

School of Accounting

**Internal Audit: Corporate Governance Issues impacting its Existence in ASX Listed
Firms and its influence on Earnings Management**

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Declaration

To the best of my knowledge and belief, this thesis contains no material that has been published previously by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature:

Date:

Dedication

To my loving family:

To my mother, father and only brother

My prince, Ayaan, and my husband

My in-laws' family, especially my late mother-in-law

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Abbreviations

AC	audit committee
AICPA	American Institute of Certified Public Accountants
APES	Accounting Professional & Ethical Standards Board
ASA	Australian Auditing Standard
ASX	Australian Securities Exchange
ASX CGC	ASX Corporate Governance Council
AUS	Auditing Standard
BOD	board of directors
BRC	Blue Ribbon Committee (of the American Bar Association)
CAE	Chief Audit Executive
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CFO (model)	Jones model controlling for cash flows
CG	corporate governance
CGP&R	Corporate Governance Principles and Recommendations
CIA	certified internal auditor
CLERP 9	<i>Corporate Law Economic Reform Program Act 2004</i>
CPA	certified public accountant
DAC	discretionary accruals
EM	earnings management
FASB	Financial Accounting Standards Board
FRC	Financial Reporting Council
GAAP	generally accepted accounting principles
GICS	Global Industry Classification Standard
IA	internal audit
IAF	internal audit function
IAO	internal audit outsourcing
IAQ	internal audit quality
IIA	Institute of Internal Auditors
IPS	Interagency Policy Statement
ISA	International Standards on Auditing
IT	information technology
LL	log-likelihood
Log	logarithm
MBO	management buy-out

NACD	National Association of Corporate Directors
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
NZ	New Zealand
OLS	ordinary least squares
PCAOB	Public Company Accounting Oversight Board
PMMJM	performance-matched modified Jones model
PPE	property, plant and equipment
R&D	research and development
ROA	return on assets
RQ	research question
S&P	Standard and Poor
SAS	Statements on Auditing Standards
SD	standard deviation
SEC	Securities and Exchange Commission
SOX	<i>Sarbanes–Oxley Act of 2002</i>
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
USA/US	United States of America

Abstract

The objectives of this study are to examine whether corporate governance mechanisms (an effective audit committee and board of directors) conducted by top Australian Securities Exchange (ASX)-listed firms are associated with the decision to establish an internal audit function, with the study also examining both the existence and extent of outsourcing of the audit function. A further test is conducted to assess whether the quality of an internal audit function has any bearing on the decision to outsource audit functions and the extent of outsourcing. This study views earnings management as a barometer to measure a firm's ethical reporting behaviour. Therefore, the study explores the association between the existence of internal audit and outsourcing, and the extent of outsourcing with earnings management. Finally, the quality of the internal audit function is examined to assess its likely influence on earnings management. Using agency theory as the theoretical framework, this study conducts cross-sectional quantitative analyses making use of survey information and financial report data from a sample of 240 ASX-listed firms for the financial year ended 2011.

The main results of the multivariate analyses indicate that independent audit committee members have the most significant influence on the establishment of an internal audit function and on both the existence and extent of outsourcing. The number of board members and having an independent board chair separated from the role of Chief Executive Officer are more likely to have an influence only on the internal audit function. Moreover, internal audit objectivity significantly influences the extent of internal audit outsourcing. Further analyses of this study indicate that the existence of internal audit, the existence and extent of outsourcing, and internal audit quality do not influence earnings management practices. A qualitative assessment of the role and function of outsourcing with respect to ASX-listed firms is also provided in this thesis.

This study explores a distinct institutional environment where internal audit is not mandatory and collectively finds that effective audit committees are more supportive of internal audit and outsourcing functions than the board of directors, while there is no apparent association of the internal audit function with earnings management. The results of this study have extensive implications for regulators, investors, scholars and corporate management.

Chapter One: Introduction

1.1 Background and Motivation

This section provides a brief discussion of the objectives of this study and, in particular, of the existing literature that describes the emerging role of internal audit within the private business sector. Gaps in the research literature are identified and provide the impetus for undertaking further investigations within an Australian context. The epistemological underpinning the research, namely, agency theory, is clearly evident, given the nature of the governance functions involved. Little recent research has been dedicated to examining the emerging role of internal audit within a principles-based governance regime.

Internal audit is a cornerstone of effective corporate governance mechanisms facilitating the evaluation and improvement of risk management and the internal governance environment (Institute of Internal Auditors (IIA) 1999). Porter (2009), in her paper on corporate accountability, makes the point that part of its pivotal underpinnings is formed by internal audit along with the audit committee (AC) and external audit. History has shown that the role of internal audit has evolved from a function with a narrow focus on financial and operational audits to a broader value-added role providing assurance and consulting services across all areas of a corporate enterprise. The earlier literature has explored the developing role and function of internal audit within the public and private spheres of business (Cooper, Leung and Wong 2006; Goodwin 2003; Carcello, Hermanson and Raghunandan 2005b; Goodwin and Yeo 2001; Abbott, Parker and Peters 2010). Using agency theory, most empirical studies involve surveys or the analysis of public financial reports to explain why internal audit as a monitoring activity ameliorates the cost of agency (Adams 1994). Most of the empirical research has been undertaken within the United States of America (USA) and Europe and, to a much lesser extent, within the antipodes. Studies examining the reasons why publicly listed companies employ internal audit functions are particularly scant, especially in Australia. Within a judicial context, Australia has chosen to apply the principles approach to governance with respect to its Australian Securities Exchange (ASX)-listed firms, which

makes any comparative analysis with developed nations like the USA now somewhat superfluous, as that nation's listing requirements in relation to the employment of internal audit is mandated in legislation (e.g., United States Congress 2002).

The ASX Corporate Governance Council (ASX CGC), formed in 2002, was tasked with the object of producing the Corporate Governance Principles and Recommendations (CGP&R) that would be underpinned by the ASX Listing Rules. The CGC has since released three editions (2003; 2007; 2014) of its Principles and Recommendations, as well as minor amendments in 2010. Principle 7, in all editions, deals with governance issues associated with the recognition and management of risk and any references to the use of an internal audit function are enshrined therein. Given the CGC's non-prescriptive and flexible "if not, why not" disclosure approach (ASX CGC, 2nd edition 2007), it is worth noting how its interest in the role of internal audit has altered following the decade of social and economic upheavals that has recently been witnessed. The ASX CGC approach (2007) allows flexibility in that it permits companies the discretion of not following a particular recommendation if they consider it inappropriate. On 13 August 2013, the ASX CGC released its draft third edition for consultation, which included recommended changes to Principle 7. It justified changes based on the fallout from the recent Global Financial Crisis as well as the developing sensitivity of the investment community in particular to emerging environmental and social issues. Principle 7 recommends the need to disclose information about the Risk Committee (7.1); that it annually reviews its risk management framework with management, indicating that this has been undertaken (7.2); and that it discloses how it provides for an independent evaluation of the adequacy and effectiveness of its risk management and internal control processes (7.3). It raises the status of the reference to internal audit as part of Recommendation 7.3, wherein the ASX CGC suggests that firms disclose how the function is structured and what role it performs. The recommendations are meant to encourage firms to review their governance requirements in light of their value to the organisation.

This study extends the prior research by examining the association of audit committee (AC) effectiveness and board of directors' (BOD) effectiveness with the existence of the internal audit function (IAF) in the top ASX-listed firms for the financial year ended 2011. The study further extends the investigation of whether the same corporate governance mechanism (i.e., an effective AC and BOD) is associated with both the existence and extent of internal audit outsourcing (IAO). Through outsourcing, the accounting services industry is providing value-added services (Carey, Subramaniam and Ching 2006). An effective AC and BOD are viewed as key stakeholders in the decisions to employ internal audit and outsource-related functions. An effective AC relies on IAF oversight to assist in regard to assurance, independent evaluation of accounting practices and financial reporting process, risk analysis, fraud analysis and special investigations (Beasley 1996; Raghunandan, Rama and Scarbrough 1998; Scarbrough, Rama and Raghunandan 1998; Abbott and Parker 2000; Raghunandan, Read and Rama 2001; Carcello, Hermanson and Neal 2002; Hermanson and Rittenberg 2003; Carcello, Hermanson and Raghunandan 2005b; Srinivasan 2005). An effective BOD is also responsible for ensuring proper internal control and governance by investigating whether the IAF is performed effectively and efficiently in accordance with professional standards (Badawi et al. 2003). The BOD delegates the responsibility of overseeing the internal control process and financial reporting to the AC members.

The current study is encouraged by earlier efforts to explore the voluntary use of internal audit and outsourcing practices by ASX-listed firms. The study published by Carey, Simnett and Tanewski (2000) investigated the voluntary demand of auditing (internal and external) by Australian family-owned business and reported that 59% of family-owned companies in Australia voluntarily employed internal audit mechanisms. The presence of internal audit in this case is not associated with firm size and debt. Later, Goodwin-Stewart and Kent (2006) examined factors that are likely to predict the extent of the use of this important oversight facility at a time (i.e., 2000) when there was no requirement for a private corporation to possess an audit committee (AC), let alone an internal audit department.

Goodwin-Stewart and Kent (2006) surveyed a sizable sample (450 firms listed on the ASX in October 2000) and found approximately one-third had established an IAF (in-house or outsourced). The study did not report a strong association between internal audit establishment and corporate governance attributes. However, firm size and the firm's level of commitment to risk management were strongly supported in the establishment of the internal audit function. Details of these findings will be further discussed in this thesis.

In the period since Goodwin-Stewart and Kent's (2006a) review was undertaken, the average annual ASX equity market turnover has increased by a factor of two and the number of listed firms has increased to 1,951 domestic registrations in December 2013, a growth of approximately 40% since 2000 (ASX Historical Market Statistics). In addition to this rate of growth in the domestic market, significant events have occurred that have increased concern about the quality of corporate governance within listed firms with these issues resulting in significant tightening of statutory requirements affecting public corporations, including the establishment in 2002 of the ASX Corporate Governance Council (CGC):

- International and local business frauds at the turn of the millennium (e.g., Enron, WorldCom, HIH, etc.) prompted authorities to review their management of corporate bodies, resulting in significant legislative responses in rules-based jurisdictions (Sarbanes–Oxley Act in the USA) and less stringent adjustments within the Australian business sector (Corporate Law Economic Reform Program (CLERP 9 2004)).
- Further business scandals and collapses post-2002 (e.g., Parmalat, Lehman Brothers, Morgan Stanley and AIG) were compounded by serious market adjustments following the Global Financial Crisis and ongoing instability within the US economy and the economies of members of the European Union.

Australia has fared relatively better than most nations although, as in many principles-based jurisdictions, the laws have been adjusted to tighten governance requirements. For example, the top 500 listed firms (making up the All Industries Index) are required to establish an audit committee (AC) and the Financial Reporting Council (FRC) is required to have

oversight over audit independence, giving auditing standards the same force as accounting standards. It is anticipated that Australian-listed firms affected by these local and international economic and legal issues would be particularly sensitive to the need to apply governance arrangements that further the goal of appropriately managing risk and that introduce additional measures to improve internal controls. The decision to incorporate an internal audit function (IAF) would be a major consideration in such a review.

Earlier research (Mathews, Cooper and Leung 1993; Rittenberg and Covaleski 1997; Rittenberg, Moore and Covaleski 1999; Carey, Simnett and Tanewski 2000; Martin and Lavine 2000; Subramaniam, NG and Carey 2004) highlights a substantial increasing trend in internal audit outsourcing (IAO) in Australia and abroad. Empirical research on the practice of internal audit outsourcing (IAO) is limited in Australia. Mathews , Cooper and Leung (1993), Carey, Simnett and Tanewski (2000) and Subramaniam, Chew, and Carey (2004) in their investigations of the practice of internal audit outsourcing (IAO) in Australia, concluded that it is a common practice providing a better quality of internal audit services. This study further explores the practice of outsourcing decisions in recent times (the financial year of 2011) where more emphasis is being given on the establishment of the internal audit function (IAF) by the regulatory bodies. In line with (Abbott et al. 2007), an effective AC is considered to be an important determinant of outsourcing decision making. An effective BOD as a body is also expected to provide ancillary input to these decisions: it is therefore included in this study which also reviews the internal audit quality for those firms with an internal audit function (IAF). Firms with an IAF are tending to add value by employing expert and specialised audit team members who influence internal audit outsourcing (IAO) decision making, thus reducing reliance on such services.

This study also explores whether internal audit and outsourcing play an important role in earnings management ensuring better external financial reporting. While providing value-added services to improve risk management and a better internal control environment, internal audit scrutinises financial records and processes (Prawitt, Smith and Wood 2009). By

maintaining ethical practices in internal auditing, the use of earnings management by the misrepresentation of financial information is mitigated by the internal audit function (IAF). Little evidence exists in the Australian context regarding whether the existence of an IAF in ASX-listed firms influences earnings management per se. The latest study by Davidson, Goodwin-Stewart and Kent (2005) completed a cross-sectional analysis of 434 ASX-listed firms for the financial year ended 2000 and reports that the establishment of internal and external audit are not significantly related to a reduction in the level of earnings management. The overuse of discretionary accruals by Australian firms is however a major concern and is a primary instrument used in the deception of business investors (Dechow and Skinner 2000; Beneish 2001; Magrath and Weld 2002; Kim, Chung and Firth 2003). The overuse of discretionary accruals (DAC) is also widely used by researchers as a way of gauging the ethical behaviour of firms (Van der Zahn, J.-L. W. M. and Tower 2004; Srinivasan 2005). This present study investigates the association of the IAF with earnings management using recent data for the financial year 2011 having regard for the social and economic events that have occurred over the past decade. Furthermore, this study explores a new area of research on whether both the existence and extent of internal audit outsourcing (IAO) and internal audit quality (IAQ) (for those firms with an IAF) by ASX-listed firms influence earnings management.

This study envisages a significantly different business environment from that experienced and reported by previous researchers. As reported above, many issues have arisen during the past decade necessitating a change in the way in which listed companies manage risk and internal controls. A limited survey conducted in 2010 suggested that less than 80% of the ASX 200 companies disclosed they had an internal audit function (IAF) and the percentage dropped rapidly outside that group (IIA Australia 2013). The significance of this disparity needs to be properly appreciated. It could imply that insufficient consideration is being given by firms to the two essential management requirements: oversight needs to be independent and the processes professionally appraised for the benefit of the BOD and the stakeholders whom it represents. The ASX CGC has only recently raised the importance of internal audit

as an independent arbiter of the quality of a company's risk management and the effectiveness of its internal controls. Therefore, this study formally investigates the influence of an effective AC and BOD on internal audit and outsourcing and the flow-on influence on earnings management for ASX-listed firms using recent 2011 data.

1.2 Research Questions and Objectives

This study attempts to establish a linkage between AC and BOD effectiveness and the internal audit function (IAF) and further examines the influence of internal audit on earnings management, a proxy for ethical financial reporting. The effectiveness of the AC and BOD is examined as these two important corporate governance mechanisms are considered to be the likely determinants of establishing an IAF within ASX-listed firms in recent years. Internal auditing is viewed as improving internal controls and risk management and, as a consequence, firms are less likely to use earnings management. As the BOD delegates the responsibility of overseeing the internal control process and financial reporting to the members of the AC (Badawi et al. 2003), it works as the supreme controller of the internal governance process (Fama and Jensen 1983a, 1983b). An effective AC is responsible for overseeing the entire audit process, including internal audit activities (BRC 1999). This study analyses the impact of AC and BOD effectiveness in deciding to establish an internal audit function (IAF). Effectiveness in this sense means more than the magnitude of effect; it also implies quality in terms of their independent status. According to the best knowledge of the author, none of the prior studies in Australia has attempted to establish a linkage between the existence of internal audit and AC and BOD effectiveness. Furthermore, this study will go an extra step and analyse the impact of these two corporate governance mechanisms with both the existence and extent of internal audit outsourcing (IAO) for those firms with an internal audit function (IAF). Firms with an IAF may not be involved with outsourcing or may undertake partial or full outsourcing of their activities. Outsourcing is the consequence of a strategic response to growing competitiveness and is receiving more attention in Australia and abroad. The Institute of Internal Auditors (IIA 1994, 1996) argues that specific types of internal audit outsourcing

(IAO) can be beneficial and cost-effective and can help to improve internal audit quality. This study also examines whether internal audit quality (only for those firms with an IAF) has any influence on outsourcing practices. Again, to the best knowledge of the author, none of the Australian studies has investigated the impact of AC and BOD effectiveness on both the existence and extent of outsourcing. Given the paucity of information relating to the nature and purpose of outsourcing in Australia, the survey of selected firms will provide a substantial qualitative component, the results of which will be elaborated in Chapter Five.

As discussed in Section 1.1, Carey, Simnett and Tanewski (2000) investigated the voluntary demand for internal and external audit functions by family-owned Australian businesses. Later, Goodwin-Stewart and Kent (2006) explored the voluntary use of the internal audit function (IAF) by publicly-listed Australian firms and identified the factors influencing the use of an internal audit function (IAF). Their study surveyed a sizable sample of 450 firms listed on the ASX using data from the year 2000 and identified that only one-third of sample companies had established an IAF (in-house or outsourced). Their findings indicate that firm size and the company's level of commitment towards risk management are strongly associated with the establishment of an internal audit function (IAF). Their study further reports that the IAF has a weak association with some corporate governance factors (e.g., board independence and AC effectiveness) but a strong linkage with AC existence and an independent board chair. Another paper by Goodwin-Stewart and Kent (2006) examined the association of internal audit establishment with audit fees and reported that internal audit existence is associated with higher external audit fees. This finding implies that firms with better monitoring and a better corporate governance structure through the establishment of internal audit also require a higher quality audit from external auditors.

This current study specifically attempts to establish a linkage between AC and BOD effectiveness and internal audit and outsourcing practices using recent data for the financial year ended 2011. As discussed in Section 1.1, there is a 10-year period during which Australian regulatory bodies have become much more concerned about the establishment of internal audit

functions and the quality of corporate governance. Moreover, the context in Australia is of considerable interest for this study. Australia has a different institutional environment in terms of its governance practices compared to the USA. Owing to high profile corporate collapses (e.g., HIH, OneTel and Harris Scarfe), the ASX CGC has introduced new principles and recommendations and continues to amend the principles to match the demand of high corporate risk. The ASX CGC published its third and latest edition of “Corporate Governance Principles and Recommendations” in 2014 and strongly recommended that listed companies establish an IAF or that they mention how the role and structure of internal audit is adopted within their company. Evidence is emerging from changes to the recommendations described above that listed firms are responding by establishing independent internal audit functions.

This study’s first research question therefore requires a reassessment of the current position in this regard (RQ1). Research Question 2 (RQ2) involves a detailed examination of the relationships of AC and BOD effectiveness with internal audit in the Australian context using financial year 2011 data at a time when the establishment of an IAF was not mandatory. Research Questions 3 and 4 (RQ3 and RQ4) involve an examination of IAF outsourcing, an issue that has yet to be addressed in any detail within the extant literature. The last three questions will form the basis for the subsequent hypotheses.

The research questions that this study aims to address in this context are therefore framed as follows:

RQ1: Given the various economic and administrative changes that have occurred during the past decade, to what extent are publicly-listed firms making use of internal audit functions (in-house or outsourced)?

