXP$  = Change in proportion of directors on the board with legal qualifications  
 $\Delta BDMEET$  = Change in number of board meetings  
 $\Delta BDSIZE$  = Change in number of board members  
 $\Delta AUDITOR$ : 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise  
 $\Delta LEV$  = Change in leverage (as measured by total liabilities divided by total assets)  
 $LN\Delta SIZE$  = Natural log of change in company size (as measured by total assets)

**Table 4.16 Spearman correlations for 136 ASX listed companies for changes in earnings quality variables and changes in audit committee and control variables**

	$\Delta EQ_{Jones}$	$\Delta EQ_{DD}$	$\Delta EQ_{DDadj}$	$\Delta ACIND$	$\Delta ACACCEXP$	$\Delta ACLEGEXP$	$\Delta ACMEET$	$\Delta ACSIZE$	$\Delta BDIND$	$\Delta BDACCEXP$	$\Delta BDLEGEXP$	$\Delta BDMEET$	$\Delta BDSIZE$	$\Delta AUDITOR$	$\Delta LEV$	$LNASIZE$
$\Delta EQ_{Jones}$	1															
$\Delta EQ_{DD}$	-0.001 (0.989)	1														
$\Delta EQ_{DDadj}$	-0.078 (0.368)	0.754** (0.000)	1													
$\Delta ACIND$	-0.035 (0.689)	-0.015 (0.855)	-0.069 (0.427)	1												
$\Delta ACACCEXP$	0.196* (0.022)	-0.006 (0.942)	-0.043 (0.619)	0.023 (0.791)	1											
$\Delta ACLEGEXP$	-0.093 (0.280)	-0.018 (0.835)	0.072 (0.404)	-0.016 (0.852)	-0.149 (0.083)	1										
$\Delta ACMEET$	-0.158 (0.067)	0.034 (0.696)	0.089 (0.301)	0.072 (0.406)	-0.048 (0.581)	-0.080 (0.354)	1									
$\Delta ACSIZE$	0.139 (0.106)	-0.079 (0.359)	-0.030 (0.728)	-0.138 (0.108)	-0.157 (0.068)	0.064 (0.460)	0.081 (0.347)	1								
$\Delta BDIND$	-0.022 (0.797)	-0.088 (0.310)	-0.125 (0.148)	0.647** (0.000)	0.108 (0.212)	-0.169* (0.049)	0.047 (0.587)	0.034 (0.692)	1							
$\Delta BDACCEXP$	0.159 (0.064)	-0.041 (0.632)	-0.029 (0.737)	-0.032 (0.708)	0.683** (0.000)	0.047 (0.585)	-0.039 (0.650)	0.079 (0.362)	-0.021 (0.807)	1						
$\Delta BDLEGEXP$	-0.055 (0.524)	-0.032 (0.715)	0.032 (0.711)	-0.049 (0.571)	-0.096 (0.268)	0.455** (0.000)	-0.053 (0.537)	0.003 (0.974)	-0.113 (0.190)	-0.024 (0.780)	1					
$\Delta BDMEET$	-0.216* (0.012)	0.143 (0.098)	0.068 (0.432)	0.097 (0.262)	-0.038 (0.663)	0.019 (0.829)	0.151 (0.079)	-0.028 (0.744)	0.072 (0.403)	-0.033 (0.702)	-0.136 (0.115)	1				
$\Delta BDSIZE$	0.091 (0.292)	-0.029 (0.734)	0.023 (0.792)	0.069 (0.425)	0.052 (0.548)	0.063 (0.465)	-0.032 (0.713)	0.289** (0.001)	0.083 (0.337)	0.152 (0.077)	-0.041 (0.635)	0.015 (0.862)	1			
$\Delta AUDITOR$	0.013 (0.881)	-0.120 (0.165)	-0.079 (0.361)	0.016 (0.852)	0.030 (0.727)	-0.076 (0.379)	-0.011 (0.901)	0.036 (0.673)	0.073 (0.398)	-0.036 (0.675)	0.126 (0.144)	0.084 (0.334)	-0.143 (0.097)	1		
$\Delta LEV$	0.048 (0.577)	0.080 (0.354)	0.040 (0.643)	0.045 (0.599)	-0.108 (0.210)	-0.024 (0.783)	0.087 (0.311)	-0.074 (0.391)	0.049 (0.569)	-0.099 (0.251)	-0.053 (0.543)	0.158 (0.066)	-0.058 (0.506)	-0.039 (0.648)	1	
$LNASIZE$	-0.147 (0.089)	-0.145 (0.093)	-0.044 (0.609)	0.163 (0.058)	-0.008 (0.924)	0.115 (0.181)	0.065 (0.455)	-0.024 (0.785)	0.110 (0.203)	-0.043 (0.620)	0.127 (0.140)	0.087 (0.315)	0.019 (0.825)	0.042 (0.625)	0.137 (0.110)	1

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

$\Delta EQ_{Jones}$  = Change in cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

$\Delta EQ_{DD}$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

$\Delta EQ_{DDadj}$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)



$\Delta ACIND$  = Change in proportion of independent directors on the audit committee  
 $\Delta ACACCEXP$  = Change in proportion of directors on the audit committee with accounting qualifications  
 $\Delta ACLEGEXP$  = Change in proportion of directors on the audit committee with legal qualifications  
 $\Delta ACMEET$  = Change in number of audit committee meetings  
 $\Delta ACSIZE$  = Change in number of audit committee members  
 $\Delta BDIND$  = Change in proportion of independent directors on the board  
 $\Delta BDACCEXP$  = Change in proportion of directors on the board with accounting qualifications  
 $\Delta BDLEGEXP$  = Change in proportion of directors on the board with legal qualifications  
 $\Delta BDMEET$  = Change in number of board meetings  
 $\Delta BDSIZE$  = Change in number of board members  
 $\Delta AUDITOR$ : 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise  
 $\Delta LEV$  = Change in leverage (as measured by total liabilities divided by total assets)  
 $LN\Delta SIZE$  = Natural log of change in company size (as measured by total assets)

### 4.6.3 Regression results

This section describes the results obtained from regressing the changes in the three earnings quality variables on the changes in the various independent variables. Tables 4.15 and 4.16 showed that there were significant positive correlations between the audit committee variables and the associated board variables. Therefore, each of the regressions was initially run including the board variables. Then they were run excluding the three most highly correlated board variables (i.e.,  $\Delta BDIND$ ,  $\Delta BDACC$  and  $\Delta BDLEG$ ). Finally, all board variables were excluded from the regressions to avoid problems with multicollinearity.

The regression models in this section were run without the two univariate outliers for  $\Delta EQJones$  and the one univariate outlier for  $\Delta EQDD$  and  $\Delta EQDDadj$ . An examination of the Mahalanobis distance values for each of the sample companies identified eight multivariate outliers. Therefore, these eight companies were also excluded from the results reported in tables 4.17, 4.18 and 4.19. For  $\Delta EQJones$ , one of the multivariate outliers was also a univariate outlier. Therefore, a total of nine outliers were excluded from the results reported for each of the dependent variables.

#### 4.6.3.1 Modified Jones (1991) model

The results from the regression model for  $\Delta EQJones$  are shown in table 4.17: Model 1 included the change in all board variables; Model 2 excluded the change in  $\Delta BDIND$ ,  $\Delta BDACC$  and  $\Delta BDLEG$ ; and Model 3 excluded the change in all board variables. In both Models 1 and 2, none of the audit committee or board variables were significant.

After excluding all board variables, Model 3 had an adjusted  $R^2$  of 0.180 with an  $F$  statistic of 2.106 with a  $p$ -value of 0.005. While the coefficients for  $\Delta ACACC$ ,  $\Delta ACLEG$  and  $\Delta ACMEET$  had the predicted sign, none of the audit committee variables were significant at the 0.05 or 0.01 levels. Therefore, there is no support for hypotheses 2b, 3b, 4b or 5b. Similarly, none of the year dummy variables were significant. The only significant variables were several of the industry control variables.