RQ2: What factors (in particular, governance-related practices) predict the likelihood that ASX-listed firms will establish an internal audit function?

RQ3: To what extent and in what manner are ASX-listed firms involved with internal audit outsourcing (partially or fully)?

RQ4: What corporate governance mechanisms predict the likelihood and extent of internal audit outsourcing by ASX-listed firms?

In terms of the association between internal audit and outsourcing, this study describes the audit committee (AC) as comprising three characteristics as proxies for effectiveness, namely: the percentage of independent directors; having at least four meetings per annum; and employing at least one director possessing financial (including accounting and non-accounting) expertise. In a broader context, corporate governance best practices point to three characteristics of BOD effectiveness: (a) composition, (b) size and (c) duality. Therefore, a set of secondary objectives is necessary in order to consider the influence of key individual proxies for AC and BOD effectiveness on internal audit existence and both the existence and extent of outsourcing.

Internal audit quality is an added dimension considered in this study. The introduction of more stringent regulations and authoritative recommendations by the ASX CGC's CGP&R focuses on the improvement of internal audit quality. This improvement is associated with the quality of corporate governance including reporting, internal controls, business ethics and overall firm performance (Gordon and Smith 1992; Bailey, Gramling and Ramamoorti 2003; Gramling et al. 2004b). Davidson et al. (2005) investigated the association of internal audit existence with earnings management using the same Australian-listed firm data for the financial year 2000 as was used by Goodwin-Stewart and Kent (2006a). Their study went further by exploring the linkage of internal audit quality with outsourcing and earnings management. A set of secondary objectives therefore needs to be considered in this context to analyse the association of internal audit quality, consisting of six individual characteristics, with the existence and extent of internal audit outsourcing (IAO) practices and earnings management:

RQ5: What internal audit quality factors predict the likelihood as well as the extent of internal audit outsourcing within Australian publicly-listed firms?

RQ6: What internal audit quality factors influence earnings management within Australian publicly-listed firms?

This study seeks to address a further significant objective. That is, it attempts to explore the evidence of a linkage between internal audit and the outsourcing practices of ASX-listed firms with earnings management. Corporate scandals involving inappropriate accounting practices (e.g., Enron, WorldCom, HealthSouth, Qwest, Rite Aid, Tyco, Waste Management Inc. and Xerox) have gained the attention of practitioners, regulators and academics with concerns about the role of internal audit in true and fair financial reporting (Prawitt, Smith and Wood 2009). External auditing standards (AICPA 1997; PCAOB 2007a) recognise the importance of internal audit in the financial reporting process and therefore encourage or require its active employment as part of a governance mosaic. Empirical studies (Eighme and Cashell 2002; Martin et al. 2002; Rezaee 2002; Schwartz and Young 2002; Clikeman 2003; Hala 2003; Rogers and Stocken 2005) have also emphasised the monitoring role of the internal audit function (IAF). By exploring the influence of internal audit and outsourcing on earnings management, this current study extends the studies of Prawitt et al. (2009) and Davidson, Goodwin_Stewart and Kent (2005). Prawitt et al. (2009) used data from the USA, where the establishment of an IAF is mandatory, and linked internal audit quality with earnings management, whereas Davidson, Goodwin_Stewart and Kent (2005) used data from Australian-listed firms for the year 2000, associating the existence of an IAF with earnings management and concluding that the existence of an IAF in a firm did not influence the practice of earnings management. This study has taken into consideration the changes in the Australian corporate and regulatory environment (refer to Section 1.1) and explores the association between the existence of an IAF and earnings management. Furthermore, it explores the linkage between internal audit outsourcing (IAO) and earnings management.

The research questions that aim to address these objectives are therefore framed as follows:

RQ7: To what extent do internal audit functions in Australian publicly-listed firms influence earnings management?

RQ8: To what extent do internal audit outsourcing (partially or fully) in Australian publicly-listed firms influence earnings management?

In addition to answering this study's primary and secondary research questions, a number of other important research objectives are also investigated. Alternative measures of AC effectiveness, BOD effectiveness, earnings management, internal audit quality and related control variables are used to examine the stability and sensitivity of the main results of this study. Moreover, partitioning the sample of firms based on various firm characteristics will provide valuable insights into the variations of the main findings.

1.3 Research Methodology

Briefly stated, this study of Australian publicly-listed firms employs a cross-sectional evaluation of data applying a positivistic paradigm involving the testing of hypotheses partly based on related research. Issues in relation to the quality of internal auditing and outsourcing contain exploratory elements not previously considered in previous research in any robust fashion. The relationship between the IAF and earnings management is also exploratory and represents a likely outcome of the former's growing influence within the governance process.

Data are collected from both primary and secondary sources. Primary sources include a detailed questionnaire survey distributed to chief audit executives during the years 2012–13: this survey aims to acquire information relating to the nature and quality of the internal audit services provided as well as outsourcing practices where applicable. This includes a significant qualitative section allowing executives to discuss perceptions and attitudes towards various policies and practices. Secondary sources include financial data sets and access to copies of financial statements on the internet when considered necessary. Significant descriptive and analytic analyses are undertaken, including univariate and multivariate investigations, mainly using the Statistical Package for the Social Sciences (SPSS) (IBM SPSS Statistics, Version 22).

This study is representative and includes a random selection of almost half the top 500 ASX-listed firms. The top 500 listed firms are selected from 1,546 companies after adjusting for all the common exclusions in order of ranking as per market capitalisation. The top 500 listed firms represent over 90% of the total assets and the firms included are envisaged to be more likely to utilise an internal audit function (IAF).

1.4 Significance of the Study

This study makes various important contributions to the current literature on internal audit and corporate governance practices in general. Firstly, the study provides a comprehensive examination of the relationship between the existence of internal audit and AC and BOD effectiveness. Earlier studies (Jensen 1993; Beasley 1996; Scarbrough, Rama and Raghunandan 1998; Goodwin and Yeo 2001; Raghunandan, Read and Rama 2001; Klein 2002a; Badawi et al. 2003; Goodwin 2003; Jackling and Johl 2009) have discussed the importance of the influence of the AC and BOD on corporate governance processes. Some of these studies associate various components of an effective AC and BOD with being the determinants of the existence or size of an internal audit function (IAF). This study simultaneously focuses on the AC and BOD and explores the influences of these two corporate governance mechanisms on the existence of an internal audit function (IAF).

Secondly, this study provides a deeper insight into corporate governance practices and whether quality is associated with internal audit outsourcing (IAO). This study uses primary data to gain a better understanding of outsourcing and examines the association of AC and BOD effectiveness with both the existence and extent of outsourcing. Although prior studies (Mathews, Cooper and Leung 1995; Rittenberg and Covaleski 1997; Rittenberg, Moore and Covaleski 1999; Carey, Simnett and Tanewski 2000; Martin and Lavine 2000; Subramaniam , Chew and Carey 2004) highlight a substantial increasing trend in internal audit outsourcing (IAO) worldwide, a lack of information exists with respect to outsourcing practices in Australia.

Thirdly, this study provides additional insights on internal audit quality and its influence on outsourcing practices and earnings management, respectively. Internal audit quality has not been adequately investigated in Australia and certainly not with respect to audit outsourcing and earnings management. Therefore, this study provides information on whether internal audit quality factors influence outsourcing thus also aiming to improve overall audit quality. Furthermore, the study examines whether internal audit quality influences earnings management practices in order to ensure financial reporting quality.

Fourthly, this study contributes to the existing literature on earnings management by providing information on whether internal audit and outsourcing have any influence on earnings management as a proxy for unethical financial reporting. The empirical literature has investigated the association of important corporate governance mechanisms (e.g., external audit, the AC and BOD) with earnings management. This study goes further by providing comprehensive information about whether internal audit or the outsourcing of IAFs is linked with financial reporting quality.

Fifthly, this study makes a contribution to the Australian capital market and regulators by exploring a distinct business environment. This study uses data from ASX-listed firms for the recent financial year of 2011. Australia has a distinct business environment where the establishment of internal audit is not mandatory. The CGC approach (2007) allows flexibility in that it permits companies the discretion of not following a particular recommendation if they consider it inappropriate. The latest ASX CGC's CGP&R (2014) statements raise the status of internal audit and are meant to encourage firms to review their governance requirements in light of the value to their organisation. Information within an Australian context from this study provides comparative insights into corporate governance practices in other jurisdictions where the establishment of internal audit is mandatory (e.g., the USA).

Sixthly, this study considers the top 500 ASX-listed firms as its population and selects 240 firms as its sample to which it applies primary and secondary data searches. According to the ASX CGC, larger firms are strongly expected to establish internal audit functions (IAFs).

This study provides insights into the recommendations made by regulatory bodies and examines to what extent larger firms follow these recommendations to improve internal control and governance practices.

Overall, this study encourages the application of the best corporate governance characteristics influencing the use of internal audit and outsourcing. The study enables policy makers and regulators to determine whether internal audit functions (IAFs) and outsourcing are associated with the AC and BOD and if they have any influence on financial reporting quality. Therefore, emphasis may be given to more appropriate AC or BOD characteristics to ensure the provision for internal audit practice implementation.

1.5 Limitations of the Study

While this study is believed to have numerous benefits, it is not without limitations. These limitations will be discussed as the study progresses, during data collection, analysis, evaluation and synthesis. They are not however expected to void the positive contributions that flow from the investigation. At this stage, a number of anticipated factors need to be mentioned. Firstly, this study only considers three characteristics each for the measurement of AC and BOD effectiveness. Although the selected attributes are the ones most commonly used and referred to in the prior literature (Jensen 1993; Beasley 1996; Abbott and Parker 2000; Carcello and Neal 2000; Davidson, Goodwin-Stewart and Kent 2005; Abbott et al. 2007; Jackling and Johl 2009; DeZoort and Salterio 2001a; Kiel and Nicholson 2003), other related attributes are not considered here that might influence relationships vis-á-vis internal auditing. This study uses alternative measures of AC independence and AC meetings for sensitivity analysis and tends to favour the optimisation of the independence issues associated with agency theory.

Secondly, this study uses annual report data from the companies in the sample to collect information relating to AC and BOD effectiveness and to other control variables that may limit the amount and type of data. It is possible that there exists an alternative measure for other proxies within the firm which could be collected through interviews and questionnaires. This

study depends on data collected from annual reports under the assumption that firms are being faithful in disclosing their information in annual reports. If an issue relating to the accuracy and completeness of the information is raised by the data provided in an annual report, this would be considered as a limitation of this study.

Thirdly, a major limitation could be the response rate in terms of the return of completed questionnaires. The ability to complete various statistical analyses relating particularly to outsourcing and the quality of internal audit could be affected. Decisions are made with respect to the choice of variables (including control variables) suitable for regression analysis. Various forms of partitioning tests, for example, the effect of industry bias, may be difficult to complete.

Fourthly, this study concentrates on ASX-listed firms for the financial year ended 2011. The results of this study are not generalisable to non-listed Australian firms or to other countries with different institutional arrangements. Moreover, the results of the study may not be generalisable to spans of time (e.g., three consecutive years of the span 2011–2013, etc.).

1.6 Organisation of Thesis

The remaining chapters in this thesis are organised as follows. Chapter Two provides a detailed description of the related literature review of this study. Emphasis is given to discussing the internal audit function (IAF), internal audit outsourcing (IAO), two key corporate governance mechanisms (i.e., the AC and BOD), internal audit quality and earnings management issues that are related to the research objectives. Chapter Three discusses the theoretical framework used in this study. This chapter also discusses the related literature and rationale used to test the hypotheses which is followed by the conceptual schema of this study.

Chapter Four discusses the research methodology in detail to provide all the information relating to sample and time period selection, the processes of data collection and measurement of all variables used in this study. The chapter later describes the statistical and sensitivity analyses that help to support the hypotheses. Chapter Five provides descriptive statistics of all variables used in the regression analyses in this study as well as Pearson's correlation analyses

to provide information pertinent to the matrices of variables prior to explaining the main regression results. A sizeable discussion of the qualitative data associated with outsourcing is also provided and will enrich the descriptive analysis. Chapter Six discusses the multivariate results connected with all the hypotheses of this study. A summary of all the hypotheses along with the results indicating their acceptance or rejection is provided in Appendix B at the end of this thesis.

Chapter Seven includes further analyses, namely, sensitivity and robustness tests to examine the stability and acceptability of the main results. Hopefully, this provides additional exploratory findings to supplement those in Chapter Six. Finally, Chapter Eight summarises all the major implications and conclusions of this study: this includes the findings from the main analysis, as well as those from the sensitivity and robustness analyses. The final chapter also discusses the specific contributions of this study following which the study's limitations and suggestions for future research prospects are presented.

Chapter Two: Literature Review

2.1 Overview of the Chapter

Chapter One provided a brief overview of this study including the study's background and motivations, objectives, significance and limitations.

This chapter provides a comprehensive review of the prior literature on the study's components. Firstly, a detailed discussion is presented on the internal audit function (IAF) along with the regulatory and institutional changes on internal audit worldwide. This is followed by a literature review on outsourcing in which its motivation, types and regulatory aspects are discussed separately. This chapter also provides information on two key corporate governance mechanisms (i.e., the AC and BOD) and internal audit quality, all of which are associated with the adoption of internal audit and outsourcing practices. Subsequently, the empirical literature on the factors influencing earnings management is provided. This comprises information on the association of earnings management with internal audit and on various approaches including models for detecting earnings management. The chapter concludes with a summary.

2.2 Internal Audit

2.2.1 Definition

The emphasis on internal audit has increased distinctly since 2001 in the aftermath of large corporate failures. The definition of internal audit has been consistent with the focus on the changing business environment.

In 1947, the Statement of Responsibilities of Internal Audit defined internal audit as: "... an independent appraisal function established within an organization to examine and evaluate its activities as a service to the organization" (Trotman 1983).

This definition describes the primary objective of internal audit as being to assist the members of the organisation to effectively discharge their responsibilities (Bou-Raad 2000). Traditionally, internal audit is considered as an independent appraisal function to evaluate the correctness of financial transactions' services to the organisation (Ahlawat and Lowe 2004).

The Elliott Report (AICPA 1996) recognises that beyond the traditional role of financial and compliance audit, internal audit needs to diversify its scope to include assurance and consulting-based services. The new vision of the value-added and consulting services of internal audit has been in practice for some years and this expanded vision reflects the existing practices of the internal audit function (IAF).

The Institute of Internal Auditors (IIA) defines internal auditing as:

... an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes (IIA 1999).

This definition expanded the role of internal audit which thus evolved from a narrow traditional focus on financial and operational audit to a broader value-added role through which to provide assurance and consulting services thus improving internal control and risk management (Krogstad, Ridley and Rittenberg 1999; Brody and Lowe 2000b; Walker, Shenkir and Barton 2003a). Internal audit has shifted its emphasis from accountability to improving control, risk management and corporate governance so they can operate effectively and efficiently (Stern 1994; Nagy and Cenker 2002; Goodwin 2004; Goodwin-Stewart and Kent 2006; Mihret and Yismaw 2007). This new definition of internal audit thus refers to internal audit having broad business and technical skills as well as objectively and independently providing assurance and consulting services (Ahlawat and Lowe 2004; Brody and Lowe 2000). Here, assurance implies the rendering of services in an objective examination of the evidence to provide an independent assessment of the risk management, control or governance processes of the organisation (IIA 2001). Consulting implies the development of a close working relationship with management and the facilitation of decision making to improve the true financial reporting circumstances (DeZoort, Houston and Peters 2001b). Internal audit judgments thus reflect an “unbiased assessment of the circumstances” (IIA 1999).

Owing to the extended role of internal audit, it has been promoted as a cornerstone of effective corporate governance (IIA Professional Guidance 2002). Today's organisations

demand more concern for risk management, governance and control through internal audit with these activities emphasised in the new definition (Parkinson 1999). Academics and practitioners also support the extended role of internal audit that is emphasised in this definition.

2.2.2 Changing nature of internal audit work

The internal audit function (IAF) has changed markedly in the past few decades from a narrow focus on evaluating and strengthening internal controls (Cohen, Krishnamoorthy and Wright 2004; Gramling et al. 2004a). This function has evolved from the traditional ‘watchdog of controls’, that is, measuring and evaluating the effectiveness of internal controls (a narrow focus) to a value-added business function which has created a broader spectrum of activities and, thus, opportunities for the profession to re-examine its role in the light of an increasingly competitive marketplace (Chapman and U.Anderson 2002; Aldhizer Iii, Cashell and Martin 2003; Sharma and Subramaniam 2005; Selim, Woodward and Allegrini 2009). Internal audit is now providing services in risk management, control and governance mechanisms (Walker, Shenkir and Barton 2003b; Brody and Lowe 2000a) and adding continuous value through identification and prevention of potential risk (Auditwire 2000). Internal audit is not only working on problems but is also working with management to recommend solutions (Rittenberg 2000).

In particular, the internal audit function (IAF) is involved with:

- **Risk management:** Internal audit provides assurance services by identifying, evaluating and managing the risk factors and takes a key role in risk management processes (Leithhead 1999; Walker, Shenkir and Barton 2003b). Lindow and Race (2002) also state that the responsibility of internal audit is to monitor the risk profile and identify areas of improvement for the company. Internal audit is involved in ensuring that adequate controls are in place to manage business risk and the risk associated with fraudulent financial reporting (Goodwin-Stewart and Kent 2006).

Therefore, internal audit plays a key role in enterprise risk

- **Control mechanism:** Auditing standards (ISA 400; AUS 402) state that the ability of an effective internal audit function (IAF) is to significantly strengthen the control mechanism. A sound internal control environment helps to provide reasonable assurance that the objectives of the organisation are achieved in regard to operations, financial reporting and compliance with regulations (Bou-Raad 2000). Therefore, the value-added services of internal audit contribute to an effective control structure that improves the quality of information for decision-making purposes.
- **Internal governance mechanism:** Internal audit acts as a complementary mechanism for governance processes. The Institute of Internal Auditors' (IIA) statements (IIA 1999, 2004) describe that the role of internal audit is to evaluate and improve governance processes (e.g., BOD, AC and external audit). Recent research studies (Ramamoorti 2003; Ruud 2003) provide similar views when they state that internal audit improves the governance process in association with the BOD and AC and promotes and supports effective organisational governance.

2.2.3 Importance as an arm of good corporate governance

Internal auditing has gained significant attention as an integral component of the corporate governance mosaic particularly since the turn of the current millennium. Following corporate scandals and the Global Financial Crisis, regulators and the public are showing increasing interest in disclosure requirements relating to corporate governance to ensure better internal assurance (Soh and Martinov-Bennie 2011). Over recent years, internal audit has been established in a growing number of organisations (Arena and Azzone 2007), has expanded its role (Spira and Page 2003; Carcello, Hermanson and Raghunandan 2005b) and has increased its size (Ernst & Young 2007). The wider brief of internal audit includes the support of organisational governance mechanisms and the evaluation and improvement of risk management and control (IIA 1999). Earlier studies also highlight that the importance of internal audit is to contribute to quality corporate governance, improvement in the control and monitoring environment, and the mitigation of potential risk (Beasley et al. 2000; Coram,

Ferguson and Moroney 2008). Internal audit is therefore in a unique position within the organisation to add value in an independent and objective manner (Carcello, Hermanson and Raghunandan 2005; Carey, Simnett and Tanewski 2000; Brody and Lowe 2000). To accomplish this value-adding role, internal auditors need to be capable of logical thinking; possess business-related skills, and display research ability and, importantly, flexibility. In addition, internal auditors need specific technical skills and continual professional development to keep up to date with changing business practices and to remain capable of providing value-added services (Bou-Raad 2000).

Internal audit information is not publicly available which impedes empirical research. For this reason, researchers need to use surveys as a means of collecting data. Few studies have examined the factors associated with the existence of an internal audit function (IAF) (Wallace and Kreutzfeldt 1991; Carey, Simnett and Tanewski 2000; Goodwin-Stewart and Kent 2006). Wallace and Kreutzfeldt (1991), using US data for their study, report that companies with an internal audit department are likely to be significantly larger; highly regulated; more competitive, profitable and liquid; more conservative in terms of accounting policies; more competent in their management and accounting personnel; and to exhibit better management control. Carey, Simnett and Tanewski (2000), using data from Australian family-owned businesses, report that 59% of family-owned companies in Australia voluntarily employ internal audit mechanisms and that the presence of these mechanisms is not associated with firm size or debt. An Australian study conducted later by Goodwin-Stewart and Kent (2006a), using year 2000 ASX-listed firm data, examined the use of internal audit by listed companies and reported that only one-third of the sample used internal audit and that its existence was positively associated with firm size and a commitment to risk management. Using data from the financial year of 2000, Goodwin-Stewart and Kent (2006) found weak support for an association between corporate governance and internal audit. This current study contributes to the internal audit literature by examining the association between the existence of the internal audit function (IAF) and two important corporate governance mechanisms

(namely, an effective AC and an effective BOD) for the recent financial year of 2011 in the top ASX-listed companies.

A few other studies examine the factors related to internal audit size. For example, Carcello, Hermanson and Raghunandan (2005) investigate the factors associated with US companies' internal audit size with this measured by their internal audit function (IAF) budget. They conclude that company size, leverage, being either financial services or utility industries, relative amount of inventory, operating cash flows and the audit committee (AC) review of the internal audit budget are positively related to the internal audit budget. Carcello, Hermanson and Raghunandan (2005) and Goodwin-Stewart and Kent (2006) measure internal audit function (IAF) size in a similar way in terms of the absolute size based on the number of internal audit staff using US and Australian data, respectively. Both studies report that firms' financial resources, size, number of business segments, use of a Big 5 auditor, proportion of receivables and inventory, leverage and number of audit committee (AC) meetings are related to internal audit size. Sarens and Abdolmohammadi (2011) apply data from Belgium using the relative size of the internal audit function (IAF) (e.g., the number of internal audit staff as a percentage of the total number of employees) instead of the absolute size and find that firm size, ownership structure and the number of reporting levels are significant determinants of internal audit function (IAF) size. More recently, Anderson et al. (2012) investigate the factors associated with the size of the internal audit function (IAF) in US public and private companies in the contemporary post-Sarbanes–Oxley Act (SOX) period. Their study finds that some audit committee (AC) and internal audit characteristics, internal audit activities performed by others and organisational characteristics are related to the size of the internal audit function (IAF). Some studies worked on different issues in relation to internal audit. For example, Goodwin (2004) explores the nature of the internal audit function (IAF) in public and private sectors in Australia and New Zealand (NZ) and suggests that, although there are similarities in terms of internal audit activities and interaction with external auditors, the nature of internal audit is different between the two sectors. Furthermore, Christopher, Sarens and Leung (2009)

critically analyse the independence of the internal audit function (IAF) through its association with management and the audit committee (AC).

The internal audit function (IAF) has expanded its opportunities by effectively managing a diverse array of risk ensuring better corporate governance (Birkett et al., 1999). After various financial reporting scandals and subsequent legislative and professional responses to these scandals (Carey, Subramaniam and Ching 2006), the ASX Corporate Governance Council (CGC) (2003) and the Sarbanes–Oxley Act 2002 highlight internal audit as a key resource for the company to gain advice on internal control and risk management. Coram, Ferguson, and Moroney (2008), after investigating the role of internal audit, reported in terms of its role in detecting and reporting fraud that is occurring through the misappropriation of assets in organisations. Birkett et al. (1999) survey internal auditors in Australia and similarly report that fraud detection is part of the internal audit function (IAF). The standards AUS 210 (Australian Accounting Research Foundation 2004) and later ASA 240 (Auditing and Assurance Standards Board 2006) emphasise the duties of internal audit in detecting fraud and raising the awareness of fraud. (Nestor 2004) emphasises internal audit as an important governance tool to protect corporations from internal criminal behaviour. However, when Davidson, Goodwin-Stewart and Kent (2005), using data from Australian-listed companies, investigate the effect of internal governance mechanisms on earnings management, they report that the voluntary establishment of internal audit, as an internal governance mechanism, is not associated with earnings management. Hala (2003), in reference to former Enron Vice President, Sherron Watkins, reports that internal audit detects undue pressure from senior management to meet target arrangements and achieve financial rewards and thus helps to mitigate earnings management. Eighme and Cashell (2002) also highlight that the role of internal audit in detecting earnings management is complementary to that of external audit in contributing to better corporate governance. Furthermore, Clikeman (2003) added that, other than detecting earnings management, internal audit should take a proactive approach to educate managers and directors about the risks associated with earnings

management. Internal auditors therefore need to be ethically sensitive and foster the truthfulness of financial reporting and hence support corporate governance quality. The Institute of Internal Auditors' (IIA) Practice Advisory 1130-1 also highlights the role of internal audit in maintaining an ethical culture by detecting the misappropriation of an organisation's assets (IIA 2004). This study will contribute to the earnings management literature by examining the association of the existence of the internal audit function (IAF) and internal audit outsourcing (IAO) with earnings management for the recent financial year of 2011 in the top ASX-listed companies.

2.3 Institutional and Regulatory Environment

Regulatory reforms and professional announcements on internal audit around the world have increased since 2001, after large corporate failures such as Enron and WorldCom. Regulators agree on the need to strengthen the role of internal audit as an integral part of the governance and internal control process of a company (SEC 2002, 2004). Several studies (Gramling et al. 2004a; Carcello, Hermanson and Raghunandan 2005b; Sarens and De Beelde 2006; Cohen, Krishnamoorthy and Wright 2010) have reported significant changes in the role of internal audit. In consideration of these significant changes, regulators in the USA, United Kingdom (UK) and Australia have implemented regulations to ensure internal audit effectiveness within the context of corporate governance (Soh and Martinov-Bennie 2011). For example, the Sarbanes–Oxley Act (SOX), New York Stock Exchange (NYSE), the Securities and Exchange Commission (SEC 2002, 2004), National Association of Securities Dealers Automated Quotations (NASDAQ) Stock Exchange, Australian Securities Exchange (ASX) and ASX Corporate Governance Council (CGC) all emphasise that companies should maintain an effective internal audit function (IAF).

In the USA, the National Commission on Fraudulent Financial Reporting has recommended that all companies should maintain an effective internal audit function (IAF) (Treadway 1987). The Sarbanes–Oxley Act (SOX) (2002) greatly emphasised the need for internal controls over the financial reporting of a company. Furthermore, former SEC Chief

Accountant, Robert Herdman stated the significance of internal audit in stemming fraud and abuse and in the preparation of true and fair financial statements thus influencing corporate success (Herdman 2002). The New York Stock Exchange (NYSE) later mandated that all listed companies have internal audit functions (IAFs) (SEC 2003) to ensure the management of internal controls. Consequently, Rule 303A.07 (d) in the Listed Company Manual (effective October 2004) states that “listed companies must maintain an internal audit function to provide management and the audit committee with ongoing assessments of the company’s risk management processes and system of internal control”. The Securities and Exchange Commission (SEC) (2002, 2004) has encouraged companies to have internal audit departments that support corporate governance and enhance investor protection. According to the regulations on internal audit, the Public Company Accounting Oversight Board (PCAOB) has reported that organisations gain complementary benefits by investing in competent and objective internal audit functions (IAFs) (PCAOB 2004). The NASDAQ Stock Exchange does not require listed companies to have an IAF, but encourages it as best practice (Harrington 2004).

In Australia, the Corporations Act and the Australian Securities Exchange (ASX) Listing Rules have strongly emphasised the importance of good corporate governance (Coram, Ferguson and Moroney 2008). This emphasis by the regulators has enhanced the importance of internal audit as a cornerstone of corporate governance in the Australian environment. Carey, Simnett, and Tanewski (2000) reported that 41% of Australian family-owned companies have not established internal audit functions (IAFs). In addition, Goodwin-Stewart and Kent (2006a) estimated that two-thirds of Australian publicly-listed companies in the year 2000 did not have any internal audit function (IAF). As the establishment of an IAF is not mandatory in Australia, it appears that many companies have not established internal audit functions (IAFs).

The ASX CGC was formed in 2002 tasked with the object of producing “Corporate Governance Principles and Recommendations” (CGP&R) that would be underpinned by the

ASX Listing Rules. In the period following its inauguration, the CGC released two editions of its Principles and Recommendations as well as minor amendments in 2010. A third edition was released in March 2014 following consultations with various bodies. Principle 7 in all editions deals with governance issues associated with the recognition and management of risk: any references to the use of an IAF are included therein. Given the CGC's non-prescriptive and flexible "if not, why not" disclosure approach (CGP&R, 2nd edn. 2007), it is worth noting how its interest in the role of internal audit has altered following the recently witnessed decade of social and economic changes. The CGC approach (2007) allows flexibility in that it permits companies the discretion of not following a particular recommendation if they consider it inappropriate. The recommendations are meant to encourage firms to review their governance requirements in light of their value to the organisation.

Under ASX Listing Rule 4.10.3, companies are still required to give reasons for non-compliance in their annual reports. Recommendation 7.1 in the first edition of the CGP&R provided commentary and guidance indicating that the effectiveness of risk management and internal controls is generally determined by an IAF and that large firms ought to consider the use of IAFs in this connection. Further information about the role of internal audit, including the need to provide for separate lines of reporting to management and the board (or its relevant committee), are provided in the commentary. In the second edition of the CGP&R, risk management receives particular emphasis in Recommendations 7.1 and 2, while reference to internal audit is again relegated to the commentary. Risk management policies ought to cover all necessary issues, including 'any' internal audit function (IAF) (p. 32). Recommendation 7.2 is followed by a commentary that suggests that a company should consider having an internal audit (p. 33). On 13 August 2013, the ASX CGC released its draft third edition for consultation in the status of the reference to internal audit is raised by its inclusion as part of Recommendation 7.3, wherein the ASX suggests that firms disclose how the function is structured and what role it performs. However, in the introduction to Principle 7, the draft CGP&R affirms that different listed entities (e.g., small firms) might legitimately apply

different governance practices. Evidence is emerging from the changes to the CGP&R as described above that listed firms are emphasising the establishment and practices of an independent internal audit function (IAF).

2.4 Internal Audit Outsourcing

2.4.1 Definition

Outsourcing is described as a contract with an external party (e.g., accounting firm) to provide services that could otherwise be provided by an internal source (Carey, Subramaniam and Ching 2006). Selim and Yiannakas (2000) define outsourcing as the practice whereby a firm is contracted to perform one or more business activities that traditionally have been performed inside the organisation. Although internal audit activities have been traditionally performed in-house, the emphasis on outsourcing internal audit activities is increasing (Rittenberg, Moore and Covaleski 1999; Martin and Lavine 2000). Internal audit outsourcing (IAO) is a common phenomenon in today's business world. It provides flexibility in that organisations can choose to use their own staff (in-house), or use an external firm (outsource), or a combination of the two to perform the necessary function (Coram, Ferguson and Moroney 2008). Outsourcing does not necessarily involve replacing the internal auditors. Firms may also prefer to use agencies to conduct specialised functions rather than setting up these functions in-house. The IIA (2009) recognises outsourcing as an effective way to accomplish internal audit activities that contribute to management's strategic objectives. Outsourcing is the consequence of a strategic response to growing competitiveness. Similarly, Richard (Anderson 1996) in a marketing brochure stated that internal audit outsourcing (IAO) is a strategic concept performed to add value to the business by converting an in-house cost centre into a customer-focused services operation. Quinn and Hilmer (1995), Jennings (1996) and Hinton (1996) suggest that organisations should invest in core competencies to ensure future competitiveness and should outsource non-core or non-routine functions as their accomplishment demands special capabilities.

2.4.2 Effect of regulation on outsourcing

Section 201 of the Sarbanes–Oxley Act (SOX) (2002) prohibits outsourcing of the internal audit function (IAF) due to the impairment of audit independence and its associated services related to internal control, financial systems or financial statements. The IIA (2009) states that, in order to achieve business objectives, internal audit should be performed by competent professionals in conformance with the International Standards for the Professional Practice of Internal Auditing (Standards) as promulgated by the Institute. The Code of Ethics for Professional Accountants (APES 110) also states that a self-review threat may be created by outsourcing internal audit services to contracted external auditors. Here it is worth noting that to safeguard against this threat, the external auditor should not be involved with routine internal audit activities, such as compliance, or financial and normal operational audits. In addition, non-assurance or non-routine services should not be provided by the same personnel involved in the assurance engagement. Accordingly, the Australian Securities Exchange (ASX) Corporate Governance Principles and Recommendations (CGP&R) (2007) also state that internal audit should be independent of the external auditor. Companies may depart from the recommendation if there is a perceived benefit from outsourcing internal audit activities to the external auditor; however, it is necessary for listed firms to declare their reasons for departing from these recommendations. Unlike the Sarbanes–Oxley Act (SOX) (2002), in Australia, there is no restriction on outsourcing internal audit to the external auditor of the client firm.

2.4.3 Evidence of outsourcing

Over the last two decades, the internal audit function (IAF) has emerged as a lucrative market for public practice firms (IIA 1998; Rittenberg and Covaleski 2001). Due to outsourcing, the accounting services industry is facing important challenges to provide value-added services (Carey, Subramaniam and Ching 2006). Earlier research (Mathews, Cooper and Leung 1993; Rittenberg and Covaleski 1997; Rittenberg, Moore and Covaleski 1999; Carey, Simnett and Tanewski 2000; Martin and Lavine 2000; Selim and Yiannakas 2000;

Subramaniam, NG and Carey 2004) highlights a substantial increasing trend in internal audit outsourcing (IAO) in Australia and abroad. The outsourcing of services started to get more attention in the USA since the 1990s (Petravick 1997). At that time, (Corbett 1998) reported the generally increasing trend of outsourcing, stating that 85% of organisations in the USA prefer outsourcing to in-house services. A survey conducted by IIA (2009) reported that 48% of respondents (and 61% of Fortune 500 respondents) use third parties to perform internal audit activities. Martin and Lavine (2000) conducted a survey on internal audit directors in North America and reported that 25% of US organisations and 31.5% of Canadian organisations outsource their internal audit function (IAF). Later, Selim and Yiannakas (2000) investigated the public and private sectors in the UK and concluded that 62.5% of these sectors, in total, outsource their internal audit function (IAF). Empirical research on the practice of internal audit outsourcing (IAO) is limited in Australia. Mathews , Cooper and Leung (1993), in their survey of Chief Executive Officers (CEOs) and internal audit managers in Australian firms, concluded that 50% of the respondents reported having outsourced the entire IAF whereas 53% of respondents indicated that their firms contracted services from their external auditor. Carey, Simnett and Tanewski (2000) investigated the voluntary demand for internal auditing from family businesses in Australia and reported that outsourcing was a common method of providing internal audit services at that time. Subramaniam, Chew, and Carey (2004) later investigated internal audit outsourcing (IAO) practices of Queensland public sector agencies. They suggested that outsourcing is a common practice with 51% of agencies co-sourcing and 37% of agencies fully outsourcing to gain technical expertise and better service quality. These studies investigate the recent trend of internal audit outsourcing (IAO) in Australia and report on the corporate governance mechanisms that are associated with the decisions to outsource.

2.4.4 Benefits and drawbacks of outsourcing

There appears to be an ongoing debate about the benefits and drawbacks of internal audit outsourcing. The Institute of Internal Auditors (IIA 1994, 1996) argue that specific types

of internal audit outsourcing can be beneficial and cost-effective and helps to improve internal audit quality. Earlier researches (Crawford, Mathews and Cooper 1996; Shapoff 1999; Selim and Yiannakas 2000; Rittenberg and Covaleski 2001; Abbott et al. 2003a; Carey, Subramaniam and Ching 2006) mention some of the common benefits of outsourcing to external providers. For example, the benefits of outsourcing which result in improved organisational performance include: obtaining high quality services through the expert knowledge and technological specialisation of the external auditor; having the potential to provide cost savings particularly in the short term; having access to the leading practices; and having international and wider cultural coverage. Furthermore, McCune (1993) and Marshall (1994) argue that outsourcing can provide the opportunity to quickly respond to changing market conditions to take advantage of new opportunities. An external service provider with specialised knowledge can be hired relatively quickly for a specific specialised project thus providing flexibility and cost minimisation and obtaining expertise, knowledge and services (Rittenberg and Covaleski 2001). Internal audit services provided by external service providers also help to avoid hiring permanent staff which would thus incur extra administrative costs.

Some researchers advocate the employment of an in-house internal audit function (IAF) as a better option. The in-house IAF has the advantage over external providers through its in-depth firm-specific knowledge and a solid commitment to value-added services and the long-term well-being of the organisation (Rittenberg and Covaleski 1997; Martin and Lavine 2000; Rittenberg and Covaleski 2001; Smith 2002; Carey, Subramaniam and Ching 2006). In addition, (Martin and Lavine 2000; Verschoor 1992) support in-house IAFs because external providers may lack commitment and demonstrate a tendency to engage in opportunistic behaviour. Selim and Yiannakas (2000) contributed some additional points stating that in-house internal auditors provide a better quality of services, constructive assistance and availability of resources.

Discussion on the advantages and disadvantages of internal audit outsourcing (IAO) provides an arguable rationale for outsourcing services to external providers. The earlier

literature (e.g., Subramaniam, Chew, and Carey 2004; Sharma and Subramaniam 2005; Selim and Yiannakas 2000; Caplan and Kirschenheiter 2000; Petravick 1997) states that the key justifications of outsourcing are receiving higher quality services from external providers, cost minimisation and reduction of surplus audit work. Moreover, the choice of an in-house versus an outsourced IAF is associated with the frequency of internal audit activity. Companies that outsource their IAF tend to have low asset specificity, low environmental and behavioural uncertainty, and a lesser need to use the internal audit function (IAF) (Widener and Selto 1999; Spekler, Elten and Kruis 2007). To a greater extent, external auditors rely on outsourced internal audit rather than work performed in-house in cases where there is a high level of inherent risk in a company. Carey et al. (2006) examined the extent as well as the determinants of internal audit outsourcing (IAO) by ASX-listed companies. Their study reports that cost savings and technical competence are important determinants of outsourcing decisions, while firm size is not likely to be associated with outsourcing.

2.4.5 What internal audit activities are best outsourced?

Peter F. Drucker (1995, pg. 3) outlined his vision of outsourcing in the *Wall Street Journal* as: “in another 10 to 15 years, organizations may be outsourcing all work that is “support” rather than revenue producing, and all activities that do not provide career opportunities into senior management”.