**Table 4.17 Regression estimates of  $\Delta EQJones$  on changes in audit committee and control variables for 127 ASX listed companies  
unstandardised coefficient (t-statistic)**

Variable	Predicted sign	Model 1	Model 2	Model 3
Intercept		1.316 (1.080)	1.397 (1.171)	1.398 (1.189)
$\Delta ACIND$	-	0.021 (0.145)	0.040 (0.424)	0.024 (0.255)
$\Delta ACACCEXP$	-	0.034 (0.193)	-0.001 (-0.006)	-0.014 (-0.115)
$\Delta ACLEGEXP$	-	-0.013 (-0.055)	-0.143 (-0.752)	-0.166 (-0.868)
$\Delta ACMEET$	-	-0.009 (-0.420)	-0.012 (-0.575)	-0.015 (-0.716)
$\Delta ACSIZE$	-	0.006 (0.180)	0.008 (0.247)	0.008 (0.254)
$\Delta BDIND$	-	0.011 (0.052)		
$\Delta BDACCEXP$	-	-0.086 (-0.280)		
$\Delta BDLEGEXP$	-	-0.338 (-1.077)		
$\Delta BDMEET$	-	-0.010 (-1.777)	-0.009 (-1.691)	
$\Delta BDSIZE$	-	-0.003 (-0.158)	-0.001 (-0.070)	
$\Delta AUDITOR$	-	0.159 (1.161)	0.150 (1.108)	0.116 (0.865)
$LN\Delta SIZE$	?	-0.082 (-1.450)	-0.086 (-1.539)	-0.086 (-1.563)
$\Delta LEV$	?	-0.015 (-0.080)	-0.003 (-0.017)	-0.064 (-0.368)
AC1993	?	0.180 (0.876)	0.185 (0.896)	0.179 (0.865)
AC1994	?	0.227 (1.296)	0.223 (1.316)	0.207 (1.237)
AC1995	?	0.110 (0.880)	0.092 (0.804)	0.090 (0.780)
AC1996	?	0.170 (1.335)	0.159 (1.325)	0.159 (1.323)
AC1997	?	0.004 (0.030)	-0.008 (-0.066)	0.030 (0.242)
AC1998	?	0.151 (1.054)	0.145 (1.086)	0.153 (1.154)
AC1999	?	0.007 (0.053)	-0.003 (-0.025)	-0.013 (-0.102)
AC2000	?	0.075 (0.514)	0.074 (0.518)	0.085 (0.608)
Capital goods	?	0.314 (2.709)**	0.301 (2.654)**	0.301 (2.694)**
Commercial, services and supplies	?	0.138 (0.950)	0.134 (0.940)	0.140 (0.984)
Energy	?	0.111 (0.934)	0.127 (1.092)	0.143 (1.236)
Food, beverage and tobacco	?	0.159 (1.422)	0.178 (1.623)	0.193 (1.761)

Healthcare equipment and services	?	0.233 (1.676)	0.225 (1.654)	0.252 (1.873)
Hotels, restaurants and leisure	?	0.231 (1.462)	0.212 (1.366)	0.250 (1.640)
Materials	?	0.300 (0.412)	0.315 (0.456)	0.250 (0.379)
Media	?	0.603 (5.090)**	0.591 (5.230)**	0.599 (5.284)**
Retailing	?	0.266 (1.974)	0.279 (2.158)*	0.283 (2.192)*
Software and services	?	0.304 (2.431)*	0.297 (2.459)*	0.318 (2.593)*
Telecommunication services	?	-0.301 (-1.372)	-0.300 (-1.401)	-0.295 (-1.383)
Adjusted R <sup>2</sup>		0.172	0.187	0.180
F statistic		1.871	2.074	2.106
p-value		0.012	0.005	0.005

\* significant at the 0.05 level

\*\* significant at the 0.01 level

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

$\Delta EQ_{Jones}$  = Change in cross sectional earnings quality proxy from modified Jones (1991) model (i.e., absolute value of abnormal accruals)

$\Delta ACIND$  = Change in proportion of independent directors on the audit committee

$\Delta ACACCEXP$  = Change in proportion of directors on the audit committee with accounting qualifications

$\Delta ACLEGEXP$  = Change in proportion of directors on the audit committee with legal qualifications

$\Delta ACMEET$  = Change in number of audit committee meetings

$\Delta ACSIZE$  = Change in number of audit committee members

$\Delta BDIND$  = Change in proportion of independent directors on the board

$\Delta BDACCEXP$  = Change in proportion of directors on the board with accounting qualifications

$\Delta BDLEGEXP$  = Change in proportion of directors on the board with legal qualifications

$\Delta BDMEET$  = Change in number of board meetings

$\Delta BDSIZE$  = Change in number of board members

$\Delta AUDITOR$ : 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise

$LN\Delta SIZE$  = Natural log of change in company size (as measured by total assets)

$\Delta LEV$  = Change in leverage (as measured by total liabilities divided by total assets)

AC1993: 1 = year after formation is 1993; 0 = otherwise

AC1994: 1 = year after formation is 1994; 0 = otherwise

AC1995: 1 = year after formation is 1995; 0 = otherwise

AC1996: 1 = year after formation is 1996; 0 = otherwise

AC1997: 1 = year after formation is 1997; 0 = otherwise

AC1998: 1 = year after formation is 1998; 0 = otherwise

AC1999: 1 = year after formation is 1999; 0 = otherwise

AC2000: 1 = year after formation is 2000; 0 = otherwise

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

#### 4.6.3.2 Dechow and Dichev (2002) models

Tables 4.18 and 4.19 provide the results obtained from the regressions using the two earnings quality variables derived from the Dechow and Dichev (2002) model ( $\Delta EQDD$  and  $\Delta EQDDadj$ ). As with table 4.17, for both tables: Model 1 included the change in all board variables; Model 2 excluded the change in  $BDIND$ ,  $BDACCEXP$  and  $BDLEGEXP$ ; and Model 3 excluded the change in all board variables. None of the audit committee variables were significant in Models 1 or 2.

When the changes in all variables were excluded, the model 3s in tables 4.18 and 4.19 had adjusted  $R^2$ s of -0.112 ( $\Delta EQDD$ ) and 0.012 ( $\Delta EQDDadj$ ). The  $\Delta EQDD$  model had an  $F$  statistic of 0.494 with a  $p$ -value of 0.977 and the  $\Delta EQDDadj$  model had an  $F$  statistic of 1.059 with a  $p$ -value of 0.403. For the independent variables, similar to the  $\Delta EQJones$  model, none of the audit committee variables were significant. These results do not provide support for hypotheses 2b, 3b, 4b or 5b. The only independent variables that were significant were  $AC1999$  and the Software and services industry variable in the  $\Delta EQDDadj$  model.

**Table 4.18 Regression estimates of  $\Delta EQDD$  on changes in audit committee and control variables for 127 ASX listed companies  
unstandardised coefficient (t-statistic)**

<b>Variable</b>	<b>Predicted sign</b>	<b><math>\Delta EQDD</math> (Model 1)</b>	<b><math>\Delta EQDD</math> (Model 2)</b>	<b><math>\Delta EQDD</math> (Model 3)</b>
Intercept		0.524 (0.935)	0.436 (0.795)	0.315 (0.653)
$\Delta ACIND$	-	0.024 (0.366)	-0.028 (-0.659)	-0.022 (-0.578)
$\Delta ACACCEXP$	-	0.013 (0.169)	0.006 (0.117)	0.014 (0.277)
$\Delta ACLEGEXP$	-	-0.030 (-0.274)	0.022 (0.248)	0.022 (0.280)
$\Delta ACMEET$	-	-0.003 (-0.249)	-0.001 (-0.150)	-0.004 (-0.469)
$\Delta ACSIZE$	-	0.003 (0.192)	0.001 (0.052)	0.000 (0.030)
$\Delta BDIND$	-	-0.097 (-0.986)		
$\Delta BDACCEXP$	-	0.008 (0.057)		
$\Delta BDLEGEXP$	-	0.078 (0.541)		
$\Delta BDMEET$	-	0.005 (1.934)	0.005 (2.095)*	
$\Delta BDSIZE$	-	0.003 (0.333)	0.001 (0.152)	
$\Delta AUDITOR$	-	-0.042 (-0.665)	-0.044 (-0.710)	-0.042 (-0.767)
$LN\Delta SIZE$	?	-0.025 (-0.947)	-0.021 (-0.827)	-0.015 (-0.678)
$\Delta LEV$	?	0.054 (0.644)	0.039 (0.475)	0.072 (1.004)
AC1993	?	0.030 (0.389)	0.035 (0.412)	0.025 (0.354)
AC1994	?	-0.003 (-0.039)	0.003 (0.034)	0.019 (0.277)
AC1995	?	-0.010 (-0.181)	0.006 (0.105)	0.010 (0.204)
AC1996	?	-0.038 (-0.640)	-0.023 (-0.415)	-0.039 (-0.787)
AC1997	?	-0.028 (-0.461)	-0.018 (-0.313)	-0.033 (-0.662)
AC1998	?	-0.032 (-0.480)	-0.013 (-0.207)	-0.016 (-0.299)
AC1999	?	-0.053 (-0.868)	-0.050 (-0.857)	-0.055 (-1.042)
AC2000	?	-0.096 (-1.419)	-0.087 (-1.333)	-0.024 (-0.400)
Capital goods	?	0.006 (0.114)	0.010 (0.198)	0.019 (0.407)
Commercial, services and supplies	?	0.011 (0.167)	0.005 (0.083)	0.016 (0.278)
Energy	?	0.037 (0.674)	0.037 (0.703)	0.024 (0.518)
Food, beverage and tobacco	?	0.020 (0.390)	0.015 (0.299)	0.012 (0.267)
Healthcare	?	-0.034	-0.024	0.064

equipment and services		(-0.530)	(-0.377)	(1.099)
Hotels, restaurants and leisure	?	-0.039 (-0.541)	-0.032 (-0.450)	-0.044 (-0.710)
Materials	?	0.056 (0.578)	0.065 (0.645)	0.047 (0.546)
Media	?	-0.029 (-0.533)	-0.013 (-0.254)	-0.034 (-0.727)
Retailing	?	0.057 (0.926)	0.062 (1.038)	0.060 (1.139)
Software and services	?	0.090 (1.565)	0.099 (1.748)	0.074 (1.466)
Telecommunication services	?	0.066 (0.657)	0.078 (0.796)	0.082 (0.940)
Adjusted R <sup>2</sup>		-0.109	-0.090	-0.112
F statistic		0.587	0.616	0.494
p-value		0.951	0.925	0.977