It is apparent that Peter Drucker’s vision is materialising. The extent of the outsourcing of internal audit is accelerating year after year and has a long-lasting effect on organisational performance (Selim and Yiannakas 2000). Therefore, organisations are faced with a major and difficult concern when choosing which IAF to outsource (Selim and Yiannakas 2000). Pelfrey and Peacock (1995) categorised the specific types of outsourcing as routine or non-routine internal audit functions (IAFs). As a core function, recurring internal audits are the centre of an entity’s future success (Selim and Yiannakas 2000) and provide a competitive advantage if applied appropriately. Prahalad and Hamel (1990) maintain that outsourcing can seriously diminish organisational competitiveness if the routine (e.g., core) IAF is not nurtured and

protected over time. In support of this, Bettis, Bradley and Hamel (1992) suggest the proper selection of IAFs to outsource should be undertaken to avoid competitive decline. Non-routine internal audit activities where agencies with specialised knowledge are accessed as required to deal with specific issues may involve less economic bonding (Beck et al. 1988). The outsourcing of non-routine internal audit activities to external providers other than a company's own external auditor significantly improves audit coverage and internal audit quality (Abbott et al. 2007). Therefore, the motivation for internal audit outsourcing (IAO) is subject to decisions about what internal audit activities are outsourced, to what extent and to whom. As mentioned, outsourcing to contracted external auditors is not allowed in Australia as auditor objectivity is more likely to be compromised (Abbott et al. 2007).

2.5 Internal Audit and Corporate Governance

A system of corporate governance is necessary in many organisations due to the separation of ownership and control (resulting in agency problems) in the modern business world. This separation of ownership and control reduces agency costs by supervising management activities and thereby aligning the interests of management with those of shareholders and investors.

There are various definitions of corporate governance. For example, Messier, Glove and Prawitt (2008) define corporate governance as a system “consisting of all the people, processes and activities to help ensure stewardship over an entity’s assets”. A good corporate governance structure helps to ensure that management properly utilises the enterprise’s resources in the best interests of absentee owners, and fairly reports the financial condition and operating performance of the enterprise.

Corporate governance includes the procedures and activities employed by the representatives of an organisation’s stakeholders to supervise management’s risk and control processes (Gramling et al. 2004b). The organisation’s stakeholders include present and potential investors, employees and creditors. The primary representatives of the organisation’s stakeholders are considered to be the four cornerstones of corporate governance comprising

the audit committee (AC) of the board of directors (BOD), executive management, the external auditors and the internal audit function (IAF). These four cornerstones have direct and immediate impact on corporate governance within a specific organisation. The IAF is described as the window of the whole company (Tapestry Networks 2004) through which the actions of the other three parties are facilitated. With accessibility throughout the whole organisation, internal audit is in a unique position to serve as a valued resource to the other three parties of corporate governance (Gramling et al. 2004b).

Since the 1940s, the IAF has played a diversified corporate governance role in many organisations (Gramling et al. 2004b), generally performing risk assessment, control assurance and compliance work facilitating corporate governance (Hermanson and Rittenberg 2003). Bailey Jr. et al. (2003) investigated the importance of internal audit stating, in response to corporate scandals, that internal audit can provide solutions to the perceived control, reporting and ethical problems in the business entity. The expanding services of internal audit can effectively manage a diverse array of risks (Birkett et al. 1999). Following the financial scandals of the past decade, various legislative and professional bodies have identified internal audit as a key resource for company management and directors in the pursuit of good internal controls and risk management (ASX 2003; SOX 2002). Maintaining the quality of internal audit services is therefore a critical component in fostering a sound corporate governance system (Carey, Subramaniam and Ching 2006).

In addition to internal audit, there are two important corporate governance mechanisms, that is, the audit committee (AC) and the board of directors (BOD) (Raghunandan, Read and Rama 2001; Abbott et al. 2007; Davidson, Goodwin-Stewart and Kent 2005; Cohen, Krishnamoorthy and Wright 2002). The independent monitoring role of internal audit provides a ready and available source of assistance to the audit committee (AC) and/or the board of directors (BOD). Making decisions about the presence of internal audit, the choice to outsource and the extent of outsourcing, amongst the other objectives of the AC and the BOD, may represent a function of the effectiveness of these bodies.

2.5.1 Effective audit committee

Urbancic (1996b) suggests that the prominent roles of the AC are in evaluating audit scope, the firm's use of the internal and external auditors and reviewing the adequacy of the firm's internal control structure. The Treadway Commission (1987) clarified the vital role of the AC in establishing the firm's control environment and corporate governance structure. In response to the Treadway Commission's recommendations, the (IIA 1993) stated that the goals of the AC and internal auditing are closely interrelated. The ability of the AC to work with internal auditing significantly influences its effectiveness in fulfilling its responsibility to the BOD, shareholders and external parties. In addition, a prime responsibility of the AC is the oversight of the firm's financial reporting process (Klein 2002a). (Klein 2002b) added that the AC should meet regularly with the firm's external auditors and internal financial managers to review the corporation's financial statements, audit process and accounting controls.

The importance of the AC resulted in amendment of the ASX's Listing Rules in 2003 to require any company that was included in the Standard and Poor (S&P)'s 500/ASX All Ordinaries Index at the beginning of its financial year to have an AC during that year. In addition, in March 2003, the ASX CGC released its best practice guide that recommends that all companies have an audit committee (AC) (ASX 2003). The Australian Government's *Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004* (CLERP 9) (Commonwealth of Australia 2004) also mandated the requirement for the top 500 ASX-listed companies to have an audit committee (AC).

An effective AC is an essential corporate governance mechanism. Regulators worldwide strongly emphasise the need for listed companies to establish an effective audit committee (AC) (Goodwin 2003). Since the composition of the AC is important to determine its effectiveness, regulators (SEC 1999; SOX 2002; DeZoort et al. 2002) place more emphasis on what constitutes an effective audit committee (AC). There is, however, no consensus about what constitutes AC effectiveness. In this current study, in structural terms, an effective AC may be described as a committee comprising the following three characteristics, namely: the

percentage of independent directors; having at least four meetings per annum; and employing at least one director possessing financial (including accounting and non-accounting) expertise (Abbott et al. 2007). Audit committee (AC) effectiveness (i.e., AC independence, expertise and number of meetings per annum) facilitate the execution of its duties (DeZoort et al. 2002). Likewise, Lary and Taylor (2012) measure AC effectiveness by the characteristics of independence, competency and diligence. They measure AC independence as the percentage of committee members who formally declared they met ASX independence criteria; AC competency as a composite of the financial sophistication and industry sophistication of committee members; and AC diligence as a composite of the meeting frequency and membership size of the AC. Kalbers and Fogarty (1993b) state that AC effectiveness is a function of the sub-committee's power and authority over the monitoring of financial reporting practices and the external and internal auditing processes. In this context, AC independence and diligence influence the committee's willingness to perform its duties, and AC expertise is posited as impacting on the committee's ability to perform its governance role.

Independent AC members are entrusted to be more objective in the discharge of their responsibilities because they do not have an economic and/or psychological connection with management (Carcello and Neal 2000, 2003; Abbott et al. 2003a; Abbott and Parker 2000). Therefore, an AC comprised entirely, or having a majority, of independent directors helps to improve the quality of financial reporting (Klein 2002a; Xie, Davidson and DaDalt 2003). Independent AC directors earn high reputations in the marketplace and provide confidence that financial mismanagement is avoided (Srinivasan 2005; Beasley 1996; Fama and Jensen 1983b; Reinstein, J. Callaghan and L. Braiotta Jr. 1984). Empirical research also shows that independent AC members work to support the external audit function (Abbott and Parker 2000; Abbott et al. 2007; Carcello and Neal 2000) and thereby improve the overall corporate governance practices within firms (Beasley and Salterio 2001; Klein 2002a; Chen and Zhou 2007).

The financial expertise of AC members has also gained attention in more recent corporate governance regulations (ASX CGC 2010). The Blue Ribbon Committee (BRC) of the American Bar Association (1999) has recommended that the AC have at least one member whose primary background is in finance or accounting. An AC member with financial expertise fulfils the primary responsibility of overseeing the financial reporting process to ensure high quality in the firm's financial reporting (McMullen and Raghunandan 1996; Balsam, Krishnan and Yang 2003). Financial experts provide an understanding of audit risk and communication with internal and external audit functions regarding control weaknesses and audit coverage (McDaniel, Martin and Maines 2002; DeZoort and Salterio 2001a).

The number of AC meetings per annum is an indication of the committee's diligence and motivation to perform its duties (Menon and Williams 1994; Kalbers and Fogarty 1993b). Abbott, Parker and Peters (2004) found that ACs that meet at least four times annually are more likely to have knowledge about accounting and audit issues. This level of diligence is more likely to ensure that members gain knowledge of accounting and audit issues allowing them to more effectively review and approve internal audit's plans and budgets (Raghunandan, Rama and Scarbrough 1998). Therefore, the more often a committee meets, the more likely it is to carry out its responsibility (Davidson, Goodwin-Stewart and Kent 2005).

The association of effective AC and IAF is important in better corporate governance processes and financial reporting (NACD 1999; SEC 1999; 2002, 2004). The American Bar Association's Blue Ribbon Committee (BRC) (1999) mentioned that the responsibilities of the AC are to monitor and have oversight of the entire audit processes, including internal audit activities. To successfully perform their responsibilities, an effective audit committee (AC) relies on internal audit in order to have assurance recording controls, independent evaluation of accounting practices and processes, risk analysis, fraud analysis and special investigations (Anderson et al. 2012; Hermanson and Rittenberg 2003). Therefore, the AC should monitor the IAF and have influence over the financial resources available to the internal audit function (IAF) (Carcello, Hermanson and Neal 2002; Carcello, Hermanson and Raghunandan 2005b;

Barua, Rama and Sharma 2010). The prior literature also suggests that internal audit should play an effective role in corporate governance in association with other corporate governance mechanisms (e.g., the AC and management) (Raghunandan, Read and Rama 2001; Goodwin 2003; Ratcliffe 2009). Furthermore, three components (i.e., independence, financial expertise and number of meetings per annum) of AC effectiveness are positively associated with internal and external audit quality (Abbott et al. 2007). Committee independence and diligence act to widen the audit scope and limit the possibility of financial misstatement (Abbott et al. 2003a; Subramaniam, NG and Carey 2004). A primary interest of an effective AC is maximising the independence of internal and external auditors (Abbott et al. 2003a). Various research (Raghunandan, Read and Rama 2001; Raghunandan, Rama and Scarbrough 1998; Scarbrough, Rama and Raghunandan 1998) reports positive associations between AC effectiveness and audit quality influencing sound corporate governance. A lack of independence within the AC diminishes objectivity affecting the quality of the internal audit function (IAF) (Wallace and Kreutzfeldt 1991). Scarbrough, Rama, and Raghunandan (1998) also report that AC effectiveness is associated with internal audit quality.

2.5.2 Effective board of directors

The board of directors (BOD) forms the apex of a firm's internal governance structure and therefore is recognised as an important control mechanism (Fama and Jensen 1983a, 1983b). The BOD is responsible for ensuring the firm's internal control system by investigating whether the IAF is performed correctly and in accordance with professional standards (Badawi et al. 2003). Moreover, the BOD is responsible for ensuring internal audit quality by checking that internal audit duties are performed impartially and without any undue influence. Goodwin-Stewart and Kent (2006) also argue that the BOD needs to develop a risk-based culture within the firm. Consequently, the BOD is responsible for not allowing the outsourcing of activities that could place the firm at greater risk.

Several US regulatory bodies (i.e., the Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation,

and Office of Thrift Supervision) issued an Interagency Policy Statement (IPS) (IPS 2003) which highlighted the importance of the board of directors (BOD) (Badawi et al. 2003). The IPS states that the BOD is responsible for ensuring the efficiency of the IAF which is an element of the firm's internal control system. The statement emphasises a need for reasonable assurance of the BOD: this is so the system of internal control can prevent or detect significant inaccurate, incomplete or unauthorized transactions; deficiencies in the safeguarding of assets; unreliable financial reporting (which includes regulatory reporting); and deviations from laws, regulations and institutional policies. The BOD also needs to investigate and ensure that the firm's internal audit activities are conducted in accordance with professional standards, such as the Institute of Internal Auditors' (IIA) Standards for the Professional Practice of Internal Auditing.

As argued in earlier research (e.g., Badawi et al. 2003; Goodwin-Stewart and Kent 2006a), the ability of a BOD to meet its responsibilities will depend on the BOD's effectiveness. Corporate governance best practices point to three main characteristics of BOD effectiveness: (a) composition, (b) size and (c) duality. An effective BOD is in a position to investigate the validity of accounting records made by management and to analyse the implications of such records (NYSE 2002). As in earlier research (Jensen 1993; Beasley 1996; Kiel and Nicholson 2003; Jackling and Johl 2009), this study uses the BOD's composition, size and duality as components of effectiveness.

Board independence is a component of effective boards of directors (BODs). Regulatory bodies (e.g. NYSE 2002; ASX 2003; Cadbury Report 1992; Standards Australia International 2003; Bosch Committee 1995) suggest that the best composition of the board includes at least a majority of non-executive or independent directors. Board independence refers to the situation where a board is comprised of non-executive directors who have no relationship with the firm beyond the role of director (Davidson, Goodwin-Stewart and Kent 2005). Independent directors have the ability to act as an effective monitoring mechanism and thus reduce the likelihood of fraudulent financial reporting (Beasley 1996). The majority of external directors

are most likely to have a positive impact on firm performance (Fama and Jensen 1983a; Jensen and Meckling 1976). Similarly, Rosenstein and Wyatt (1990) found that the appointment of an external director results in an increase in shareholder wealth. Sharma (2004) reports that a high proportion of independent directors on the board reduces the possibility of fraud.

Expanding the number of directors allows more opportunity to expand the board's knowledge base, skills and group experience (Van den Berghe and Levrau 2004). Using resource dependency theory, it is expected that having more directors with links to the external environment would improve a company's access to various resources and therefore improve corporate governance and firm performance (Jackling and Johl 2009). However, Jensen (1993) suggests that a smaller board improves the board's control. It is more likely that financial statement fraud increases with increasing numbers of board members thus demanding increased monitoring (Beasley 1996). Therefore, a board of appropriate size with a proper balance of skills, knowledge, cost, control and monitoring facilities will help to increase board effectiveness.

The separation of the roles of the chairperson and the Chief Executive Officer (CEO) (i.e., addressing CEO duality) is another aspect of board effectiveness (Davidson, Goodwin-Stewart and Kent 2005). Board duality was a significant contributor to governance failures in corporate giants such as Enron, WorldCom and HIH (Jackling and Johl 2009). Therefore, regulators worldwide (Cadbury Report 1992; ASX 2003; Standards Australia International 2003) have pressured firms to split the roles of chairman and Chief Executive Officer (CEO). Board duality also reduces a board's effectiveness in monitoring and controlling the activities of executives. As a result, conflicts of interest are likely to arise. Adams, Almeida and Ferreira (2005) argue that the ability of a CEO to influence decisions can impact on firm performance. On the basis of agency theory, the separation of the roles of chairman and CEO leads to greater scrutiny of managerial behaviour and better firm performance (Fama and Jensen 1983a). Sharma (2004) similarly reports that CEO duality increases the likelihood of fraud.

2.6 Internal Audit Quality

Internal audit quality is an extensively studied area of the internal audit literature. The emergence of new regulations and authoritative guidance (e.g., AICPA 1991; IIA 2003; AUASB 2009 [Auditing Standard (ASA) 610]) noticeably focuses on the improvement of internal audit quality (IAQ). Internal audit quality (IAQ) is associated with the quality of corporate governance, including reporting, internal control, business ethics and firm performance (Gordon and Smith 1992; Bailey, Gramling and Ramamoorti 2003; Gramling et al. 2004b). The quality of the IAF is associated with each of the three parties with which it principally interacts, namely, the AC of the BOD, management and (to a lesser degree) external audit. It is a corporate governance responsibility to evaluate and ensure internal audit quality (IAQ) (Gramling et al. 2004b). Its value as a resource is primarily dependent upon both the extent to which it is supported by the AC and its operational charter, the benefits of which will be returned in kind and influence its constitution (e.g., as an in-house and/or outsourced function).

2.6.1 Constituents of quality and their practical identifiers

In the USA, guidance is provided by the professional internal and external auditing standard SAS No. 65 with respect to internal audit quality (IAQ) (AICPA 1991). The standard states that IAQ is characterised by three factors: competence (e.g., educational level, certification); objectivity (e.g., reporting relationship, authority for hiring internal auditors); and quality of work performance (e.g., adequacy of audit programs, scope of work performed). Similarly, the IIA (2003) promotes standards of IAQ comprising independence, objectivity, proficiency and due care. The setting of similar standards is applicable in the Australian Auditing Standard (ASA) 610: ‘Considering the Work of Internal Audit’. According to this standard, the external auditor judges the quality (e.g., reliability) of internal audit via such elements as: organisational status, scope of function, technical competence and due professional care.

Prawitt, Smith, and Wood (2009) identify six components of IAQ that, to some degree, encapsulate the qualitative factors described above. They include:

- average work experience of the internal auditors (competence, knowledge)
- percentage of internal auditors who are professionally certified, that is, a certified internal auditor (CIA) or a certified public accountant (CPA) (professional competence)
- amount of time spent in internal audit work during the financial year (independence, objectivity)
- relative weight (importance) of internal audit work on financial audits (scope of essential duties, proficiency)
- reporting relationship of the head of the internal audit function (independence, objectivity)
- size of internal audit function (IAF) relative to its industry (adequacy of coverage).

2.6.2 Explanation of quality

The more competent the internal auditors, the more chance they will have of detecting management bias and financial mismanagement (Prawitt, Smith and Wood 2009). As indicated in the above subsection, SAS No. 65 recommends three factors to evaluate competence, namely, professional experience, professional certification and training (AICPA 1997). With respect to IAQ, competence and knowledge of company operations, processes and procedures are the most important criteria (Clark, Gibbs and Schroeder 1980). Internal audit competence is also associated with training programs and professional certifications in relation to internal audit (Brown 1983). Gramling and Myers (1997) similarly report that the CIA (certified internal auditor) designation, which is a globally accepted professional certification, is a criterion used to evaluate internal audit (IA) competence that leads to high quality internal audit performance. The percentage of professionally certified internal auditors

is inversely related to the risk of fraudulent or misleading financial statements (Prawitt, Sharp and Wood 2012) and is also inversely related to abnormal accruals (Prawitt, Smith and Wood 2009). Messier Jr. and Schneider (1988) also consider the experience of internal auditors as an important indication of competence. Internal auditors with greater experience indicate staffing efficiencies and greater commitment to ensuring internal audit quality (IAQ) (Anderson et al. 2012).

Internal auditor objectivity plays an important role in affecting the quality of a company's financial reporting (Prawitt, Smith and Wood 2009). The standards, SAS No. 65 and ASA 610, require the external auditor to evaluate the objectivity of the internal audit function (IAF) to determine the degree of reliance. Therefore, IIA standards report that the primary aspect of internal audit (IA) objectivity revolves around the reporting status of the head of the IAF, or Chief Audit Executive (CAE), and their direct private access to the audit committee (AC) or board of directors (BOD). Clark et al. (1980), Brown (1983) and Messier Jr. and Schneider (1988) describe the independence (i.e., reporting relationship) of the IAF as the most important criterion for assessing objectivity. Later, DeZoort, Houston, and Peters (2001b) reported that external auditors consider the primary role of the IAF (i.e., auditing or consulting) and compensation structure (i.e., straight salary or an incentive component) as the criterion of IAF objectivity.

The SAS No. 65 also requires the external auditor to evaluate the nature of the work performed by the IAF in terms of its relevance to financial reporting (AICPA 1997). The scope of internal audit revolves around performing financial, operational, fraud detection, compliance, control and internal consulting projects for management (Anderson 1996). Performing financial audits is one of the basic and regular activities of internal audit that helps to maintain financial reporting integrity and contributes to internal audit quality (IAQ). Prawitt, Smith and Wood (2009) therefore use the percentage of internal audit time spent performing financial audits as a proxy for the internal audit focus on performing financial audits. Earlier researchers (Schneider 1984, 1985a, 1985b; Messier and Schneider 1988) tested

the relative importance of these three quality factors, namely, competence, objectivity and work performance. Although there are differences in terms of the relative preferences among these three quality criteria in their studies, each criterion complements the others and they work together to ensure internal audit quality (IAQ).

Furthermore, the Institute of Internal Auditors (IIA) suggests that the IAF is best performed by fully resourced and professionally competent staff who are internal and integral to the management structure of an organisation (Selim and Yiannakas 2000). The IIA (1994) states openly that a competent internal auditing department that is properly organised with trained staff can perform its activities more efficiently and effectively than a contracted audit service. Prawitt, Smith, and Wood (2009) add the criterion of internal audit size (i.e., the overall measure of the entity's investment in the IAF) as an indicator of internal audit quality (IAQ). They report that a well-funded internal audit has greater ability to monitor a company's transactions, thus facilitating the detection and minimisation of management bias.

2.7 Earnings Management and Internal Audit Function

Internal audit is one of the important corporate governance mechanisms, along with the AC, BOD and external audit (IIA 2005a). Internal audit is used to provide assurance and consulting services to improve risk management, control and governance processes (Institute of Internal Auditors (IIA) 1999). Recent scandals involving inappropriate accounting practices (e.g., Enron, WorldCom, HealthSouth, Qwest, Rite Aid, Tyco, Waste Management Inc. and Xerox) have gained the attention of practitioners, regulators and academics regarding the role of internal audit in true and fair financial reporting (Prawitt, Smith and Wood 2009). External auditing standards such as AICPA (1997) and PCAOB (2007a) explicitly recognise the importance of internal audit in the financial reporting process and now require or encourage the existence of an internal audit function (IAF) (Harrington 2004; NYSE 2002). The empirical studies (Rogers and Stocken 2005; Schwartz and Young 2002; Eighme and Cashell 2002; Martin et al. 2002; Rezaee 2002; Clikeman 2003; Hala 2003) have also emphasised the changing nature of internal audit. This emphasis has evolved from controls and operational

risk management to monitoring the practice of reporting true financial information and the performance of the company. Internal audit is likely to accomplish this monitoring responsibility effectively to ensure that earnings have not been manipulated and falsely reported. They also have a duty to encourage good business ethics within management.

Earlier researchers (Rogers and Stocken 2005; Schwartz and Young 2002) reported that management forecasts and communications are more biased in cases where there is no third party to verify misrepresentations. High quality internal auditors work as an additional third party to monitor management actions and detect fraudulent financial reporting (Prawitt, Smith and Wood 2009). Hala (2003) believes that internal audit should oversight management activity and investigates any undue pressure from top management to manipulate earnings in order to achieve targeted earnings and compensation plans. If there is a possibility that management is misreporting financial information, internal auditors extend the budgeted hours to verify the financial reports. Therefore the internal audit function is often primarily responsible to oversee management actions in the process of external financial reporting (Prawitt, Smith and Wood 2009). Internal audit should also be proactive in educating managers and directors of the company about the deleterious outcomes associated with earnings management (Clikeman 2003).

An IAF is expected to facilitate the financial reporting oversight responsibilities of the audit committee (AC) (Scarborough, Rama and Raghunandan 1998; Goodwin and Yeo 2001; Goodwin 2003). Furthermore, Eighme and Cashell (2002) and Schneider and Wilner (1990) identified the role of internal audit in detecting inappropriate earnings management as being complementary to that of external audit. Therefore, internal audit is likely to play an important role in the preparation and disclosure of true and fair financial information as well as acting as a deterrent of false reporting, in particular, earnings management.

2.8 Earnings Management

2.8.1 Definition

There is no common definition of earnings management in the earlier literature. Various definitions have categorised earnings management as a destructive or moderate practice of presenting financial information (Ronen and Yaari 2008). Destructive earnings management implies fraud and misrepresentation of financial reporting (Schipper 1989; Levitt 1998; Healy and Wahlen 1999; Tzur and Yaari 1999; Chtourou, Bedard and Courteau 2001; Miller and Bahnsen 2002). On the other hand, moderate earnings management implies manipulation of earnings within the boundaries of compliance and standards (Fields, Lys and Vincent 2001).

The most used and descriptive definition of earnings management is as follows:

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 economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers. (Healy and Wahlen 1999, p. 368)

Some other popular definitions provided by the regulators and academics are given below:

Earnings management is defined as the practice of distorting the true financial performance of (a) company. (SEC 1999, p. 3)

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

The terms ‘mislead’, ‘distort’ and ‘private gain’ are common in the definitions of earnings management: they emphasise that managers exercise discretion over financial reporting and try to mislead and distort financial information to achieve private gain with a short-term objective at the cost of different stakeholders. Managers very often behave opportunistically and exercise personal judgment to manage reported profits through earnings by the use of discretionary accruals which implies earnings management (Kim, Chung and Firth 2003). Use of management judgment in financial reporting has costs and benefits (Healy

and Wahlen 1999). The costs imply potential misallocation of resources by managing earnings, and the benefits mean improving the credibility of financial information among potential users. In addition, some studies (for example, Ronen and Sadan 1981; Demski et al. 1984; Beneish 2001; Sankar and Subramanyam 2001) have discussed the beneficial aspect of earnings management which is viewed as enhancing the transparency of reporting. Moreover, earnings management can improve the information content and signal financial information about future performance to users (Healy and Wahlen 1999; Dechow and Skinner 2000). Therefore, incentives are viewed as the reason for which managers present misinformation and manage earnings. However, generally, stakeholders regard earnings management in a negative sense as fraud.

Management has the choice to exercise a certain degree of discretion or flexibility in the application of accounting principles within the arena of generally accepted accounting principles (GAAP). If exercising the accounting principles is likely to violate the GAAP, it is considered as fraudulent accounting. In other words, if aggressive earnings management crosses the limit of the flexibility of GAAP, it becomes fraud (Mulford and Comiskey 2002).

The accounting literature has defined earnings management and fraudulent financial reporting (fraud) as subsets of earnings manipulation (Dechow, R. Sloan and A. Sweeney 1995) with both terms referring to the techniques deliberately exercised by managers to show a desired level of reported earnings. As management has the choice to exercise a certain degree of discretion or flexibility in the application of accounting principles within the arena of GAAP, exercising the accounting principles by violating GAAP is considered to be fraudulent accounting. However, using management discretion or flexibility to alter true financial information within the boundary of GAAP allows for various types of operation and accounting-based earnings management (Dechow, Sloan and Sweeney 1996). Accounting-based earnings manipulation includes changing accounting methods or estimates whereas operation-based manipulation includes changes in production, sales and inventory figures. The

term ‘earnings management’ is therefore related to exercising different accounting principles in order to achieve management purposes.

2.8.2 Earnings management incentives

The incentives for earnings management encompass a wide area from positive theory developed by Watts and Zimmerman (1986) to capital market incentives by Xiong (2006). The incentives of earnings manipulations have shifted from contractual agreements to capital market incentives. According to agency theory, in the case of any conflicts between the agent (manager) and the principals (owners), the agent will attempt to maximise his/her interest over the principals’ interests (Jensen and Meckling 1976). The conflict of objectives between the two parties causes the manager to manipulate earnings. In addition, given the increase in stock market valuation and equity-based compensation, researchers have placed importance on the capital market and its impact on earnings management to manipulate earnings (Sun and Rath 2008).

The various incentives for managers to manage earnings are an important issue to discuss before exploring the different approaches to earnings management. The earlier literature (Watts and Zimmerman 1986; Healy and Wahlen 1999; Dechow and Skinner 2000) has discussed various incentives for earnings management which have driven managers to manipulate earnings. This study has grouped these incentives into five categories which are discussed below.

2.8.2.1 Capital market incentives

Capital market expectations imply the expectations of the investor and financial analysts regarding financial information used to value stock, and to meet or beat earnings benchmarks and the performance of the firm. The use of financial information to influence the stock price and achieve target performance is an important incentive encouraging managers to manipulate earnings and influence a better stock price performance for a short-term period (Healy and Wahlen 1999; Dechow and Skinner 2000). A number of studies (Burgstahler and

Dichev 1997; Burgstahler and Eames 1998; Teoh et al. 1998; Teoh, Welch and Wong 1998; Daniel, Denis and Naveen 2008; Peek 2004; Glaum, Lichtblau and Lindemann 2004; Nelson, Elliott and Tarpley 2003; Athanasakou, Strong and Walker 2009; Madhogarhia, Sutton and Kohers 2009; Ambrose and Bian 2010) have investigated this category of earnings management incentive in different countries. They highlighted that managers' earnings management incentives evolve around various expectations, for example: to avoid losses by decreasing earnings; to meet expected dividend levels; to meet analysts' estimates by increasing earnings; to affect stock market values by increasing the share price; and to show the firm's future growth opportunities.

2.8.2.2 Management compensation contracts

It is considered that the compensation contract between the agent (manager) and the principal (owner) creates strong incentives for earnings management. If there is a policy to reward managers on the basis of reported earnings or stock performance, this may induce them to manipulate earnings in order to improve the apparent performance and receive the compensation/bonus. Healy (1985) underlined in his study that increasing a bonus plan influences managers to manipulate earnings. More specifically, managers are likely to increase reported earnings when earnings are between the upper and lower limits. However, managers are likely to use income-decreasing accruals or apply 'big-bath' activity when earnings are above the upper limit or below the lower limit to defer the income and increase the expected bonus for the next year. Managers often use their accounting judgment to manipulate earnings in order to receive a higher bonus when the bonus is based on reported earnings (Healy and Wahlen 1999). Watts and Zimmerman (1986); DeAngelo (1988); Baker, Collins and Reitenga (2003); and Balachandran, Chalmers and Haman (2008) later discussed the motives of managers for increasing earnings to present a higher share price and/or better firm performance that would suggest higher managerial efficiency. Dechow and Sloan (1991) investigated managers' behaviour in a situation when expected tenure with the firm was short. In their final years, managers exercised discretion and reported higher income. Therefore, managers

manipulate earnings and exhibit better performance to secure the job, and to ensure their bonus and compensation plan.

2.8.2.3 Lending contract motivations

Lending contracts imply external contracts, for example, debt covenants and dividend covenants. Debt covenants include restrictions by creditors regarding the payment of dividends, share buybacks and issuing of additional debt to ensure the repayment of firm borrowings. These lending contracts limit managers' actions and benefit stockholders at the expense of the firm's creditors (Watts and Zimmerman 1986). To avoid the costs of violating debt covenants, managers are motivated to manage earnings. Sweeney (1994) reported on firms that defaulted on debt contracts and suggested that these firms were engaged in income-increasing accounting changes. Moreover, managers used discretionary accruals to report higher income even in the year prior to the violation of debt covenants (DeFond and Jiambalvo 1994). Healy and Palepu (1990), DeAngelo, DeAngelo and Skinner (1994), and Holthausen (1981) experienced the evidence of earnings management for firms close to dividend covenants. Other earlier literature (e.g., Dechow, Sloan and Sweeney (1996); Jaggi and Lee (2002); Kanagaretnam, Lobo and Mathieu (2003); Othman and Zeghal (2006) also placed emphasis on lending contracts as a motive for earnings management. These studies discussed the finding that managers manage earnings by reducing current income and the cost of borrowing. In the case of financial distress, managers also tend to manage earnings to avoid debt covenant violations and/or restrictions.

2.8.2.4 Regulatory motivations

Various regulatory compliance relating to accounting standards, industry-specific regulations, anti-trust regulations and taxation laws apply to listed companies. Healy and Wahlen (1999) discussed two forms of regulatory incentives for earnings management: industry-specific regulations and anti-trust regulations. Regulations that are industry-specific (such as those which apply to banking, insurance or utility industries) induce managers to

manage income statement and balance sheet variables which are of interest to regulators. If their firms are in the vulnerable situation of anti-trust investigation or facing other adverse political consequences, managers are also induced to manage earnings to demonstrate less profit (Watts and Zimmerman 1978). Furthermore, Vafeas et al. (2003) suggest that when a company is going public, earnings are managed to increase or control the share price to attract investors to the firm. Managers also manipulate earnings to meet the informativeness required for earnings and regulatory standards (Subramanyam 1996; Christensen, Hoyt and Paterson 1999; Imhoff Jr and Lobo 1992).

2.8.2.5 Political cost motivations

Political cost implies all of the expected costs imposed on more visible firms in the form of potential adverse political actions such as anti-trust regulations, taxes, etc. To reduce the political cost, companies are often motivated to lower the profit figure by managing earnings. For example, Watts and Zimmerman (1986) discussed the view that firms with high accounting earnings are likely to decrease earnings in order to lessen political attention. Jones (1991) and Cahan (1992) found that several firms targeted by government authorities for import relief investigations and monopolistic observations used more income-decreasing accruals during the year in which investigations were carried out. Hong, Welch and Wong (1998) and Monem (2003) investigated different adverse political situations and reported that firms are motivated to decrease reported earnings to reduce political costs.

The five incentives above are the most common incentives that motivate managers to manage earnings.

2.8.3 Approaches used to detect earnings management

Various researchers have developed methods to measure earnings management, for example, changes of accounting policy/choices (Healy 1985; Sweeney 1994); real transactions (McNichols and Wilson 1988); specific accruals; the distribution of reported earnings

(benchmark beating); income smoothing; and total accruals and/or discretionary accruals (Jones 1991).

2.8.3.1 Changes of accounting policies

Many earlier studies (Watts and Zimmerman 1978; Hagerman, Hagerman and Zmijewski 1979; Bowen, Noreen and Lacey 1981; Holthausen 1981; Zmijewski, Zmijewski and Hagerman 1981; Robbins, Turpin and Polinski 1993; Christie and Zimmerman 1994) have reported income-increased or income-decreased earnings management through the use of various accounting methods and policies. Examples include: various inventory methods; depreciation methods; goodwill procedures; investment tax methods; incentive compensation plans; interest capitalisation policies; etc. These studies document that managers have the flexibility to choose an individual accounting method or a combination of different methods to exercise discretion over earnings and to achieve the desired incentives in terms of reducing tax payments, political costs and information production costs, and securing preferred regulations. Using a single accounting policy or method may limit the reporting of true earnings. Therefore, a combination of several accounting methods can be used to achieve the desired management incentives and to manage earnings.

2.8.3.2 Real transactions

Managers can also manipulate reported earnings through real transactions. Schipper (1989, p. 92) first introduced real transactions as an approach to manage earnings, stating that the definition of earnings management includes “real earnings management” by timing investment or financing decisions to alter reported earnings. Later, other studies (Baber, Fairfield and Haggard 1991; Dechow and Sloan 1991; Bartov 1993; Bushee 1998; Graham 2005; Roychowdhury and Roychowdhury 2006) mentioned various scenarios for managing earnings through real actions rather than accounting actions. Firms can manipulate earnings by selling fixed assets to avoid reporting loss or debt covenant violations (Bartov 1993) or, in the case of profit-making firms, can use research and development (R&D) expenditure to show

upward or downward earnings (Baber, Fairfield and Haggard 1991; Dechow and Sloan 1991; Bushee 1998). In more recent times, Roychowdhury (2006) investigated the application of real actions such as price discounts, showing overproduction used to increase sales and reduce the cost of goods sales thereby avoiding reporting losses and experiencing negative changes in earnings.

2.8.3.3 Earnings distribution

Earnings distribution is a relatively new approach to earnings management. Burgstahler and Dichev (1997) investigated the distribution of earnings after some manipulation or misrepresentation of earnings. Earnings distribution in these cases will show less or more than would be expected by observations which is just below or above the threshold, respectively. This distribution of earnings will result in discontinuity which is evidence of earnings management. McNichols (2001) reported that the earnings distribution approach is more powerful in detecting earnings management as it makes a strong prediction from the frequency of earnings realisation.

2.8.3.4 Income smoothing

The income smoothing approach to earnings management has been used since the 1980s (Eckel and Eckel 1981; Schipper 1989; Fudenberg and Tirole 1995; Defond and Park 1997). Managing earnings through income smoothing allows the reduction of the temporary volatility of earnings and produces a steady stream of profits (Schipper 1989). With this method, managers manipulate earnings as per some predetermined budget figure (Fudenberg and Tirole 1995; Defond and Park 1997) and keep the earnings consistent during ensuing periods. Management acts to maximise its own interest by showing a steady growth of earnings (Gordon, Horwitz and Meyers 1966). Ronen and Sadan (1981) and Lambert (1984) viewed income smoothing as a means to cheat or mislead shareholders by applying accounting procedures to smooth earnings. A firm is considered to be an income smoother if its cash flow volatility is higher than its earnings volatility (Imhoff 1977; Wang and Williams 1994). The

limitation in this approach is the problem of distinguishing between naturally smoothed earnings and intentionally smoothed earnings (Imhoff 1977). If earnings are less affected by particular business cycles, the firm is likely to have less volatile income streams which are natural and not intentional. The income smoothing approach achieves intentional results in earnings management.

2.8.3.5 Specific accruals

The use of specific accruals is different from total/discretionary accruals in the sense that specific accruals focus on industry settings whereas a single accrual is used to manipulate earnings. Earlier studies (McNichols and Wilson 1988; Petroni and Petroni 1992; Moyer and Moyer 1990; Beaver, Beaver and Engel 1996; Scholes, Wilson and Wolfson 1990; Beneish 1997; Teoh et al. 1998; Miller and Skinner 1998) reported that managers use various specific accruals such as depreciation estimates; bad debt provision; loan loss reserve; claim loss reserve; tax valuation allowances in regard to a specific industry such as initial public offerings; etc. to manipulate earnings. However, the use of specific accruals is not sufficient in itself to detect earnings management if a specific accrual is not sufficiently sensitive (McNichols 2001). Specific accruals may be useful to regulators and practitioners when constructing effective accrual models relevant to a specific industry situation (Healy and Wahlen 1999).

2.8.3.6 Total accruals/discretionary accruals

The use of discretionary accruals is the most common approach for quantifying earnings management. The earlier literature (Healy 1985; DeAngelo 1986b; McNichols and Wilson 1988; Jones 1991; Dechow, R. Sloan and A. Sweeney 1995; Kothari, Leone and Wasley 2005; Kasznik 1999; Dechow and Dichev 2002; Peasnell, Pope and Young 2000) reported the use of total accruals/discretionary accruals as being the major approach of deriving earnings management. Total accruals imply that management judgment and estimates are used to present the better economic performance of a firm. The two components of total

accruals are non-discretionary accruals and discretionary accruals. Non-discretionary accruals are imposed by accounting regulators to adjust a firm's cash flows, whereas managers choose and impose discretionary accruals to adjust a firm's cash flows to distort earnings within the flexibility of accounting regulations. Given this flexibility, managers have the opportunity to distort earnings with discretionary accruals (Dechow 1994). The current study uses discretionary accruals as the primary approach for detecting earnings management. The following section explains in detail the various discretionary accrual models used to detect and measure earnings management.