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

$\Delta EQDD$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

$\Delta EQDD_{adj}$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

$\Delta ACIND$  = Change in proportion of independent directors on the audit committee

$\Delta ACACCEXP$  = Change in proportion of directors on the audit committee with accounting qualifications

$\Delta ACLEGEXP$  = Change in proportion of directors on the audit committee with legal qualifications

$\Delta ACMEET$  = Change in number of audit committee meetings

$\Delta ACSIZE$  = Change in number of audit committee members

$\Delta BDIND$  = Change in proportion of independent directors on the board

$\Delta BDACCEXP$  = Change in proportion of directors on the board with accounting qualifications

$\Delta BDLEGEXP$  = Change in proportion of directors on the board with legal qualifications

$\Delta BDMEET$  = Change in number of board meetings

$\Delta BDSIZE$  = Change in number of board members

$\Delta AUDITOR$ : 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise

$LN\Delta SIZE$  = Natural log of change in company size (as measured by total assets)

$\Delta LEV$  = Change in leverage (as measured by total liabilities divided by total assets)

AC1993: 1 = year after formation is 1993; 0 = otherwise

AC1994: 1 = year after formation is 1994; 0 = otherwise

AC1995: 1 = year after formation is 1995; 0 = otherwise

AC1996: 1 = year after formation is 1996; 0 = otherwise

AC1997: 1 = year after formation is 1997; 0 = otherwise

AC1998: 1 = year after formation is 1998; 0 = otherwise

AC1999: 1 = year after formation is 1999; 0 = otherwise

AC2000: 1 = year after formation is 2000; 0 = otherwise

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

**Table 4.19 Regression estimates of  $\Delta EQDDadj$  on changes in audit committee and control variables for 127 ASX listed companies unstandardised coefficient (t-statistic)**

Variable	Predicted sign	$\Delta EQDDadj$ (Model 1)	$\Delta EQDDadj$ (Model 2)	$\Delta EQDDadj$ (Model 3)
Intercept		0.341 (0.581)	0.264 (0.460)	0.081 (0.158)
$\Delta ACIND$	-	0.018 (0.251)	-0.031 (-0.688)	-0.026 (-0.640)
$\Delta ACACCEXP$	-	-0.026 (-0.306)	-0.028 (-0.489)	-0.022 (-0.414)
$\Delta ACLEGEXP$	-	0.046 (0.407)	0.075 (0.823)	0.072 (0.873)
$\Delta ACMEET$	-	-0.003 (-0.311)	-0.003 (-0.244)	-0.005 (-0.577)
$\Delta ACSIZE$	-	-0.003 (-0.184)	-0.004 (-0.270)	-0.003 (-0.181)
$\Delta BDIND$	-	-0.092 (-0.900)		
$\Delta BDACCEXP$	-	0.019 (0.130)		
$\Delta BDLEGEXP$	-	0.012 (0.082)		
$\Delta BDMEET$	-	0.003 (1.190)	0.004 (1.378)	
$\Delta BDSIZE$	-	0.007 (0.815)	0.006 (0.690)	
$\Delta AUDITOR$	-	-0.025 (-0.380)	-0.029 (-0.444)	-0.034 (-0.585)
$LN\Delta SIZE$	?	-0.015 (-0.559)	-0.012 (-0.455)	-0.004 (-0.153)
$\Delta LEV$	?	-0.002 (-0.018)	-0.014 (-0.166)	0.015 (0.201)
AC1993	?	0.048 (0.512)	0.039 (0.468)	0.036 (0.418)
AC1994	?	-0.013 (-0.154)	-0.005 (-0.058)	0.017 (0.232)
AC1995	?	0.002 (0.030)	0.017 (0.313)	0.019 (0.386)
AC1996	?	-0.046 (-0.752)	-0.031 (-0.543)	-0.044 (-0.839)
AC1997	?	-0.031 (-0.484)	-0.021 (-0.349)	-0.020 (-0.386)
AC1998	?	-0.072 (-1.054)	-0.053 (-0.827)	-0.049 (-0.859)
AC1999	?	-0.115 (-1.791)	-0.111 (-1.809)	-0.116 (-2.085)*
AC2000	?	-0.096 (-1.361)	-0.086 (-1.260)	-0.017 (-0.265)
Capital goods	?	0.042 (0.750)	0.045 (0.822)	0.060 (1.242)
Commercial, services and supplies	?	0.042 (0.600)	0.037 (0.540)	0.049 (0.784)
Energy	?	0.012 (0.217)	0.17 (0.302)	0.010 (0.202)
Food, beverage and tobacco	?	0.008 (0.153)	0.006 (0.122)	0.004 (0.086)
Healthcare	?	-0.090	-0.082	0.010



equipment and services		(-1.347)	(-1.255)	(0.169)
Hotels, restaurants and leisure	?	0.013 (0.176)	0.017 (0.226)	0.018 (0.277)
Materials	?	0.068 (0.714)	0.065 (0.689)	0.059 (0.678)
Media	?	-0.085 (-1.486)	-0.071 (-1.307)	-0.089 (-1.808)
Retailing	?	0.054 (0.824)	0.058 (0.928)	0.061 (1.100)
Software and services	?	0.162 (2.693)**	0.170 (2.879)**	0.150 (2.834)**
Telecommunication services	?	0.120 (1.135)	0.129 (1.258)	0.141 (1.523)
Adjusted R <sup>2</sup>		-0.010	0.012	0.012
F statistic		0.958	1.055	1.059
p-value		0.537	0.408	0.403

\* significant at the 0.05 level (2-tailed)

\*\* significant at the 0.01 level (2-tailed)

(p-values are one-tailed when direction is as predicted, otherwise two-tailed)

$\Delta EQDD$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) model (i.e., absolute value of regression residuals)

$\Delta EQDD_{adj}$  = Change in cross sectional earnings quality proxy from Dechow and Dichev (2002) adjusted for Jones (1991) model variables (i.e., absolute value of regression residuals)

$\Delta ACIND$  = Change in proportion of independent directors on the audit committee

$\Delta ACACCEXP$  = Change in proportion of directors on the audit committee with accounting qualifications

$\Delta ACLEGEXP$  = Change in proportion of directors on the audit committee with legal qualifications

$\Delta ACMEET$  = Change in number of audit committee meetings

$\Delta ACSIZE$  = Change in number of audit committee members

$\Delta BDIND$  = Change in proportion of independent directors on the board

$\Delta BDACCEXP$  = Change in proportion of directors on the board with accounting qualifications

$\Delta BDLEGEXP$  = Change in proportion of directors on the board with legal qualifications

$\Delta BDMEET$  = Change in number of board meetings

$\Delta BDSIZE$  = Change in number of board members

$\Delta AUDITOR$ : 1 = a company with a non-Big 5/6 auditor changed to a Big 5/6 auditor; and 0 = otherwise

$LN\Delta SIZE$  = Natural log of change in company size (as measured by total assets)

$\Delta LEV$  = Change in leverage (as measured by total liabilities divided by total assets)

AC1993: 1 = year after formation is 1993; 0 = otherwise

AC1994: 1 = year after formation is 1994; 0 = otherwise

AC1995: 1 = year after formation is 1995; 0 = otherwise

AC1996: 1 = year after formation is 1996; 0 = otherwise

AC1997: 1 = year after formation is 1997; 0 = otherwise

AC1998: 1 = year after formation is 1998; 0 = otherwise

AC1999: 1 = year after formation is 1999; 0 = otherwise

AC2000: 1 = year after formation is 2000; 0 = otherwise

Capital goods: 1 = company is from that industry; 0 = otherwise

Commercial, services and supplies: 1 = company is from that industry; 0 = otherwise

Energy: 1 = company is from that industry; 0 = otherwise

Food, beverage and tobacco: 1 = company is from that industry; 0 = otherwise

Healthcare equipment and services: 1 = company is from that industry; 0 = otherwise

Hotels, restaurants and leisure: 1 = company is from that industry; 0 = otherwise

Materials: 1 = company is from that industry; 0 = otherwise

Media: 1 = company is from that industry; 0 = otherwise

Retailing: 1 = company is from that industry; 0 = otherwise

Software and services: 1 = company is from that industry; 0 = otherwise

Telecommunication services: 1 = company is from that industry; 0 = otherwise

#### **4.6.4 Additional analysis**

The calculation of the AC\_GOV\_SCORE variable was discussed in section 4.5.4. The change in this variable was substituted for the change in each of the individual audit committee variables and the regressions reported in tables 4.16 and 4.17 were rerun. The regressions were first rerun including the change in each of the board variables and then excluding the change in BDIND, BDACCEXP and BDLEGEXP. These were the variables that were most highly correlated with the related audit committee variables, as reported in tables 4.14 and 4.15. The change in AC\_GOV\_SCORE was not significant in any of the regressions that were rerun.

#### **4.7 Conclusion**

This Chapter presents the results obtained from the statistical tests undertaken in this research. First, there is a discussion of the population from which the sample was drawn, followed by an explanation of the samples used in the three groups of tests. Second, the results obtained from the tests that examined the association between audit committee formation and financial reporting quality are analysed. Third, there is a discussion of the results from the tests on the association between the characteristics of audit committees and financial reporting quality. The final section details the test results on the association between the changes in the audit committee characteristics and changes in financial reporting quality. Chapter 5 provides the conclusions drawn from these results about the hypotheses and research questions and discusses the implications of this research for theory, policy and practice.

## 5 Conclusions and Implications

### 5.1 Introduction

This Chapter draws together the discussion in the previous Chapters and provides conclusions and implications from the results discussed in Chapter 4. The Chapter is organised as follows: section 5.2 draws conclusions about the hypotheses developed in Chapter 2; section 5.3 draws conclusions about the two research questions identified in Chapter 1; section 5.4 provides several implications for theory; section 5.5 identifies a number of implications for policy and practice; section 5.6 discusses several limitations of this research; and section 5.7 highlights a number of avenues for future research.

### 5.2 Conclusions about hypotheses

#### 5.2.1 Audit committee formation

In the context of agency theory, there are incentives for companies to establish corporate governance controls, such as audit committees, due to the inability of shareholders to directly observe management's actions (Jensen and Meckling 1976; Dellaportas et al. 2005). Furthermore, audit committees have been widely recommended in Australia and overseas as an important means of improving the quality of corporate financial reporting practices (e.g., Blue Ribbon Committee 1999; AARF, IIAA and AICD 2001; Ramsay 2001; ASX Corporate Governance Council 2003). Therefore, it was proposed that:

*H1: The formation of an audit committee is positively associated with an increase in financial reporting quality.*

The parametric t-test found that the difference between the means of the earnings quality variables derived from the modified Jones (1991) model was significant at the 0.01 level. The mean for the variable in the year after audit committee formation was less than the mean for the variable in the year before formation. This result suggests that earnings quality, calculated from the modified Jones (1991) model, significantly increased following the formation of the audit

committee. This is because there is an inverse relation between the value of the earnings quality variables and the level of earnings quality, i.e., the lower the value of the variables, the higher the quality of earnings and vice versa. The non-parametric Wilcoxon signed ranks test provided support for this result. As section 2.4.2 noted, earnings quality is one means of measuring financial reporting quality. Consequently, there is some support for hypothesis 1 that the formation of an audit committee is positively associated with an increase in financial reporting quality.

The significant result for the modified Jones (1991) model variable was not supported in the tests involving the two earnings quality measures derived from the Dechow and Dichev (2002) model. For these two measures, the t-test showed that there was no significant difference in the means of the earnings quality variables in the years before and after audit committee formation. Similar results were obtained from the Wilcoxon signed ranks test. This insignificant result could be partly because the Dechow and Dichev (2002) model does not separate intentional and unintentional accrual estimation errors because they both imply low-quality accruals and earnings. Audit committees may only be effective at influencing the intentional errors, which are better captured by the Jones (1991) model.

While several studies have examined factors associated with audit committee formation (Eichenseher and Shields 1985; Pincus, Rusbarsky and Wong 1989; Bradbury 1990; Collier 1993; Adams 1997; Carson 2002; Chau and Leung 2006), few have analysed the link between audit committee formation and financial reporting quality. Wild (1994) and Jeon, Choi and Park (2004) are the only known published papers that have directly examined this issue. Wild (1994) examined the extent of reaction to the release of earnings reports before and after audit committee formation. The results indicated a significant increase in the market reaction to earnings reports released after the formation of the audit committee. Jeon, Choi and Park (2004) operationalised financial reporting quality by using a modified Jones (1991) model to develop a measure for earnings management for a sample of Korean companies. The findings indicated that there was no significant decrease in earnings management, compared to the period before establishment, for firms that established audit committees. Conversely, the earnings quality of the sample companies had not improved following the establishment of the audit committees.

Therefore, while Wild (1994) provides some support for the results of this research, there is a conflict between the results of Jeon, Choi and Park (2004) and the

results of this research involving the modified Jones (1991) model variables. A reason for this inconsistency may be the different legal environments between Korea and Australia. The sample companies analysed by Jeon, Choi and Park (2004) included a majority that were required by Korean government law to establish an audit committee. The period of study for this research was prior to the mandatory requirement for audit committee formation by large Australian listed companies, which came into effect on 1 January 2003. Audit committees that are formed voluntarily, not because of a government requirement, may be more effective at constraining earnings management and therefore improving earnings quality. This is because they have other incentives to ensure their audit committees operate effectively, which drove the decision to voluntarily form an audit committee.

### **5.2.2 Audit committee characteristics**

The hypotheses related to various audit committee characteristics are restated below:

*H2a: The independence of an audit committee is positively associated with financial reporting quality;*

*H3a: The expertise of an audit committee is positively associated with financial reporting quality;*

*H4a: The activity of an audit committee is positively associated with financial reporting quality;*

*H5a: The size of an audit committee is positively associated with financial reporting quality;*

*H6: The tenure of an audit committee is positively associated with financial reporting quality.*

From the univariate results reported in section 4.5.2, there is some limited evidence of a positive association between earnings quality and the proportion of independent audit committee members, audit committee size and the number of years

since the formation of the audit committee. This provides some support for hypotheses 2a, 5a and 6. However, these results do not hold in a multivariate context. For the regression model that used the dependent variable derived from the modified Jones (1991) model, none of the coefficients for the audit committee variables were significant at the 0.01 or 0.05 levels. A similar result was obtained for the regression models that used the two Dechow and Dichev (2002) model dependent variables. These results suggest that none of the audit committee characteristics were positively associated with earnings quality and financial reporting quality for the sample companies after controlling for correlated variables. Therefore, no support was found for hypotheses 2a, 3a, 4a, 5a or 6 in the multivariate tests.

Several prior studies have also found that some audit committee characteristics were not significantly associated with earnings management and, therefore, earnings quality. Choi, Jeon and Park (2004), Bedard, Chtourou and Courteau (2004) and Davidson, Goodwin-Stewart and Kent (2005) each found that audit committee activity was not significantly associated with earnings management. Bedard, Chtourou and Courteau (2004), Vafeas (2005) and Davidson, Goodwin-Stewart and Kent (2005) each found a similar result in relation to audit committee size. The results of Van der Zahn and Tower (2004) failed to show an association between the magnitude of earnings management and the audit committee's financial expertise amongst the independent directors. Yang and Krishnan (2005) found no significant association between either audit committee independence or financial expertise and quarterly discretionary accruals. A similar result regarding audit committee independence was found in Rahman and Ali (2006).

However, there are some inconsistencies between the results of this research and several prior studies. The following audit committee characteristics have been found to be significantly associated with measures of earnings management or earnings quality: independence (Klein 2002a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Van der Zahn and Tower 2004; Davidson, Goodwin-Stewart and Kent 2005; Vafeas 2005); expertise (Xie, Davidson and DaDalt 2003a; Bedard, Chtourou and Courteau 2004; Choi, Jeon and Park 2004; Dhaliwal, Naiker and Navissi 2006); activity (Xie, Davidson and DaDalt 2003a; Van der Zahn and Tower 2004; Vafeas 2005); and size (Choi, Jeon and Park 2004; Yang and Krishnan 2005). Therefore, there have been mixed results in the literature about the association

between certain audit committee characteristics, earnings management and earnings quality.

There could be a number of reasons for the differences between the results of this research and the prior studies referred to in the previous paragraph. First, many of the prior studies were conducted in the United States where audit committees have been more highly regulated than in Australia. Therefore, US companies have been given more guidance from regulators about areas such as the composition and size of their audit committee, which could potentially make the committees more effective. Furthermore, the audit committees of many companies in the United States have been in existence since 1978, which means they have more experience in carrying out their duties than most audit committees in Australia. The use of Australian data in this research avoided the confounding effect of audit committee regulation existing in the United States. Therefore, Australia provided a superior empirical setting for the examination of the association between audit committees and financial reporting quality.

Second, the more litigious legal environment in the United States may create greater incentives for company directors sitting on audit committees to work towards reducing earnings management, thereby improving their companies' financial reporting quality. Third, there were differences between some of the specific measurements used for the dependent and independent variables. For example, Davidson, Goodwin-Stewart and Kent (2005) used non-executive directors to develop their measures of audit committee independence, instead of independent directors that were used in this research. When non-executive directors with related party transactions were excluded, one of their measures of audit committee independence was not significant (Davidson, Goodwin-Stewart and Kent 2005).

### **5.2.3 Changes in audit committee characteristics**

The hypotheses on the association between changes in the audit committee characteristics and changes in financial reporting quality are restated below:

*H2b: An increase in the independence of an audit committee is positively associated with an increase in financial reporting quality;*

*H3b: An increase in the expertise of an audit committee is positively associated with an increase in financial reporting quality;*

*H4b: An increase in the activity of an audit committee is positively associated with an increase in financial reporting quality;*

*H5b: An increase in the size of an audit committee is positively associated with an increase in financial reporting quality.*

These hypotheses were tested by regressing changes in the earnings quality variables between the year after audit committee formation and 2001, on changes in the audit committee and control variables over the same period. For the change in the dependent variable derived from the modified Jones (1991) model, the regression results show that the changes in the audit committee variables were not significant. The regression models that used the changes in the two Dechow and Dichev (2002) model dependent variables yielded similar results. These results suggest that increases in each of the audit committee variables were not positively associated with increases in earnings quality and financial reporting quality. Therefore, support was not found for hypotheses 2b, 3b, 4b or 5b.