2.9 Discretionary Accruals

Since the mid-1980s, accruals have been used extensively when measuring earnings management. Healy (1985), DeAngelo (1986), Jones (1991), Dechow, Sloan and Sweeney (1995), Dechow and Dichev (2002) and Kothari, Leone and Wasley (2005) introduced the use of discretionary accruals. Researchers and regulators prefer accruals for more comprehensive measurement of earnings management. Managers prefer to use accruals/discretionary accruals in manipulating earnings because it is a more subtle, consistent approach; it does not require disclosure and allows them to make adjustments in cash flows (Healy 1985; Gaver, Gaver and Austin 1995; Holthausen, Larcker and Sloan 1995). Discretionary accruals are more desirable for measuring earnings management compared to changes in accounting policies; real transactions; specific accruals; and income smoothing and earnings distribution approaches. The current study focuses on discretionary accruals as a proxy for earnings management. The most common models used in the literature to estimate discretionary accruals as a proxy for earnings management are discussed below.

2.9.1 Models for detecting earnings management

2.9.1.1 Healy model

Healy (1985) first used discretionary accruals, a component of total accruals, to measure the extent of earnings management. Healy stated that accruals are strongly associated

with managers' income-reporting incentives under bonus contracts: this implies that managers exercise discretion over accruals to maximise the benefits of their bonus scheme. Managers are more likely to choose income-decreasing accruals when the upper and lower bounds are limited whereas income-increasing accruals are chosen when these bounds are not limited. Healy assumed that discretionary accruals are subject to management discretion while non-discretionary accruals are the expected level of a firm's accruals given no earnings manipulation. This implies that non-discretionary accruals are expected to be zero (0) and discretionary accruals equal to the total accruals scaled by lagged total assets. Dechow, Sloan and Sweeney (1995) tested the Healy model and defined discretionary accruals as the deviation of total accruals in the event period from the mean total accruals during the estimation period.

The Healy model differs from other earnings management studies as Healy assumed that systematic earnings management occurs in every time period. This model uses the level of working capital as discretionary accruals, implicitly assuming that non-discretionary accruals are constant. Healy (1985) reported that accruals can modify the timing of reported earnings which enables managers to transfer earnings between different periods. Therefore, Healy segregated earnings into cash flow from operations and total accruals, and measured the estimated discretionary accruals based on total accruals scaled by lagged total assets which are calculated following the balance sheet method. This model estimates discretionary accruals on the basis of total accruals scaled by lagged total assets.

Several studies examined managers' motivations for manipulating earnings and maximising their bonus plans. Holthausen, Larcker and Sloan (1995) investigated the extent of earnings management associated with bonus plans and suggested that managers make income-decreasing discretionary accruals after they reach their maximum bonus level. Unlike Healy, they found no evidence that managers manipulate earnings downward when earnings are below the threshold to receive any bonus. Gaver, Gaver and Austin (1995) also extended the Healy model by assuming that discretionary accruals rather than total accruals are a proxy for earnings management, and stated that managers select income-increasing discretionary

accruals (and vice versa) when earnings before discretionary accruals fall below the lower bound (and vice versa). In their study, income smoothing is more consistent with the earnings management incentive than with bonus maximisation. Similarly, Burgstahler and Dichev (1997) found evidence of earnings management that was consistent with income smoothing. Guidry, Leone and Rock (1999) used a different proxy for earnings management by computing total accruals (Healy 1985) and discretionary accruals (Jones 1991) to test Healy's bonus maximisation hypothesis and suggested that managers make decisions to use discretionary accruals to maximise their short-term bonuses. As in the Healy model, Aharony, Lin and Loeb (1993) and Phillips, Pincus and Rego (2003) used total accruals as a proxy for discretionary accruals to measure earnings manipulation. Aharony et al. (1993) examined a special case of earnings manipulation by firms before an initial public offering. Their study reported a minor manipulation of earnings was most likely among small firms and firms with a large financial leverage. These manipulations were influenced by the quality of firms' auditors and underwriters.

The Healy model is the simplest of all earnings management models: it is expected to contain measurement error which comes from omitted variables affecting accruals in the current year. For example, any changes in economic factors in the current year of a firm will affect the level of accruals without changing the estimate of discretionary accruals. The Healy model lacks power and involves a misspecification problem due to the technique's poor ability to separate discretionary accruals in cases where firms present extreme financial performance (Dechow, R. Sloan and A. Sweeney 1995). Moreover, Healy's use of total accruals as a proxy for discretionary accruals is subject to criticism (Kaplan 1985; McNichols and Wilson 1988; Holthausen, Larcker and Sloan 1995; Kang and Sivaramakrishnan 1995) because this proxy introduces bias. In addition, the assumption by the Healy model of constant non-discretionary accruals is unlikely to be empirically descriptive because non-discretionary accruals are expected to change along with a firm's business activities (Kaplan 1985).

2.9.1.2 DeAngelo model

(DeAngelo 1986a) investigated accounting decisions made by managers who proposed management buy-outs of public stockholders and reported that no indication of systematic understatements of reported income was found through accounting accruals in the periods before the buy-outs. The DeAngelo model (1986) is similar to the Healy model in the sense that non-discretionary accruals are restricted to the prior year's observations. Unlike the Healy model, the DeAngelo model assumes that non-discretionary accruals follow a random process and uses the changes in total accruals from year $t-1$ to year t to represent the discretionary component. DeAngelo assumed that the first differences in total accruals are expected to have a value of zero (0) under the null hypothesis of no earnings management. This model measures earnings management by computing the first differences in total accruals.

A special feature of the DeAngelo model is that the estimation period for non-discretionary accruals is restricted to the previous year's observations (Dechow, R. Sloan and A. Sweeney 1995). If non-discretionary accruals are constant over time and discretionary accruals have a mean of zero (0) in the estimation period, then both models will measure non-discretionary accruals without error. However, non-discretionary accruals are expected to change every year according to economic circumstances (McNichols 2001; Kaplan 1985). The nature of the accrual accounting process is therefore likely to change in response to changes in these circumstances.

Aharony, Lin and Loeb (1993) used a similar approach to that used in the Healy and DeAngelo models to examine whether firms undertook earnings management before going to public offering. Their study used total accruals as a proxy and concluded that, in the special case of public offering, there was weak evidence of earnings management through accounting accruals. Bartov, Gul and Tsui (2000) reported that discretionary accruals are more likely to be associated with receiving qualified audit reports if the Healy model has been used. The findings of that study did not support the DeAngelo model's ability to detect earnings

management. Guay, Kothari and Watts (1996) suggested that neither the Healy model nor the DeAngelo model were effective in separating discretionary accruals from total accruals if three managerial discretionary hypotheses, namely, opportunism, firm performance or noise were assumed.

As with the Healy model, the DeAngelo model does not consider the impact of changes in economic circumstances and assumes that all earnings management activities can be captured by total accruals which are unlikely to be empirically descriptive. Although both models capture either the income-increasing or income-decreasing techniques that managers apply for incentives, they fail to recognise the changing non-discretionary accruals and misclassifications. Therefore, both the models tend to detect earnings management with errors that arise from omitted variables affecting accruals in the current year. In addition, both models experience a lack of power and have misspecification problems due to their inability to separate discretionary accruals in situations of extreme financial performance (Dechow, Sloan and Sweeney 1995). Many current studies do not use either the Healy or DeAngelo models; however, these models have continued to inspire further research.

2.9.1.3 Jones model

To overcome the limitations of the Healy and DeAngelo models, Jones (1991) introduced a linear regression approach to control non-discretionary determinants of accruals and found that US managers exercised more negative discretionary accruals to reduce income during an import relief investigation. Unlike the Healy and DeAngelo models, Jones (1991), in her model, assumed that earnings management occurs only in the event period and that no systematic earnings management occurs during the estimation period. It is also expected that the Jones model will capture more non-discretionary accruals compared to the models proposed by Healy and DeAngelo (Dechow, R. Sloan and A. Sweeney 1995).

Jones (1991) assumed that non-discretionary accruals are not constant over time: she therefore attempted to control for the effect on non-discretionary accruals of changes in a firm's economic circumstances. Jones made an implicit assumption that related revenues are

free of the manager's discretion. However, in many instances, revenues themselves are a prominent source of earnings management with Jones herself indicating that this is a limitation of her model. As a firm's working capital accruals depend on sales and depreciation accruals on the levels of property, plant and equipment (PPE), Jones further assumed that changes in sales would control for non-discretionary accruals of current assets and liabilities, and that changes in property, plant and equipment would control for the non-discretionary component of depreciation expenses. Jones included changes in sales revenues and the level of gross property, plant and equipment (PPE) as determinants of non-discretionary accruals in the event year. The variables used in the Jones (1991) model are measured by lagged beginning total assets to adjust for heteroscedasticity (Dechow, R. Sloan and A. Sweeney 1995; Dechow et al. 2012) which indicates that the magnitude of a firm's discretionary accruals are indicated as the percentage of the firm's total assets. The residual from the regression of total accruals on changes in sales, property, plant and equipment is used as a proxy for discretionary accruals. The two approaches used to calculate total accruals are the balance sheet and the cash flow statement. The Jones model uses the balance sheet approach to calculate total accruals with data for the variables obtained from the balance sheet and income statement. Total accruals are measured as changes in non-cash current assets minus changes in current liabilities (excluding current maturity of long-term debt) less the depreciation expenses for the period.

Jones (1991) used time-series data to estimate the parameters in her original version of the model with this proven to be more restrictive due to the use of long-term time-series data. However, more recent researchers have preferred a cross-sectional version of the Jones model over the time-series version because it is likely to provide more control, an increase in the power of the test and better specification (Subramanyam 1996; Bartov, Gul and Tsui 2000; DeFond, DeFond and Jiambalvo 1994; Becker et al. 1998). In the case of the cross-sectional Jones model, the parameters are estimated using cross-sectional data.

Many studies make use of the Jones model as a model of aggregate accruals which is applied in detecting earnings management (Gaver, Gaver and Austin 1995; Kang and

Sivaramakrishnan 1995; Guay, Kothari and Watts 1996; Kasanen et al. 1996; Subramanyam 1996; Becker et al. 1998; Bartov, Gul and Tsui 2000; Peasnell, Pope and Young 2000; Jeter and Shivakumar 1999; Bernard and Skinner 1996; Balsam 1998; DeFond and Jiambalvo 1994). Guay, Kothari and Watts (1996) used market-based tests (with US data) of discretionary accrual models and stated that only the Jones model and the modified Jones model effectively detect discretionary accruals, are consistent with opportunistic accruals and measure performance hypotheses. Guay, Kothari and Watts (1996) evaluated the time-series Jones model and modified Jones model using a market-based procedure and concluded that neither procedure generates a reliable measure of accrual management. While Guay, Kothari and Watts (1996), Dechow, Sloan and Sweeney (1995) and Kang and Shivaramakrishnan (1995) examined the performance of accrual models using the time-series Jones model, the examination of the literature indicates that cross-sectional models are now more widely used in contemporary earnings management studies (Peasnell, Pope and Young 2000). Jeter and Shivakumar (1999) added a new variable, cash flows, to the original Jones model to control for the negative effect of cash flows on total accruals with this named the CFO model (the Jones model controlling for cash flows).

As in the work of Shivakumar (1997), and Rangan (1998), their study also used quarterly data along with annual data to detect event-specific earnings management and to examine the specification and statistical power of the cross-sectional Jones model. The result showed that the misspecification of the Jones model as reported by Dechow, Sloan and Sweeney (1995) is not limited to firms experiencing extreme performance. Moreover, the CFO model is reported as being more specific and powerful in detecting earnings management. Becker et al. (1998) investigated the relationship between audit quality and earnings management using the cross-sectional Jones model. Their study stated that high quality audits (i.e., for clients of the Big Six auditors) report less use of discretionary accruals to increase income than low quality audits (i.e., for clients of non-Big Six auditors). Similarly, Bartov, Gul and Tsui (2000), with US Compustat data, used the cross-sectional Jones model to

examine the association between discretionary accruals and audit qualification: they suggested that the cross-sectional version is better than time-series analysis in detecting audit qualification which is an indicator of the presence of earnings management. Balsam (1998), using a time-series version of the Jones model (1991) with US Compustat data, examined the relationship between CEO compensation, accounting income before discretionary accruals and discretionary accruals to analyse whether accounting choices influence CEO compensation. The result of Balsam's (1998) study demonstrated that CEO compensation is significantly positively associated with income before discretionary accruals which means positive discretionary accruals increase CEO cash compensation. Subramanyam (1996) used the Jones model to examine whether stock market prices influence the use of discretionary accruals and to predict future profitability and the dividend. Using US data, Subramanyam suggested that the cross-sectional Jones model performed better than the time-series model in segregating discretionary accruals from non-discretionary accruals.

While the cross-sectional Jones model was better specified than alternative models in Subramanyam's (1996) study, it was not free of measurement error, thus demanding modification of the original Jones model. In order to improve the formulation of the Jones model, DeFond and Jiambalvo (1994) and Teoh, Wong and Rao (1998) focused exclusively on the working capital components of total accruals. DeFond and Jiambalvo (1994) investigated the practice of increasing accounting income to avoid debt covenant violation. Using US data (Compustat) in time-series and the cross-sectional Jones models, their study observed significant positive abnormal total and working capital accruals in the year prior to violation thus providing evidence of earnings manipulation in that year. Bernard and Skinner (1996) investigated two studies (Subramanyam 1996; Kasanen et al. 1996) on accruals both of which considered the motivations of managers for manipulating accounting accruals and argued that abnormal accruals estimated using the Jones model reflect measurement error due to the systematic misclassification of normal accruals as abnormal accruals.

Differing from many US studies, Kasanen et al. (1996) detected earnings management within the different institutional environment of companies in Finland: they concluded that Finnish managers set earnings to satisfy the demand for dividends. Young (1999) reported that the Jones model, based on total accruals, induces substantial measurement error in the results when estimating managed accruals. Most of these studies used US data in the application of the Jones model. However, Peasnell, Pope and Young (2000), with a sample of UK non-financial companies, examined model specification and power issues relating to the measurement of abnormal accruals using cross-sectional estimation procedures. Consistent with the prior US studies on earnings management, their study suggested that the Jones and modified Jones models along with a new model, named ‘the margin model’, were well specified when used in a random sample of firm years. In addition, these models were relatively powerful in detecting artificially-induced earnings management. Using the Jones model as an extension of the use of the Healy model, Gaver et al. (1995) suggested that the former is more successful in separating discretionary and non-discretionary accruals and provides more reliable insights.

The Jones (1991, footnote 17) model implicitly assumes that revenues are non-discretionary which lowers the power of the model and fails to capture managed earnings arising from managed revenues: this is considered to be a limitation of this model. Furthermore, Jones (1991, footnote 31) mentioned that her model orthogonalises total accruals with respect to revenues; this, therefore, removes the discretionary component of accruals that causes the estimate of earnings management to be biased towards zero (0). Dechow, Sloan, and Sweeney (1995) thus proposed that revenues (especially credit sales) can be a useful source of earnings management and recommended a modification in the original Jones model to also capture earnings management through discretionary revenues. Kothari, Leone and Wasley (2005) criticised the Jones model stating that it is important to control for the impact of firm performance on discretionary accruals but this is absent in the Jones model.

2.9.1.4 Modified Jones model

Dechow, Sloan and Sweeney (1995) suggested a modification to the original Jones model to overcome the limitations. They suggested that, in order to estimate non-discretionary accruals in the event period, firms need to deduct changes in receivables, which are assumed to be discretionary, from total changes in revenues. The modified Jones model assumes that all changes in credit sales in the event period result from earnings management: this assumption considers that it is easier to manage earnings by exercising discretion over the recognition of revenue on credit sales than over the recognition of revenue on cash sales. Therefore, the uniqueness of the modified Jones model is its treatment of accounts receivables. In this modification of the Jones model, the estimation of firm-specific parameters/coefficients is the same as for the original Jones model. The residual from the regression of total accruals on changes in sales and on property, plant and equipment where revenue is adjusted for changes in receivables in the event period is used as a proxy for discretionary accruals.

As in the Jones model, the original modified version used time-series data to estimate the parameters in calculating discretionary accruals. Both of the models using time-series data have proven to be more restrictive due to the need to use long-term time-series data to effectively estimate the parameters in the analysis. To maximise the sample size and to avoid the survivorship bias problem inherent in using time-series data, many studies use the cross-sectional version of the model (DeFond and Jiambalvo 1994; Subramanyam 1996; Becker et al. 1998; Bartov, Gul and Tsui 2000; Peasnell, Pope and Young 2000) which has improved the ability of the model to detect earnings management. However, a limitation of the cross-sectional model is that it treats all discretionary accruals the same for every firm in an industry, regardless of differences in operating strategy or phases in the product life cycle.

Dechow, Sloan and Sweeney (1995) and Guay, Kothari and Watts (1996) reported that the modified Jones model is relatively more powerful with better specification in detecting discretionary accruals than the original Jones model and other models (i.e., Healy, DeAngelo) identified in the accounting literature. Previous models (i.e., Healy, DeAngelo and Jones)

showed a lack of power and misspecification due to their inability to separate discretionary accruals and correlated omitted variables in samples with extreme financial performance (Dechow et al. 2012). However, all these models generated well-specified test statistics when applied to random samples. The modified Jones model contains the least measurement error when detecting earnings manipulation through accounts receivables.

The modified Jones model has also been widely used to measure earnings management in the literature (DeFond and Jiambalvo 1994; Guay, Kothari and Watts 1996; Beneish 1997; Becker et al. 1998; Teoh et al. 1998; Bartov, Gul and Tsui 2000; McNichols 2001; Davidson, Goodwin-Stewart and Kent 2005; Lobo and Zhou 2006; Xiong 2006; Peasnell, Pope and Young 2005; Wright, Shaw and Guan 2006; Bergstresser and Philippon 2006; Heninger 2001; Barton 2001). Bartov, Gul and Tsui (2000) evaluated the ability of the cross-sectional modified Jones model to detect earnings management by examining the association between discretionary accruals and audit qualification. Their study concluded that the cross-sectional modified Jones model is better than time-series analysis in measuring audit qualification. Lobo and Zhou's (2006) investigation found that the extent of managerial discretion has decreased over financial reporting following the Sarbanes–Oxley Act (SOX). Their study also reported an increase in conservatism in financial reporting following SOX, resulting in SEC requirements that the company's CEO or Chief Financial Officer (CFO) certify the financial statements. Davidson et al. (2005) examined the association of earnings management with the internal governance structure of companies in Australia where corporate governance is less regulated and the choice of internal governance structure is voluntary (Von Nessen 2003). Of four important governance mechanisms, the two mechanisms of having a majority of non-executive directors on the board and on the audit committee (AC) are significantly associated with a lower level of earnings management. Moreover, the other two mechanisms, the voluntary establishment of an internal audit function (IAF) and the choice of external auditors, are not significantly related to a lower level of earnings management. Therefore, Von Nessen's (2003) study implies that the board (BOD) and AC that have a majority of external directors

are more closely related to a lower level of earnings management. Heninger (2001) examined the association between auditor litigation and abnormal accruals. Using the modified Jones model on time-series data of US companies, Heninger's (2001) study suggested that auditor litigation increases as clients report more income-increasing abnormal accruals and thus auditors should be more careful in investigating income-increasing abnormal accruals.