Most of the similar prior studies used only cross sectional tests to analyse the association between audit committee characteristics and financial reporting quality. Such tests suffer from the potential problem of omitted variables. This research has extended the prior literature by also analysing this association over time. The results from this analysis provide support for the results from the cross sectional tests.

Furthermore, this research used two models to develop three proxy measures for financial reporting quality. These models were derived from Jones (1991) and Dechow and Dichev (2002). Most of the prior studies only used variations of the original Jones (1991) model. Similar results were obtained when both of these models were used. This provides additional support for the lack of a significant association between audit committee characteristics and financial reporting quality for the sample of Australian companies used in this research. Most of the prior studies used US data, where audit committees have been more strictly regulated. Therefore, Australia represented a superior empirical setting.



### 5.3 Conclusions about research questions

The two research questions investigated in this research are restated below:

*Is the formation of audit committees associated with improved financial reporting quality?*

*Are certain audit committee characteristics associated with improved financial reporting quality?*

From the discussion on the hypotheses, several conclusions can be drawn about these research questions in relation to the companies included in the sample. For the first research question, there was some evidence to support a positive association between the formation of audit committees and improved financial reporting quality. This conclusion arises from the significant difference in the means of the modified Jones (1991) model earnings quality variables between the years before and after audit committee formation. However, a significant result was not found for the Dechow and Dichev (2002) model variables. A possible reason for this inconsistent result is that audit committees are only effective at influencing intentional accrual estimation errors, which are not separated out by the Dechow and Dichev (2002) model.

For the second research question, there was only limited univariate support for the association between certain audit committee characteristics and improved financial reporting quality. None of the characteristics tested were significantly positively associated with the earnings quality variables in the multivariate tests. It is, therefore, concluded that the audit committee characteristics investigated in this research are not associated with improved financial reporting quality.

### 5.4 Implications for theory

The conclusions from this research have several theoretical implications. First, agency theory predicts that corporate governance controls, such as audit committees, are implemented to align managers' and shareholders' incentives, thus limiting the ability of managers to act opportunistically (Dellaportas et al. 2005). These opportunistic activities can include the management of the company's earnings "...to

either mislead some stakeholders about the underlying performance of the company or to influence contractual outcomes that depend on reported accounting numbers" (Healy and Wahlen 1999, p. 368). Earnings management has a negative impact on the quality of earnings and, therefore, the financial reports produced by companies. This research illustrated that the formation of audit committees significantly reduced the level of earnings management, thereby improving overall financial reporting quality.

Second, the prior literature suggests that several characteristics of audit committees can enhance their ability to monitor the financial reporting process. These characteristics include the committees' independence, expertise, activity, size and tenure. However, this research found that these characteristics were not significantly associated with improved financial reporting quality. Therefore, this suggests that, once audit committees are established, variations in their characteristics do not make a significant difference to financial reporting quality.

Finally, this research used two empirical models to develop proxy measures of financial reporting quality. The Jones (1991) model has been widely used in studies where the focus has been on opportunistic earnings management, whereas the Dechow and Dichev (2002) model is relatively newer and develops an earnings quality proxy that includes both intentional and unintentional estimation errors in accruals. These models yielded different results in the tests that examined the association between audit committee formation and financial reporting quality. The results were significant for the modified Jones (1991) model variables, but not for the Dechow and Dichev (2002) model variables. This suggests that audit committees are more effective at reducing opportunistic earnings management, rather than unintentional accrual estimation errors that also have a negative impact on earnings quality.

## **5.5 Implications for policy and practice**

There are several implications of this research for policy and practice. The Australian Stock Exchange (ASX) will find the results useful in assessing the usefulness of some of the new audit committee listing rules that came into effect from 1 January 2003. The new rules mandated that all entities in the S & P All Ordinaries Index must have an audit committee. This requirement is supported by the results of this research showing that the formation of an audit committee is significantly

associated with improved financial reporting quality. Therefore, there are benefits from companies forming an audit committee in compliance with the new mandatory requirement.

The new listing rules also require all entities in the top 300 of the S & P All Ordinaries Index to comply with the ASX Corporate Governance Council's best practice recommendations regarding the composition, operation and responsibility of the audit committee (Australian Stock Exchange 2006b). The ASX Corporate Governance Council recently announced a review of its Principles of Good Corporate Governance and Best Practice Recommendations (Australian Stock Exchange 2006a). Recommendation 4.3 (ASX Corporate Governance Council 2003) stated that the audit committee should consist of:

- only non-executive directors;
- a majority of independent directors;
- an independent chairperson who is not the board chairperson; and
- at least three members.

This research found that audit committee characteristics including independence and size were not significantly associated with improved financial reporting quality. So, while it is apparent that benefits exist from forming an audit committee, the same benefits do not accrue to companies that, e.g., increase the proportion of independent audit committee members or increase the size of their audit committee. Therefore, there are doubts over the usefulness of several aspects of recommendation 4.3. The ASX should consider reassessing the new listing rules in light of the results of this research and other similar research studies.

## **5.6 Limitations**

While this research has several strengths, a number of limitations require mention. First, the focus of this research was on top 500 Australian listed companies. The reason for this was the wider availability of annual report data for these companies in the databases that were used. Therefore, it is not possible to generalise the results of this research to non-top 500 listed companies. Second, this research relied on company annual reports for the data necessary to test the hypotheses. Consequently, it was not possible to develop a detailed knowledge of the inner workings of audit committees. Third, data on auditor changes and changes in board

characteristics between the years before and after audit committee formation was not collected, which meant it was not possible to test for the influence of these variables on changes in earnings quality. Fourth, the changes tests discussed in section 3.7.3 were based on changes in the variables between the year after audit committee formation and 2001. As the time window for some companies was up to 8 years (i.e., 1994 to 2001), this reduced the ability to attribute changes in earnings quality to changes in audit committee characteristics. Fifth, despite the use of the formation and changes tests, potential endogeneity issues may still remain regarding the interdependence of audit committees and financial reporting quality. Sixth, data on the tenure of individual audit committee members was not collected, which meant it was not possible to test the association between this variable and earnings quality. Seventh, it is possible that the insignificance of the audit committee characteristics may be attributable to the power of the tests, given the reduced sample size.

Finally, this research used the original Dechow and Dichev (2002) model to develop two measures of overall earnings quality. The model was not adjusted to separate the intentional and unintentional components of accrual estimation errors, because both types of errors imply lower quality accruals and earnings (Dechow and Dichev 2002). However, the results for the tests on audit committee formation suggest that audit committees may have a greater influence on intentional errors, which more closely reflect opportunistic earnings management. This conclusion arises from the difference in the results between the Jones (1991) and Dechow and Dichev (2002) models.

While these limitations are acknowledged, they do not detract from the strengths of this research and the importance of its findings. The limitations merely provide platforms for future research, some of which are discussed in the next section.

## **5.7 Further research**

There are several avenues for future research that arise from the limitations addressed in the previous section. First, the data collection could be extended to include non-top 500 Australian listed companies. This would help to determine if the results from this research also hold for smaller companies. Second, a number of case studies of audit committees in Australian companies could be undertaken to obtain a more detailed understanding of the inner workings of the committees. This could

involve attending audit committee meetings and conducting interviews with committee members. Such case studies would require obtaining agreement from company management, which may be difficult to obtain.

Finally, the original Dechow and Dichev (2002) model could be extended to attempt to isolate the intentional or discretionary component of accrual estimation errors, which audit committees may have a greater ability to influence. A similar approach to Francis et al. (2004) and Francis et al. (2005a) could be used. These studies incorporated in their models the five factors considered by Dechow and Dichev (2002) to explain accruals or earnings quality. The five factors were firm size, cash flow variability, sales variability, length of operating cycle and incidence of negative earnings.

Some prior studies suggest that audit committees are an effective corporate governance mechanism, which can improve the quality of companies' financial reporting practices. This research found some support for this notion in terms of audit committee formation, however this did not extend to the analysis of audit committee characteristics. Therefore, the association between audit committees and financial reporting quality appears simpler than the literature suggests and foundations have been set for further research about this association.

## List of References

- AARF, IIAA and AICD 2001, *Best Practice Guide: Audit Committees*.
- Abbott, L., Park, Y. and Parker, S. 2000, 'The effects of audit committee activity and independence on corporate fraud', *Managerial Finance*, vol. 26, no. 11, pp. 55-67.
- Abbott, L. and Parker, S. 2000, 'Auditor selection and audit committee characteristics', *Auditing: A Journal of Practice and Theory*, vol. 19, no. 2, pp. 47-66.
- Abbott, L., Parker, S. and Peters, G. 2004, 'Audit committee characteristics and restatements', *Auditing: A Journal of Practice and Theory*, vol. 23, no. 1, pp. 69-87.
- Abbott, L., Parker, S., Peters, G. and Raghunandan, K. 2003a, 'The association between audit committee characteristics and audit fees', *Auditing: A Journal of Practice and Theory*, vol. 22, no. 2, pp. 17-32.
- Abbott, L., Parker, S., Peters, G. and Raghunandan, K. 2003b, 'An empirical investigation of audit fees, nonaudit fees and audit committees', *Contemporary Accounting Research*, vol. 20, no. 2, pp. 215-235.
- Aboody, D., Hughes, J. and Liu, J. 2005, 'Earnings quality, insider trading and cost of capital', *Journal of Accounting Research*, vol. 43, no. 5, pp. 651-673.
- Adams, M. 1997, 'Determinants of audit committee formation in the life insurance industry: New Zealand evidence', *Journal of Business Research*, vol. 38, no. 2, pp. 123-129.
- Archambeault, D. and DeZoort, F. 2001, 'Auditor opinion shopping and the audit committee', *International Journal of Auditing*, vol. 5, no. 1, pp. 33-52.
- Aspect Financial Pty Ltd 2003, *Aspect Financial Database Guide*, viewed 4 August 2006, <http://www.sirca.org.au/uni/services/Data/accounting/AspectDataGuide.pdf>.
- Aspect Huntley 2006, *DatAnalysis*, viewed 4 August 2006, <http://www.aspecthuntley.com.au/licensee/dat/>.
- ASX Corporate Governance Council 2003, *Principles of Good Corporate Governance and Best Practice Recommendations*.
- Australasian Reporting Awards 2006, viewed 3 August 2006, <http://www.arawards.com.au>.
- Australian Stock Exchange 1994, *Disclosure of Corporate Governance Practices by Listed Companies: A Discussion Paper*.

- Australian Stock Exchange 2006a, *ASX Corporate Governance Council review of the Principles of Good Corporate Governance and Best Practice Recommendations*, viewed 29 November 2006, [http://www.asx.com.au/about/pdf/mr20061102review\\_corporate\\_governance\\_principles.pdf](http://www.asx.com.au/about/pdf/mr20061102review_corporate_governance_principles.pdf).
- Australian Stock Exchange 2006b, *ASX Listing Rules*, viewed 4 August 2006, [http://www.asx.com.au/supervision/rules\\_guidance/listing\\_rules1.htm](http://www.asx.com.au/supervision/rules_guidance/listing_rules1.htm).
- Australian Stock Exchange 2006c, *ASX Report to Shareholders*, viewed 13 September 2006, [http://www.asx.com.au/about/pdf/asx\\_annual\\_report\\_2006.pdf](http://www.asx.com.au/about/pdf/asx_annual_report_2006.pdf).
- Australian Stock Exchange 2006d, *What is GICS?*, viewed 4 August 2006, <http://www.asx.com.au/research/indices/gics.htm>.
- Balsam, S., Krishnan, J. and Yang, J. 2003, 'Auditor industry specialization and earnings quality', *Auditing: A Journal of Practice and Theory*, vol. 22, no. 2, pp. 71-97.
- Bartov, E., Gul, F. and Tsui, J. 2001, 'Discretionary accruals models and audit qualifications', *Journal of Accounting and Economics*, vol. 30, no. 3, pp. 421-452.
- Bathala, C. and Rao, R. 1995, 'The determinants of board composition: An agency theory perspective', *Managerial and Decision Economics*, vol. 16, no. 1, pp. 59-69.
- Baxter, P. 2001, A survey of Australian listed companies' compliance with best practice guidelines for audit committees, Working Paper, Central Queensland University.
- Baysinger, B. and Butler, H. 1985, 'Corporate governance and the board of directors: Performance effects of changes in board composition', *Journal of Law, Economics and Organisation*, vol. 1, no. 1, pp. 101-124.
- Beasley, M. 1996, 'An empirical analysis of the relation between board of director composition and financial statement fraud', *The Accounting Review*, vol. 71, no. 4, pp. 443-465.
- Beasley, M., Carcello, J., Hermanson, D. and Lapides, P. 2000, 'Fraudulent financial reporting: Consideration of industry traits and corporate governance mechanisms', *Accounting Horizons*, vol. 14, no. 4, pp. 441-454.
- Beasley, M. and Salterio, S. 2001, 'The relationship between board characteristics and voluntary improvements in audit committee composition and experience', *Contemporary Accounting Research*, vol. 18, no. 4, pp. 539-570.

- Becker, C., DeFond, M., Jiambalvo, J. and Subramanyam, K. 1998, 'The effect of audit quality on earnings management', *Contemporary Accounting Research*, vol. 15, no. 1, pp. 1-24.
- Bedard, J., Chtourou, S. and Courteau, L. 2004, 'The effect of audit committee expertise, independence, and activity on aggressive earnings management', *Auditing: A Journal of Practice and Theory*, vol. 23, no. 2, pp. 13-35.
- Bernard, V. and Skinner, D. 1996, 'What motivates managers' choice of discretionary accruals?' *Journal of Accounting and Economics*, vol. 22, no. 2, pp. 313-325.
- Blue Ribbon Committee 1999, 'Report and recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees', *The Business Lawyer*, vol. 54, no. 2, pp. 1067-1095.
- Bradbury, M. 1990, 'The incentives for voluntary audit committee formation', *Journal of Accounting and Public Policy*, vol. 9, no. 1, pp. 19-36.
- Cadbury Committee 1992, *Report of The Committee on the Financial Aspects of Corporate Governance*.
- Carcello, J., Hermanson, D. and Neal, T. 2002, 'Disclosures in audit committee charters and reports', *Accounting Horizons*, vol. 16, no. 4, pp. 291-304.
- Carcello, J. and Nagy, A. 2004, 'Client size, auditor specialisation and fraudulent financial reporting', *Managerial Auditing Journal*, vol. 19, no. 5, pp. 651-668.
- Carcello, J. and Neal, T. 2000, 'Audit committee composition and auditor reporting', *The Accounting Review*, vol. 75, no. 4, pp. 453-467.
- Carcello, J. and Neal, T. 2003a, 'Audit committee characteristics and auditor dismissals following "new" going-concern reports', *The Accounting Review*, vol. 78, no. 1, pp. 95-117.
- Carcello, J. and Neal, T. 2003b, 'Audit committee independence and disclosure: Choice for financially distressed firms', *Corporate Governance: An International Review*, vol. 11, no. 4, pp. 289-299.
- Carey, P. and Simnett, R. 2006, 'Audit partner tenure and audit quality', *The Accounting Review*, vol. 81, no. 3, pp. 653-676.
- Carson, E. 1996, 'Corporate governance disclosure in Australia: The state of play', *Australian Accounting Review*, vol. 6, no. 2, pp. 3-10.
- Carson, E. 2002, 'Factors associated with the development of board sub-committees', *Corporate Governance: An International Review*, vol. 10, no. 1, pp. 4-18.
- Chau, G. and Leung, P. 2006, 'The impact of board composition and family ownership on audit committee formation: evidence from Hong Kong', *Journal of International Accounting, Auditing and Taxation*, vol. 15, no. 2, pp. 1-15.



- Chen, K., Lin, K. and Zhou, J. 2005, 'Audit quality and earnings management for Taiwan IPO firms', *Managerial Auditing Journal*, vol. 20, no. 1, pp. 86-104.
- Choi, J., Jeon, K. and Park, J. 2004, 'The role of audit committees in decreasing earnings management: Korean evidence', *International Journal of Accounting, Auditing and Performance Evaluation*, vol. 1, no. 1, pp. 37-60.
- Chung, H. and Kallapur, S. 2003, 'Client importance, nonaudit services and abnormal accruals', *The Accounting Review*, vol. 78, no. 4, pp. 931.
- Chung, R., Firth, M. and Kim, J. 2002, 'Institutional monitoring and opportunistic earnings management', *Journal of Corporate Finance*, vol. 8, no. 1, pp. 29-48.
- Clifford, P. and Evans, R. 1997, 'Non-executive directors: A question of independence', *Corporate Governance: An International Review*, vol. 5, no. 4, pp. 224-231.
- Cohen, J., Krishnamoorthy, G. and Wright, A. 2004, 'The corporate governance mosaic and financial reporting quality', *Journal of Accounting Literature*, vol. 23, no. 1, pp. 87-152.
- Collier, P. 1993, 'Factors affecting the formation of audit committees in major UK listed companies', *Accounting and Business Research*, vol. 23, no. 91A, pp. 421-430.
- Collier, P. and Gregory, A. 1999, 'Audit committee activity and agency costs', *Journal of Accounting and Public Policy*, vol. 18, no. 1, pp. 311-332.
- Connect 4 Pty Ltd 2006, *Annual Reports Collection*, viewed 4 August 2006, <http://www.connect4.com.au>.
- Cotter, J. and Silvester, M. 2003, 'Board and monitoring committee independence', *ABACUS*, vol. 39, no. 2, pp. 211-232.
- CPA Australia 2006, *Accounting handbook*, Pearson Education, Melbourne.
- Davidson, R., Goodwin-Stewart, J. and Kent, P. 2005, 'Internal governance structures and earnings management', *Accounting and Finance*, vol. 45, no. 2, pp. 241-268.
- Davidson, W., Xie, B. and Xu, W. 2004, 'Market reaction to voluntary announcements of audit committee appointments: The effect of financial expertise', *Journal of Accounting and Public Policy*, vol. 23, no. 1, pp. 279-293.
- Dechow, P. and Dichev, I. 2002, 'The quality of accruals and earnings: The role of accrual estimation errors', *The Accounting Review*, vol. 77, no. Supplement, pp. 35-59.