McNichols (2001) tested the relationship between discretionary accruals' estimates and growth with cross-sectional data from US companies using the original Jones model and the modified Jones model. McNichol's (2001) study suggested that both models, which did not consider long-term earnings growth, were not sufficiently powerful or reliable enough to assess earnings management. Bergstresser and Philippon (2006) used the Jones model and the modified Jones model to evaluate the relationship of CEO compensation with earnings management and suggested that firms in which CEOs' compensation is more closely related to the value of stock and option holdings would result in more discretionary accruals. With the exception of Peasnell et al. (2005) which used UK data, the existing research is predominantly US-based. Peasnell, Pope and Young (2005) investigated the association of earnings management with board monitoring of UK firms applying a cross-sectional modified Jones model. Their study suggested that the proportion of external directors on the board is negatively related to managers' practice of income-increasing abnormal working capital accruals to avoid reporting losses, turning a loss into a profit or ensuring a profit figure does not decline. Therefore, they found that external directors on the board play an important role in detecting abnormal accruals and maintaining the credibility and integrity of financial statements.

Beneish (1997), using US Compustat data, examined the ability of the modified Jones model to detect earnings management by firms experiencing extreme financial performance who had been identified as violators of the generally accepted accounting principles (GAAP). Their study stated that the modified Jones model does not perform well in detecting earnings management for GAAP violators. Consistent with Guay, Kothari and Watts (1996), their study

also mentioned that by considering managers' incentives and recognising discretionary accruals' reversal option, there is a greater possibility of identifying discretionary accruals. In regard to lag accruals, they found that GAAP violators were more likely to have consecutive positive accruals in the years leading to and including the year of the GAAP violation. Teoh, Wong and Rao (1998) used a cross-sectional modified Jones model with US Compustat data to examine how investors react to an unusually aggressive practice of earnings management. Income-increasing accounting adjustments by the issuers may lead investors to be overly optimistic; this is why investors may misinterpret high earnings reported at the time of the offering and consequently overvalue the new issue. Their study stated that the discretionary component of current accruals is better than firm size at explaining future returns as well as the book-to-market value of equity. Moreover, specifically for firms engaging in new equity offerings, they found that current discretionary accruals are more likely to have a negative effect on future company returns.

Using the cross-sectional modified Jones model in a sample of US and UK firms, Wright, Shaw, and Guan (2006) investigated the practice of earnings management in countries where the level of investor protection by the legal environment is high. Their study reported, that prior to management buy-out (MBO), managers in both countries manage earnings downwards with US firm managers significantly more aggressive than UK firm managers.

Barton (2001) assessed the extent of managers' trade-offs with derivatives and discretionary accruals to control earnings volatility. Managers can use derivatives to reduce the volatility of earnings and cash flows caused by fluctuating interest rates, foreign exchange rates, commodity prices and other risk factors. Barton's study reported that firms with derivatives also have a lower level of discretionary accruals which helps to smooth earnings and lowers earnings volatility. Similar to Barton's (2001) findings, several other academic studies document that managers use discretionary accruals to reduce earnings volatility (Watts and Zimmerman 1986; Subramanyam 1996; Defond and Park 1997).

It has been found that two commonly used discretionary accrual models (i.e., the Jones and modified Jones models) are misspecified when applied to samples experiencing extreme performance (Dechow, Sloan and Sweeney 1995). Therefore, in testing for earnings management, the correlation between accruals and performance is problematic. While the Jones model and the modified Jones model attempt to control for contemporary firm performance, Kothari, Leone and Wasley (2005) suggested estimation of discretionary accruals as they influence a firm's contemporary and past performance.

2.9.1.5 Performance-matched modified Jones model

Kothari, Leone and Wasley (2005) introduced a performance-matched modified Jones model to control for misspecification related to firm performance. To overcome the problem of low power and model misspecification, it is important to control for firm financial performance (Dechow, Sloan and Sweeney 1995). Kothari, Leone and Wasley (2005) argued that discretionary accruals, as measured by both the Jones model and the modified Jones model, might involve severe measurement error because these models disregard firm performance. Unlike the previous models of discretionary accruals, which fail to capture model specification for firms in the sample with extreme financial performance, the performance-matched modified Jones model places emphasis on firm performance. Firms with extreme performance are likely to engage in earnings management (Kothari, Leone and Wasley 2005). In addition, firm performance is related to accruals because accruals are expected to be systematically non-zero for firms experiencing unusual performance.

Kothari, Leone and Wasley (2005) adjusted a performance-matched firm's discretionary accruals on the basis of the firm's return on assets (ROA) and industry membership. The motivations to use ROA as a matching variable rather than using other variables (e.g., size, earnings growth, earnings yield, market-to-book value to equity, etc.) are two-fold. Firstly, ROA controls for the effect of firm performance on measured discretionary accruals (Dechow, Sloan and Sweeney 1995) and, secondly, as suggested by Barber and Lyon (1996), ROA detects abnormal operating performance. In order to control for firm

performance using ROA in estimating discretionary accruals, performance matching based on the current year's ROA outperforms the prior year's return on assets (ROA) (Jones, Krishnan and Melendrez 2008). Dechow, Sloan and Sweeney (1995) and Kasznik (1999) similarly suggested that discretionary accruals followed by the Jones model are significantly positively related to return on assets (ROA). To solve performance-related misspecification, Kothari, Leone and Wasley (2005) introduced ROA as an additional independent variable into the modified Jones model. This model calculates performance-matched discretionary accruals by matching the firm-year observation of the treatment firm with the firm-year observation for a control firm from the same industry and year with the closest ROA in the current year or the prior year and then subtracting the control firm's discretionary accruals from the treatment firm's discretionary accruals. Performance matching by ROA controls the influence of firm performance on discretionary accruals and is considered better than any other matching variable for mitigating performance-related misspecification (Dechow et al. 2012). Kothari, Leone and Wasley (2005) adopted the performance-matched model to mitigate the misspecification problem observed in the previous models, although Jones, Krishnan and Melendrez (2008) indicated that Kothari, Leone and Wasley (2005) did not examine the accrual estimation error. However, this model resulted in an extensive reduction in test power which emphasised the need for consideration of relevant omitted variables in the matching procedures (Dechow et al. 2012).

In terms of the limitations of performance-matching procedures, Dechow et al. (2012) stated that performance matching is only effective in mitigating misspecification when it is matched to the relevant correlated omitted variables. Moreover, performance matching reduces test power by increasing the standard error of the test statistics. This performance-matched model has ignored the consequences of error in estimating total accruals using the balance sheet approach. As the error in the balance sheet approach is related to a firm's economic characteristics, this results in reducing the power of the model to detect either

earnings management or the generation of incorrect earnings management (Hribar and Collins 2002).

2.9.1.6 Dechow and Dichev model

Dechow and Dichev (2002) suggested a new approach to examining the quality of working capital accruals and earnings. They assumed that accruals shift or adjust for the recognition of cash flows over time, so that the adjusted numbers (earnings) better reflect actual firm performance (Financial Accounting Standards Board [FASB] 1978, Statement of Accounting Concepts No. 1, para. 44). Two types of estimations were involved to assess the relationship between accruals and earnings quality: accurate estimates and erroneous estimates. Accurate estimates implied a better estimate of the relationship between current accruals and past, present and future cash flows, while an erroneous estimate reduced the beneficial role of accruals. This model suggests that accruals are estimates of future cash flow realisation, so that quality of accruals and earnings are negatively related to the accrual estimation error (Dechow and Dichev 2002; McNichols 2002).

Among many definitions of earnings quality by researchers in the accounting literature, Dechow and Dichev (2002)'s definition viewed earnings quality in terms of the relationship between accruals and cash flows. This definition did not differentiate among other factors, for example, the uncertainty in a firm's environment, its management ability and the extent to which accruals are manipulated and influence this relationship. On the other hand, estimation error has been defined as the difference between the amount accrued and the amount realised. Dechow and Dichev (2002) defined the quality of accruals and earnings as the extent of these errors.

Their model is different from existing research in which accrual quality is systematically related to observable and recurring firm characteristics, such as the volatility of operations because higher volatility is associated with higher unavoidable estimation errors. Moreover, Dechow and Dichev's (2002) study found a positive relationship between accruals, accrual quality and earnings persistence, which suggests that firms can gain important practical

benefits by identifying and measuring accrual quality. Furthermore, Dechow and Dichev (2002) showed the linkage between current accrals and cash flows in the immediately adjacent periods and thereby developed a model to measure estimation error in anticipated cash flows (McNichols 2002). Their model is used in firm-specific time-series regression analysis where all variables are deflated by beginning total assets to estimate working capital accrual quality. Their model also measured accrual quality as the standard deviation of the residuals from the firm-specific regression of working capital accrals on the previous year, current year and one year forward cash flows from the firm's operation.

The purpose of the Jones (1991) model, that is, to separate discretionary accrals from total accrals, is different from that of the Dechow and Dichev (2002) model which aimed to assess accrals as a whole. Dechow and Dichev did not separate management-induced effects, that is, discretionary accrals from all other effects. Jones, Krishnan and Melendrez (2008), with cross-sectional data, measured accrual quality using the Dechow and Dichev model. Jones, Krishnan and Melendrez (2008) suggested that accrual estimation errors from the cross-sectional Dechow and Dichev (2002) model of working capital changes on past, present and future cash flows have incremental predictive ability to measure fraud or the absence of fraudulent restatements of earnings. Dechow and Dichev (2002) mentioned that if a firm's objective is to correct temporary matching problems with cash flows, then non-discretionary accrals should be negatively correlated with the present year's cash flows and positively related to adjacent years' cash flows. Dechow and Dichev (2002) therefore proposed to include past, present and future years' cash flows as additional variables to measure non-discretionary accrals.

Dechow and Dichev (2002) stated that, although their model determines the extent by which accrals map the related cash flows, a limitation is that it provides little insight into the proper timing of these accrals with respect to cash flows. For example, this approach cannot be used to decide whether to treat R&D as an expense or to capitalise it.

2.10 Endogeneity

Endogeneity is a problem in corporate governance research, specifically internal audit, audit committee, earnings management which is inherent and difficult to address (DeFond and Francis 2005; Larcker and Rusticus 2010). There is a potential threat of the presence of endogeneity which could be due to ‘simultaneity’ and/or omitted variables in corporate governance research. Brown P et al., (2011) mentions two commonly used methods, fixed-effects estimation and an instrumental variables (IV) approach, to solve the problem of endogeneity. Major limitations of fixed-effects approach is to rely only on within-firm variation, which is not feasible in corporate governance research. The selection of relevant and correlated instruments with the suspect endogenous variable is the key challenge in an instrumental variable approach. Otherwise, instrumental variable estimation can yield worse value than ordinary least square (OLS) result. None of the methods properly solve the problem of endogeneity in the research. The endogeneity issues considered involve either making some adjustment by allowing for the inclusion of a relevant exogenous variable, which was not identified and the decision is made to make no allowance for endogeneity as a feasible option in this study.

2.11 Summary of the Chapter

Chapter Two has discussed the background of the study by reviewing the prior literature on the nature of the internal audit function (IAF) and its importance in corporate governance. The institutional and regulatory environment of internal audit in Australia was then described to provide insights and information on the current regulatory environment. This chapter also provided detailed information about internal audit outsourcing (IAO) practices as these relate to motivations and their pros and cons to justify the increasing trend and importance of outsourcing practices worldwide and in particular, in Australia. The chapter later discussed the prior literature on an effective AC and BOD in relation to their association with internal audit, outsourcing and internal audit quality (IAQ). Discussion then moved to various aspects of the

earnings management literature on incentives, approaches and several models that are used to detect earnings management. This was followed by the summary of the chapter.

Chapter Three next discusses the theoretical perspective of the current study. Agency theory is used to describe the practices of internal audit, the AC, the BOD and earnings management. In addition, the chapter reviews the key literature relating to the testable hypotheses. The rationale of each hypothesis that is used to test the associations of explanatory variables is presented separately in this chapter. Later, a conceptual schema is provided to outline the key relationships examined in the study: this is followed by a summary of Chapter Three.

Chapter Three: Theoretical Framework and Hypotheses Development

3.1 Overview of the Chapter

Chapter Two discussed the prior literature on internal audit, outsourcing and the corporate governance issues that impact on the existence of internal audit and outsourcing of internal audit by ASX-listed firms. The prior literature on various aspects of earnings management was also discussed, specifically in relation to incentives, approaches and various models used to detect earnings management.

Chapter Three discusses the theoretical framework and the hypotheses developed to analyse the research questions. This study uses agency theory which is the most widely used in corporate governance research and thus is the appropriate framework to examine internal audit, outsourcing and earnings management studies. The chapter also discusses the related literature to test the hypotheses and justify the expected association of explanatory variables with internal audit, outsourcing and earnings management. Finally, a conceptual schema is provided to outline the key relationships examined in the study followed by a summary of the chapter.

3.2 Theoretical Perspective

Agency theory is used as the theoretical framework to discuss the corporate governance mechanisms in the context of this study. There are two approaches of agency theory, “positive theory of agency” and the “principal-agent” literatures. Both the approaches address the contracting problems that exists among individuals with different self interest (Jensen and Smith 2000). Positive agency theory concentrate more on contacral relationship within the company assuming that any contracting relationship aims to reduce the agency cost. Positive agency theory, as it applies to motivation theory (psychological school), is appropriate to this research. There are four motivational theories, picoeconomics, expectancy theory, cumulative prospect theory and need theory (Steel and König 2006). The most common and well accepted features among these theories is time that work as motivational factor. All have the theories

have limitations, but together motivate this research. Agency theory provides the best option when examining moral obligations and the unethical practices of earnings management (EM).

Agency theory is used as the theoretical framework to discuss the corporate governance mechanisms in the context of this study. The objectives of the study are to analyse whether an effective audit committee (AC) and board of directors (BOD) are associated with the decision to establish an internal audit function (IAF) or internal audit outsourcing (IAO) and the extent of the latter. Moreover, the study explores the association between the existence of an IAF, outsourcing and the extent of outsourcing in relation to earnings management. Agency theory is the most appropriate theory applied in earlier empirical research relating to internal audit, outsourcing and earnings management. This section will discuss this theory and provide support for its use to develop the hypotheses.

Agency theory has emerged as a dominant paradigm in the financial economic literature (Jensen and Meckling 1976; Ross 1973). It is the most widely used theory in corporate governance research (Jensen and Meckling 1976; Dalton et al. 1999; Caplan and Kirscheneiter 2000; Daily, Dalton and Cannella Jr 2003; Shleifer and Vishny 1997). This theory focuses on the relationship between the principal (owners of economic resources) and the agent (managers) of the firm (Fama 1980; Hill and Jones 1992). It assumes that there is an economic contract between the principal and the agents who are charged with using and controlling those resources (Jensen and Meckling 1976). Under this contract, the principal delegates the decision-making authority to the agent who has certain obligations to fulfil towards the principal. Berle and Means (1932) initially documented the principal–agent relationship. According to this theory, the agents have more information and possess superior knowledge and expertise than the principal, which creates information asymmetry and results in conflicts of interests between the principal and the agent. Information asymmetry adversely affects the monitoring ability of the principal to oversee whether the agent is properly serving his/her interests. However, according to agency theory, the agents have self-seeking motives and are inclined to act against the interest of the principal (the owners) of the firm. In effect,

both parties act rationally to maximise their own interest and wealth in this contracting process. This conflict of interests creates a “moral hazard” (Scapens 1985). It is important to attain “pareto-optimality”, meaning a state that results in efficiency in the contracting process where both parties cannot enhance their own wealth or interest at the cost of the other party (Adams 1994). The state of efficiency refers to the situation where both the principal and the agent incur contracting (monitoring and bonding) costs offsetting the agency cost and both parties benefit. For example, the principal can incur monitoring expenditure by external audit scrutiny of the reliability of the financial statement. On the other hand, the agents can incur bonding costs by employing internal audit to affirm to the principal that they are acting efficiently for his/her interest. In this process, both parties incur contracting costs thereby maximising their own interests without hampering the other party’s interests.

According to agency theory, agency costs arise owing to the separation of ownership and control in corporations (Fama and Jensen 1983a). Monitoring mechanisms are implemented to minimise agency costs by limiting the irregular activities of top management who are responsible for decision control (Jensen and Meckling 1976). Agency theorists argue that corporate governance structures (e.g., the BOD, the AC, and external and internal audit functions) are mechanisms that reduce agency conflicts (Fama and Jensen 1983a; Williamson 1984). These mechanisms play a crucial role in effectively monitoring and controlling managers in order to minimise agency costs and safeguard shareholder wealth (Stiles and Taylor 2001). Therefore, the BOD and AC constantly struggle to reduce agency costs, protect shareholders from management’s conflict of interest and add firm value (Fama and Jensen 1983b). Corporate governance structures (e.g., an independent BOD, an independent chairperson and independent board sub-committees such as the AC) are considered as important mechanisms to reduce agency costs by limiting management discretionary behaviour (Dalton et al. 1999).

From an agency perspective, the ability of the board to act as an effective monitoring mechanism is dependent upon its independence from management (Beasley 1996; Dechow,

Sloan and Sweeney 1996). An optimal board structure, separation of the roles of BOD chairman and CEO and having a majority of external directors on the board all help to reduce agency costs (Fama and Jensen 1983b). Furthermore, Jackling and Johl (2009) used agency theory to examine the components of BOD effectiveness including board composition and board leadership to evaluate their impact on firm performance. These two components of BOD effectiveness act as key elements of good corporate governance in an organisation. Therefore, these components incur monitoring expenditure in order to reduce agency costs which reflects better firm performance and corporate governance.

Agency theory is considered a viable framework for examining internal audit issues. Adams (1994) argues that agency theory helps to justify the existence of internal audit, the nature of the IAF and the particular approach adopted by internal auditors in their work. Watts (1988) also suggests that examples of bonding cost incurred by the agent include expenditure on audit committees, non-executive directors and internal auditors. In addition, Sherer and Kent (1983) suggest that internal audit is the result of bonding costs incurred to fulfil shareholders' demands for accountability. Furthermore, Sarens and Abdolmohammadi (2011), Sarens (2007), Fadzil, Haron and Jantan (2005) and Jensen and Meckling (1976) indicate that the agent (manager) incurs this bonding cost to affirm to the principal (the owner) that every consideration is given to ensure wealth maximisation for the latter party. From this perspective, the cost of internal audit can be judged as a monitoring expenditure incurred by the principals to protect their own economic interest. Thus, agency theory contends that internal auditing helps to maintain a cost-efficient contract between the principals and agents (Adams 1994).