- Dechow, P., Sloan, R. and Sweeney, A. 1995, 'Detecting earnings management', *The Accounting Review*, vol. 70, no. 2, pp. 193-225.
- Dechow, P., Sloan, R. and Sweeney, A. 1996, 'Causes and consequences of earnings manipulation: An analysis of firm's subject to enforcement actions by the SEC', *Contemporary Accounting Research*, vol. 13, no. 1, pp. 1-36.
- DeFond, M. and Jiambalvo, J. 1994, 'Debt covenant violation and manipulation of accruals', *Journal of Accounting and Economics*, vol. 17, no. 1, pp. 145-176.
- Dellaportas, S., Gibson, K., Alagiah, R., Hutchinson, M., Leung, P. and Van Homrigh, D. 2005, *Ethics, governance & accountability: A professional perspective*, John Wiley & Sons, Brisbane.
- DeZoort, F. 1998, 'An analysis of experience effects on audit committee members' oversight judgements', *Accounting Organisations and Society*, vol. 23, no. 1, pp. 1-21.
- DeZoort, F., Hermanson, D., Archambeault, D. and Reed, S. 2002, 'Audit committee effectiveness: A synthesis of the empirical audit committee literature', *Journal of Accounting Literature*, vol. 21, no. 1, pp. 38-75.
- DeZoort, F. and Salterio, S. 2001, 'The effects of corporate governance experience and financial reporting and audit knowledge on audit committee members' judgements', *Auditing: A Journal of Practice and Theory*, vol. 20, no. 2, pp. 31-47.
- Dhaliwal, D., Naiker, V. and Navissi, F. 2006, Audit committee financial expertise, corporate governance and accruals quality: An empirical analysis, Working Paper, University of Arizona, University of Auckland and Monash University.
- Dowdell, T. and Krishnan, J. 2004, 'Former audit firm personnel as CFOs: Effect on earnings management', *Canadian Accounting Perspectives*, vol. 3, no. 1, pp. 117-142.
- Eichenseher, J. and Shields, D. 1985, 'Corporate director liability and monitoring preferences', *Journal of Accounting and Public Policy*, vol. 4, no. 1, pp. 13-31.
- Elliott, G. and Roberts, J. 2003, 'ASX lays down the law', *The Australian*, 31 March, p. 29.
- English, L. 1994, 'Making audit committees work', *Australian Accountant*, vol. 45, no. 4, pp. 10-18.
- Engel, E. 2005, 'Discussion of Does the market value financial expertise on audit committees of boards of directors', *Journal of Accounting Research*, vol. 43, no. 2, pp. 195-204.
- Felo, A., Krishnamurthy, S. and Solieri, S. 2003, Audit committee characteristics and the perceived quality of financial reporting: An empirical analysis, Working

Paper, Penn State University, Binghamton University and University of Scranton.

- Fosberg, R. 1989, 'Outside directors and managerial monitoring', *Akron Business and Economic Review*, vol. 20, no. 2, pp. 24-32.
- Francis, J., LaFond, R., Olsson, P. and Schipper, K. 2004, 'Costs of equity and earnings attributes', *The Accounting Review*, vol. 79, no. 4, pp. 967-1010.
- Francis, J., LaFond, R., Olsson, P. and Schipper, K. 2005a, 'The market pricing of accruals quality', *Journal of Accounting and Economics*, vol. 39, no. 2, pp. 295-327.
- Francis, J., Maydew and Sparks 1999, 'The role of big 6 auditors in the credible reporting of accruals', *Auditing: A Journal of Practice and Theory*, vol. 18, no. 2, pp. 17-34.
- Francis, J., Nanda, D. and Olsson, P. 2005b, Voluntary disclosure, information quality and costs of capital, Paper presented to the UTS Research Summer School, Sydney.
- Francis, J., Olsson, P. and Schipper, K. 2005c, Call options and accruals quality, Paper presented to the UTS Research Summer School, Sydney.
- Frankel, R., Johnson, M. and Nelson, K. 2002, 'The relation between auditors' fees for nonaudit services and earnings management', *The Accounting Review*, vol. 77, no. Supplement, pp. 71-105.
- Gendron, Y., Bedard, J. and Gosselin, M. 2004, 'Getting inside the black box: A field study of practices in "effective" audit committees', *Auditing: A Journal of Practice and Theory*, vol. 23, no. 1, pp. 153-171.
- Goodwin-Stewart, J. and Kent, P. 2006, 'Relation between external audit fees, audit committee characteristics and internal audit', *Accounting and Finance*, vol. 46, no. 3, pp. 387-404.
- Guay, W., Kothari, S. and Watts, R. 1996, 'A market-based evaluation of discretionary accrual models', *Journal of Accounting Research*, vol. 34, no. Supplement, pp. 83-105.
- Gul, F., Chen, C. and Tsui, J. 2003, 'Discretionary accounting accruals, managers' incentives and audit fees', *Contemporary Accounting Research*, vol. 20, no. 3, pp. 441-464.
- Guy, D. and Zeff, S. 2002, 'Independence and objectivity: Retired partners on audit committees', *The CPA Journal*, vol. 57, no. 7, pp. 31-34.
- Haahr, M. 2006, *random.org*, viewed 4 August 2006, <http://www.random.org/>.

- Hansen, G. 1999, Bias and measurement error in discretionary accrual models, Working Paper, Penn State University.
- Healy, P. and Wahlen, J. 1999, 'A review of earnings management literature and its implications for standard setting', *Accounting Horizons*, vol. 13, no. 4, pp. 365-383.
- Hermalin, B. and Weisbach, M. 1988, 'The determinants of board composition', *RAND Journal of Economics*, vol. 19, no. 4, pp. 589-606.
- Hermalin, B. and Weisbach, M. 1991, 'The effects of board composition and direct incentives on firm performance', *Financial Management*, vol. 20, no. 3, pp. 101-112.
- Hodge, F. 2003, 'Investors' perceptions of earnings quality, auditor independence, and the usefulness of audited financial information', *Accounting Horizons*, vol. 17, no. Supplement, pp. 37-48.
- Hossain, M., Cahan, S. and Adams, M. 2000, 'The investment opportunity set and the voluntary use of outside directors', *Accounting and Business Research*, vol. 30, no. 4, pp. 263-273.
- House of Representatives Standing Committee on Legal and Constitutional Affairs 1992, *Corporate Practices and the Rights of Shareholders*, AGPS, Canberra.
- Jensen, M. and Meckling, W. 1976, 'Theory of the firm: Managerial behaviour, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3, no. 4, pp. 305-360.
- Jeon, K., Choi, J. and Park, J. 2004, 'The relationship between new audit committee establishment and earnings management', *Korean Accounting Review*, vol. 29, no. 1, pp. 143-178.
- Jeter, D. and Shivakumar, L. 1999, 'Cross-sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event-specific earnings management', *Accounting and Business Research*, vol. 29, no. 4, pp. 299-319.
- Jonas, G. and Blanchet, J. 2000, 'Assessing quality of financial reporting', *Accounting Horizons*, vol. 14, no. 3, pp. 353-363.
- Jones, J. 1991, 'Earnings management during import relief investigations', *Journal of Accounting Research*, vol. 29, no. 2, pp. 193-228.
- Kalbers, L. and Fogarty, T. 1993, 'Audit committee effectiveness: An empirical investigation of the contribution of power', *Auditing: A Journal of Practice and Theory*, vol. 12, no. 1, pp. 24-42.

- Kalbers, L. and Fogarty, T. 1998, 'Organizational and economic explanations for audit committee oversight', *Journal of Managerial Issues*, vol. X, no. 2, pp. 129-150.
- Karamanou, I. and Vafeas, N. 2005, 'The association between corporate boards, audit committees and management forecasts: an empirical analysis', *Journal of Accounting Research*, vol. 43, no. 3, pp. 453-486.
- Kasznik, R. 1999, 'On the association between voluntary disclosure and earnings management', *Journal of Accounting Research*, vol. 37, no. 1, pp. 57-81.
- Klein, A. 2002a, 'Audit committee, board of director characteristics and earnings management', *Journal of Accounting and Economics*, vol. 33, no. 1, pp. 375-400.
- Klein, A. 2002b, 'Economic determinants of audit committee independence', *The Accounting Review*, vol. 77, no. 2, pp. 435-452.
- Klein, A. 2003, 'Likely effects of stock exchange governance proposals and Sarbanes-Oxley on corporate boards and financial reporting', *Accounting Horizons*, vol. 17, no. 4, pp. 343-355.
- Koh, P. 2003, 'On the association between institutional ownership and aggressive corporate earnings management in Australia', *The British Accounting Review*, vol. 35, no. 1, pp. 105-128.
- KPMG 1999, *Shaping the Audit Committee Agenda*.
- Krishnamoorthy, G., Wright, A. and Cohen, J. 2002a, 'Audit committee effectiveness and financial reporting quality: Implications for auditor independence', *Australian Accounting Review*, vol. 12, no. 3, pp. 3-13.
- Krishnamoorthy, G., Wright, A. and Cohen, J. 2002b, 'Auditors' views on audit committees and financial reporting quality', *The CPA Journal*, vol. 72, no. 10, pp. 56-57.
- Krishnan, G. 2003, 'Does big 6 auditor industry expertise constrain earnings management?' *Accounting Horizons*, vol. 17, no. Supplement, pp. 1-16.
- Krishnan, J. 2005, 'Audit committee quality and internal control: an empirical analysis', *The Accounting Review*, vol. 80, no. 2, pp. 649-676.
- Lang, M. and Lundholm, R. 1993, 'Cross-sectional determinants of analyst ratings of corporate disclosures', *Journal of Accounting Research*, vol. 31, no. 2, pp. 246-271.
- Lang, M. and Lundholm, R. 1996, 'Corporate disclosure policy and analyst behaviour', *The Accounting Review*, vol. 71, no. 4, pp. 467-492.

- Larcker, D. and Richardson, S. 2004, 'Fees paid to audit firms, accrual choices and corporate governance', *Journal of Accounting Research*, vol. 42, no. 3, pp. 625-658.
- Lee, H., Mande, V. and Ortman, R. 2004, 'The effect of audit committee and board of director independence on auditor resignation', *Auditing: A Journal of Practice and Theory*, vol. 23, no. 2, pp. 131-146.
- Levitt, A. 1998, *The Numbers Game*, viewed 19/01/01, <http://www.sec.gov/news/speeches/spch220.txt>.
- Lin, J., Li, J. and Yang, J. 2006, 'The effect of audit committee performance on earnings quality', *Managerial Auditing Journal*, vol. 21, no. 9, pp. 921-933.
- McDaniel, L., Martin, R. and Maines, L. 2002, 'Evaluating financial reporting quality: The effects of financial expertise versus financial literacy', *The Accounting Review*, vol. 77, no. Supplement, pp. 139-167.
- McMullen, D. 1996, 'Audit committee performance: An investigation of the consequences associated with audit committees', *Auditing: A Journal of Practice and Theory*, vol. 15, no. 1, pp. 87-103.
- McNichols, M. 2002, 'Discussion of The quality of accruals and earnings: The role of accrual estimation errors', *The Accounting Review*, vol. 77, no. Supplement, pp. 61-69.
- Menon, K. and Williams, D. 1994, 'The use of audit committees for monitoring', *Journal of Accounting and Public Policy*, vol. 13, no. 1, pp. 121-139.
- Menon, K. and Williams, D. 2004, 'Former audit partners and abnormal accruals', *The Accounting Review*, vol. 79, no. 4, pp. 1095-1118.
- Monroe, G., Teh, S. and Robinson, P. 1995, 'The effect of audit committees on the likelihood of receiving a qualified audit opinion', *Perspectives on Contemporary Auditing*, vol. 7, no. 1, pp. 17-31.
- Moroney, R. and Simnett, R. 1996, 'Audit committee disclosure by listed companies', *Charter*, vol. 48, no. 10, pp. 59-61.
- National Commission on Fraudulent Financial Reporting 1987, *Report of the National Commission on Fraudulent Financial Reporting*.
- Peasnell, K., Pope, P. and Young, S. 2005, 'Board monitoring and earnings management: Do outside directors influence abnormal accruals?' *Journal of Business Finance & Accounting*, vol. 32, no. 7/8, pp. 1311-1346.
- Pincus, K., Rusbarsky, M. and Wong, J. 1989, 'Voluntary formation of corporate audit committees among NASDAQ firms', *Journal of Accounting and Public Policy*, vol. 8, no. 1, pp. 239-265.

- Price Waterhouse 1993, *Improving Audit Committee Performance: What Works Best*. Institute of Internal Auditors Research Foundation, Altamonte Springs.
- Psaros, J. and Seamer, M. 2002, *Horwath 2002 Corporate Governance Report*.
- Rahman, R. and Ali, F. 2006, 'Board, audit committee, culture and earnings management: Malaysian evidence', *Managerial Auditing Journal*, vol. 21, no. 7, pp. 783-804.
- Ramsay, I. 2001, *Independence of Australian Company Auditors: Review of Current Australian Requirements and Proposals for Reform*. Commonwealth of Australia, Canberra.
- Savich, R. 2006, 'Cherry-picking Sarbanes-Oxley', *Journal of Accountancy*, vol. 201, no. 6, pp. 71-74.
- Schellenger, M., Wood, D. and Tashakori, A. 1989, 'Board of director composition, shareholder wealth and dividend policy', *Journal of Management*, vol. 15, no. 2, pp. 457-467.
- Schipper, K. 1989, 'Commentary on earnings management', *Accounting Horizons*, vol. 36, no. 4, pp. 91-102.
- Schipper, K. and Vincent, L. 2003, 'Earnings quality', *Accounting Horizons*, vol. 17, no. Supplement, pp. 97-110.
- Senate Standing Committee on Legal and Constitutional Affairs 1989, *Company Directors' Duties: Report on the Social and Fiduciary Obligations of Company Directors*, AGPS, Canberra.
- Sharma, V. 2004, 'Board of director characteristics, institutional ownership, and fraud: Evidence from Australia', *Auditing: A Journal of Practice and Theory*, vol. 23, no. 2, pp. 105-117.
- SIRCA Ltd 2004, *Aspect Financial Database*, viewed 4 August 2006, [http://www.sirca.org.au/uni/services/Data/accounting/aspect\\_financial.html](http://www.sirca.org.au/uni/services/Data/accounting/aspect_financial.html).
- Song, J. and Windram, B. 2004, 'Benchmarking audit committee effectiveness in financial reporting', *International Journal of Auditing*, vol. 8, no. 3, pp. 195-205.
- Spangler, W. and Braiotta, L. 1990, 'Leadership and corporate audit committee effectiveness', *Group and Organisational Studies*, vol. 15, no. 2, pp. 134-157.
- SPSS Inc 2004, *SPSS 13.0 for Windows*.
- Stapledon, G. and Lawrence, J. 1997, 'Board composition, structure and independence in Australia's largest listed companies', *Melbourne University Law Review*, vol. 21, no. 1, pp. 150-186.

- Subramanyam, K. 1996, 'The pricing of discretionary accruals', *Journal of Accounting and Economics*, vol. 22, no. 1-3, pp. 249-281.
- Tabachnick, B. and Fidell, L. 1989, *Using multivariate statistics*, 2nd edn, Harper Collins, New York.
- Teoh, S., Welch, I. and Wong, T. 1998a, 'Earnings management and the underperformance of seasoned equity offerings', *Journal of Financial Economics*, vol. 50, no. 1, pp. 63-99.
- Teoh, S., Wong, T. and Rao, G. 1998b, 'Are accruals during initial public offerings opportunistic?' *Review of Accounting Studies*, vol. 3, no. 2, pp. 175-208.
- Turpin, R. and DeZoort, F. 1998, 'The characteristics of firms that voluntarily include an audit committee report in their annual report', *International Journal of Auditing*, vol. 2, no. 1, pp. 35-48.
- Vafeas, N. 2005, 'Audit committees, boards, and the quality of reported earnings', *Contemporary Accounting Research*, vol. 22, no. 4, pp. 1093-1122.
- Van der Zahn, M. and Tower, G. 2004, 'Audit committee features and earnings management: further evidence from Singapore', *International Journal of Business Governance and Ethics*, vol. 1, no. 2/3, pp. 233-257.
- Vanasco, R. 1994, 'The audit committee: An international perspective', *Managerial Auditing Journal*, vol. 9, no. 8, pp. 18-42.
- Vicknair, D., Hickman, K. and Carnes, K. 1993, 'A note on audit committee independence: Evidence from the NYSE on "grey" area directors', *Accounting Horizons*, vol. 7, no. 1, pp. 53-57.
- Watkins, A., Hillison, W. and Morecroft, S. 2004, 'Audit quality: A synthesis of theory and empirical evidence', *Journal of Accounting Literature*, vol. 23, no. 1, pp. 153-193.
- Wild, J. 1994, 'The audit committee and earnings quality', *Journal of Accounting Auditing and Finance*, vol. 22, no. 1, pp. 247-276.
- Wolnizer, P. 1995, 'Are audit committees red herrings?' *Abacus*, vol. 31, no. 2, pp. 45-66.
- Working Party of the Ministerial Council for Corporations 1997, *Review of the Requirements for the Registration and Regulation of Company Auditors*. Australian Government Publishing Service, Canberra.
- Xie, B., Davidson, W. and DaDalt, P. 2003a, 'Earnings management and corporate governance: the role of the board and the audit committee', *Journal of Corporate Finance*, vol. 9, no. 3, pp. 295-316.



- Xie, B., Xie, H. and Xu, W. 2003b, Earnings quality and audit committee monitoring service: Evidence from audit committee meeting frequency, Working Paper, Southern Illinois University, University of Illinois and Vanderbilt University.
- Yang, J. and Krishnan, J. 2005, 'Audit committees and quarterly earnings management', *International Journal of Auditing*, vol. 9, no. 3, pp. 201-219.
- Zahra, S. and Pearce, J. 1989, 'Board of directors and corporate financial performance: A review and integrative model', *Journal of Management*, vol. 15, no. 2, pp. 291-334.