Agency theory also explains why managers demand more monitoring from IAFs particularly for larger and decentralised companies (Maher 1985; Wallace and Kreutzfeldt 1991). The IAF thus fulfils monitoring responsibilities to minimise agency cost (Defond 1992; Anderson, Francis and Stokes 1993). Besides its role in explaining the existence of internal auditing, Adams (1994) suggests that agency theory helps to explain various characteristics of

the internal audit department, for example, its size, scope of activities, etc. These characteristics help to ensure that the IAF operates in a manner which results in better internal control. Internal audit also reduces the principal's information asymmetry problem. Therefore, the existence of internal audit minimises agency cost and ensures a contractual relationship between the two parties (i.e., principal and agent). The agency relationship is dependent on the ownership and control structures of the company and, accordingly, the nature and form of IAFs differ between organisations (Adams 1994, Sarens and Abdolmohammadi 2011). For example, the size, complexity and incentive schemes of organisations affect the nature and form of IAFs including the internal audit outsourcing (IAO) practices of organisations. Adams (1994) illustrates that agency theory explains what types of organisations engage in internal audit outsourcing (IAO) and the reasons behind these decisions. This theory assumes that there is information asymmetry between the principal and the agent which restricts the efficient monitoring capability of the principal. The arrangement of in-house internal auditors is more cost-efficient for an organisation which needs technical and complex knowledge to conduct its activities (e.g., in the insurance industry). Here, the principals can control the agent's activities while the latter can signal that they are acting in the principals' interests. An independent IAF provides assurance to the board, via the audit committee (AC). In this context, agency theory illustrates the independent role and responsibilities assigned to the internal audit function (IAF).

Agency theory assumes that auditing is one of the main monitoring mechanisms to regulate conflicts of interest and reduce agency costs. Therefore, a change in the intensity of agency conflicts should similarly involve a change in the acceptable quality of auditing (Adeyemi and Fagbemi 2010). In respect to internal audit outsourcing (IAO), Caplan and Kirschenheiter (2000) use agency theory to examine outsourcing and reconcile the debate between in-house auditing and outsourcing. Agency theory is used to assess the employment contract of the auditors who are hired to evaluate the company's internal controls and to minimise the moral hazards arising from information asymmetry. Caplan and Kirschenheiter

(2000) consider that the auditor is an economic agent who is able to create an optimal employment contract in these situations and that concern about these hazards influences the decision to outsource.

In summary, agency theory has routinely been used in earnings management research (Klein 2002a; Prawitt, Smith and Wood 2009). In an institutional environment where information asymmetry exists, agents may manipulate the earnings to exhibit better performance in order to meet the expectations of shareholders (Ralph and Zeinab 2003). Information asymmetry results in high agency cost and is positively associated with earnings management. Jiraporn et al. (2008) uses agency theory to distinguish between the opportunistic and beneficial patterns of earnings management. If the agent uses earnings management opportunistically, then the firm where the agency cost is greater should have a higher degree of earnings management. However, if earnings management is used for the beneficial purpose of external stakeholders, it will enhance the information value of earnings and thereby posit a negative relationship between the extent of earnings management and agency cost. Therefore, after investigating the opportunistic and beneficial effects of earnings management, Jiraporn et al. (2008) reported that, on average, earnings management is not detrimental and is beneficial. Jirapon et al.'s (2008) finding is questionable and does not make earnings management more acceptable from a moral perspective. Even if the immediate principals are pleased with the agent's misrepresentation of earnings, other stakeholders will still be deceived.

Thus, agency theory underpins the testable hypotheses developed in this study in terms of the IAF, outsourcing, the AC, the BOD and earnings management.

3.3 Hypotheses Development

3.3.1 Association of corporate governance mechanisms with internal audit function

The internal audit function (IAF) is an integral component of corporate governance. After recent corporate scandals and the Global Financial Crisis, emphasis on the IAF is growing as a way to strengthen the internal control environment as well as corporate

governance (Prawitt, Smith and Wood 2009; Soh and Martinov-Bennie 2011). The current study complements a growing stream of literature investigating the role of the effective audit committee (AC) and effective board of directors (BOD) in internal audit functions (IAFs) including outsourcing.

A growing stream of the literature is examining the association of various elements of an effective AC (i.e., independence, expertise and number of meetings per annum) with determinants of the IAF, such as, internal audit investments, size, objectivity, etc. The current study is conducted in Australia, an institutional environment where corporate governance is less regulated (Von Nessen 2003; Davidson, Goodwin-Stewart and Kent 2005), and in 2011 when establishment of an IAF in Australia was not mandatory. Although some Australian studies (Carey, Simnett and Tanewski 2000; Goodwin-Stewart and Kent 2006) indicate the growing trend towards establishment of an IAF, internal auditing is still poorly represented. This study envisages a very different business environment from that experienced and reported by Goodwin-Stewart and Kent (2006a) for the financial year ended 2000. Many issues have arisen during the past decade necessitating a change in the way that listed companies manage risk and internal controls. Thus, this study investigates the present trend of establishing an IAF in Australia and, in addition, investigates what corporate governance factors (i.e., the AC and BOD) are likely to influence the establishment of an IAF to ensure better management of internal controls and limit the incidence of manipulative practices such as earnings management.

3.3.1.1 Association of audit committee effectiveness with internal audit function

No consensus exists about what constitutes AC effectiveness. Regulators have emphasised that the composition of ACs is important when determining their effectiveness (SEC 1999; Sarbanes - Oxley (SOX) Act 2002; DeZoort, Hermanson and Houston 2003). In structural terms, an effective AC can be described as a committee comprising three characteristics, namely: the percentage of independent directors; employing at least one director possessing financial (including accounting and non-accounting) expertise; and having

at least four meetings per annum (Abbott and Parker 2000; Carcello and Neal 2000; DeZoort and Salterio 2001a; Abbott et al. 2003a; Carcello and Neal 2003; Goodwin-Stewart and Kent 2006). The current study has considered three characteristics as components of an effective audit committee (AC), namely: the percentage of independent directors on the AC; having at least one director possessing appropriate financial (including accounting and non-accounting) expertise; and the number of meetings held per annum. Three of these characteristics are expected to be significantly related to the establishment of an internal audit function (IAF).

Effective ACs rely on the IAF to assist in regard to assurance, independent evaluation of accounting practices and processes, risk analysis, fraud analysis and special investigations (Raghunandan, Rama and Scarbrough 1998; Scarbrough, Rama and Raghunandan 1998; Raghunandan, Read and Rama 2001; Carcello, Hermanson and Neal 2002; Hermanson and Rittenberg 2003; Carcello, Hermanson and Raghunandan 2005b). An effective AC is concerned with the misrepresentation of financial information because this may affect the reputation of AC directors (Beasley 1996; Abbott and Parker 2000; Srinivasan 2005). In order to provide high quality financial reporting, effective oversight by the AC of internal audit activities including internal control systems is necessary. The financial reporting process is thereby strengthened (ASX CGC 1996a; BRC 1999; ASX Corporate Governance Council 2003; Hermanson and Rittenberg 2003). Moreover, internal audit helps the AC in the discharge of its overall responsibilities (Treadway 1987). The IAF works as a supplementary governance mechanism of the audit committee (AC) (Davidson, Goodwin-Stewart and Kent 2005). The Institute of Internal Auditors (IIA) (1993), Scarbrough et al. (1998); Goodwin and Yeo (2001); and Goodwin (2003) therefore state that the goals of the AC and the IAF are closely connected. Regulators have emphasised the importance of this relationship between an effective AC and internal auditing in the financial reporting and corporate governance processes (NACD 1999; SEC 1999, 2002, 2004) and have stated that internal auditing provides a valuable resource for an effective audit committee (AC). Based on these arguments, the

current study expects to identify an association between what constitutes an effective AC and the existence of an internal audit function (IAF).

H_{1a1}: ASX-listed firms with independent audit committee members are more likely to be associated with the existence of an internal audit function.

H_{1a2}: ASX-listed firms with expertise among audit committee members are more likely to be associated with the existence of an internal audit function.

H_{1a3}: ASX-listed firms with frequent audit committee meetings are more likely to be associated with the existence of an internal audit function.

3.3.1.2 Association of board of directors' effectiveness with internal audit function

The BOD forms the apex of a firm's internal governance structure and is therefore recognised as an important control mechanism (Fama and Jensen 1983a, 1983b). The BOD is responsible for ensuring proper internal control by investigating whether the IAF is performed effectively and efficiently in accordance with professional standards (Badawi et al. 2003). Responsibility for overseeing the internal control process and for financial reporting is delegated by the BOD to the members of the audit committee (AC). Thus, the BOD is generally expected to be associated with the establishment and management of the IAF in order to achieve management objectives. The IAF acts as one of the board's principal sources of the information needed to fulfil its oversight responsibilities (Verschoor and Farrell 1996). Directors maintain control over the existence, specific category and performance of the IAF to strengthen internal controls, audit effectiveness and sound corporate governance (Goodwin and Seow 2002). The board's ability to meet these responsibilities depends on its effectiveness. Board effectiveness is an important factor likely to affect the quality of a firm's audit (Lee 2008; Zaman, Hudaib and Haniffa 2011). As in earlier research studies (Jensen 1993; Beasley 1996; Kiel and Nicholson 2003; Jackling and Johl 2009), the current study considers three characteristics (board independence, size and duality) as the chief determinants of board effectiveness.

The above discussion provides support for the following hypotheses relating to the top 500 ASX-listed firms:

H_{Ib1}: ASX-listed firms with independent directors on the board are more likely to be associated with the existence of an internal audit function.

H_{Ib2}: ASX-listed firms with adequate numbers of directors on the board are more likely to be associated with the existence of an internal audit function.

H_{Ib3}: ASX-listed firms with an independent board chair who is different to the person in the role of CEO are more likely to be associated with the existence of an internal audit function.

3.3.2 Association of corporate governance mechanisms with internal audit outsourcing

Earlier research (Mathews, B. Cooper and P. Leung 1995; Rittenberg and Covaleski 1997; Rittenberg, Moore and Covaleski 1999; Carey, Simnett and Tanewski 2000; Martin and Lavine 2000; Subramaniam, NG and Carey 2004) highlights a substantial increasing trend of internal audit outsourcing (IAO) in Australia and abroad. Internal audit outsourcing (IAO) is a lucrative market for public practice firms that are facing challenges to provide value-added and quality services (IIA 1998; Rittenberg and Covaleski 2001; Goodwin-Stewart and Kent 2006).

3.3.2.1 Association of audit committee effectiveness with internal audit outsourcing

A growing stream of recent research (Carcello and Neal 2000; Abbott, Parker and Peters 2004; Abbott et al. 2007) suggests that an effective AC has a role when considering an outsourcing decision. This represents a deviation from prior research studies on outsourcing (Caplan and Kirschenheiter 2000; Widener and Selto 1999) which assumed that management is primarily responsible for the internal audit outsourcing (IAO) decision. The American Bar Association's Blue Ribbon Committee (1999) has recognised that the AC has an important role in the oversight of internal and external audit functions in best practice corporate governance. Based on the regulatory focus, Abbott et al. (2007) stated that an effective AC

has significant influence on the decision to outsource. An effective AC is concerned about misstatements in financial reporting that may cause reputational damage to the firm. To achieve this goal, an effective AC emphasises the need for higher audit quality (Raghunandan, Rama and Scarbrough 1998; Abbott et al. 2003a). Moreover, an effective AC works closely with its IAF in the process of managing relevant internal control structures (Raghunandan, Read and Rama 2001).

An effective AC plays an important role in the outsourcing decision particularly when such arrangements contribute to audit quality (Urbancic 1996a; Gaynor, McDaniel and Neal 2006; Abbott et al. 2007). Subramaniam et al. (2004) similarly support the argument that ensuring internal audit quality (IAQ) is one of the most important reasons for outsourcing IAF activities. As external service providers (e.g., the Big Four accounting firms) are specialised in their particular area, they are able to provide high quality internal audit services at a lower cost (Subramaniam, NG and Carey 2004). Ensuring IAQ is the key category to consider among the three sourcing arrangements; thus, external auditors place more reliance on co-sourcing or outsourcing than on in-house internal audit in regard to assessing internal audit quality (IAQ) among these different sourcing arrangements (Desai, Gerard and Tripathy 2011). Ahlawat and Lowe (2004) report that compared to in-house IAFs, an outsourced internal audit activity is likely to be more objective and independent. In cases where a company is exposed to high inherent risk, external auditors consider that outsourced IAFs ensure better quality outcomes (Glover, Prawitt and Wood 2008). Therefore, considering the costs and benefits associated with different arrangements of internal audit activities, an effective AC would undertake an analysis of these different arrangements to ensure the optimal quality of internal audit services and to make the necessary internal audit outsourcing (IAO) decisions accordingly. Based on these arguments, the current study expects an effective AC to be more likely to be associated with decisions to outsource some internal audit functions (IAFs).

H_{2a1}: ASX-listed firms with independent audit committee members are more likely to be associated with the existence of internal audit outsourcing.

H_{2a2}: ASX-listed firms with expertise among audit committee members are more likely to be associated with the existence of internal audit outsourcing.

H_{2a3}: ASX-listed firms with frequent audit committee meetings are more likely to be associated with the existence of internal audit outsourcing.

3.3.2.2 Association of board of directors' effectiveness with internal audit outsourcing

The BOD is ultimately responsible for the activities and decisions of both management and its audit committee (AC) (Lee 2008). An effective BOD plays a central role in ensuring sound corporate governance and improved firm performance including financial reporting (Jackling and Johl 2009). Goodwin and Seow (2002) add that directors take care of internal audit practices in order to strengthen internal controls, in their pursuit of sound corporate governance. Outsourcing the IAF could decrease the quantity of information that the AC provides to the board (Selim and Yiannakas 2000). This may result in a BOD not engaging in any internal audit outsourcing (IAO) decision that is likely to threaten internal control and audit quality and thus place the firm at greater risk. To this end, an effective BOD will be involved in managing internal audit outsourcing (IAO). Firms without any internal audit function will attempt to outsource internal audit function. Firms then choose to employ internal audit function considering the long term benefits of it and reduce the extent of outsourcing. Outsourcing will occur for some non-routine internal audit activities as per the budget and experience allow. Based on this argument, the current study expects that an effective BOD is associated with the existence of internal audit outsourcing (IAO).

The discussion points raised above provide support for the following hypotheses as they relate specifically to the top 500 ASX-listed firms:

H_{2b1}: ASX-listed firms with independent directors on the board are more likely to be associated with the existence of internal audit outsourcing.

H_{2b2}: ASX-listed firms with adequate numbers of directors on the board are more likely to be associated with the existence of internal audit outsourcing.

H_{2b3}: ASX-listed firms with an independent board chair who is different to the person in the role of CEO are more likely to be associated with the existence of internal audit outsourcing.

3.3.2.3 Association of internal audit quality with internal audit outsourcing

Internal audit quality (IAQ) is extensively covered in the literature that focuses on the quality of corporate governance, including financial reporting, internal control, business ethics and firm performance (Gordon and Smith 1992; Bailey, Gramling and Ramamoorti 2003; Gramling et al. 2004a). Regulators and authoritative guidance (AICPA 1991; IIA 2003; ASA 610) focus on improving the quality of internal audit through qualifications, objectivity, proficiency and due care in internal audit activities. Internal audit outsourcing (IAO) is also a common phenomenon in today's business world. The Institute of Internal Auditors (IIA) (1996, 1994) has stated that outsourcing can be a cost-effective and beneficial way to improve internal audit quality (IAQ). The IAF is best performed by fully resourced and professionally competent staff who are internal and integral to the management structure of an organisation (Selim and Yiannakas 2000). The IIA (1994) also states openly that a competent internal auditing department that is properly organised with trained staff can perform its activities more efficiently and effectively than a contracted audit service. This study attempts to explore the association of IAQ with outsourcing in the sense that a more effective and efficient IAF will over time result in better internal control, good financial reporting and better firm performance, which will lessen the demand for internal audit outsourcing (IAO). With the firm's IAQ measured in terms of certification, experience, training of internal audit staff and size of internal audit team, objectivity of the IAF and time spent on performing financial audits in terms of a totally internal audit, the resources of the in-house facilities will be strengthened to accomplish the task of internal auditing. On the other hand, outsourcing can add value to the corporate governance environment through cost-effective and specialised services. Much depends on a firm's desire and ability to encourage and resource in-house development. Therefore, it is expected that better IAQ is less likely to be associated with more internal audit

outsourcing (IAO). As discussed in Chapter Two, Sections 2.6.1 and 2.6.2, professional internal and external auditing standard SAS No.65 guidance with respect to IAQ factors (AICPA 1991), the following six characteristics are linked with internal audit outsourcing and will be examined individually. All the characteristics of IAQ are associated with IAO in this respect below:

H_{2c1}: ASX-listed firms with professionally certified internal auditors are less likely to be associated with the existence of internal audit outsourcing.

H_{2c2}: ASX-listed firms with experienced internal auditors are less likely to be associated with the existence of internal audit outsourcing.

H_{2c3}: ASX-listed firms with a large internal audit team are less likely to be associated with the existence of internal audit outsourcing.

H_{2c4}: ASX-listed firms with adequate internal audit training are less likely to be associated with the existence of internal audit outsourcing.

H_{2c5}: ASX-listed firms that maintain internal auditors' objectivity are less likely to be associated with the existence of internal audit outsourcing.

H_{2c6}: ASX-listed firms that spend internal audit time performing financial audits are less likely to be associated with the existence of internal audit outsourcing.

3.3.3 Association of corporate governance mechanisms with extent of internal audit outsourcing

Examining the association between important corporate governance mechanisms (i.e., an effective AC and BOD) and the extent of internal audit outsourcing (IAO) is another way to investigate the relationship between these arrangements. The quality of the IAF is inextricably linked to its use of outsourcing facilities. Many of the non-routine functions require the expert attention of experienced professionals, trained in duties applicable to the needs of the particular industry. Other factors, such as size limitations, company policy and the timing of certain functions, for example, specialised IT functions and forensic reviews also justify extending the IAF beyond its normal capacity. The extent of outsourcing will

necessarily be a function determined by the board's demand for quality services that are not readily available within the firm.

3.3.3.1 Association of audit committee effectiveness with extent of internal audit outsourcing

A company can be involved in fully outsourcing or co-sourcing its internal audit function (IAF). External auditors, investors and financial investors prefer co-sourcing or outsourcing to a fully in-house IAF with the former two believed to provide better quality internal audit services (Smith 2002; Desai, Gerard and Tripathy 2011; Thomas and Parish 1999; Del Vecchio and Clinton 2003). An effective AC plays an influential role in the outsourcing decision as part of its mandate to provide better internal audit quality (IAQ) (Urbancic 1996a; Subramaniam, NG and Carey 2004; Gaynor, McDaniel and Neal 2006; Abbott et al. 2007). An effective AC demands higher audit quality (Raghunandan, Rama and Scarbrough 1998; Abbott et al. 2003a), which leads to the assumption that an effective AC will not influence the decision to fully outsource internal quality if this decision places the firm at greater risk. It is therefore anticipated that an effective AC will influence the decision as to what extent its company is involved with outsourcing on particular occasions and as part of its forward planning. Moreover, examining the association of an effective AC with the extent of outsourcing is an additional investigation once the existence of outsourcing is located. Instead of using dummy values of (1, 0) for existence, continuous values of the extent of outsourcing are examined with the effective AC characteristics.

The discussion points raised above provide support for the following hypotheses as they relate specifically to the top 500 ASX-listed firms:

H_{3a1}: ASX-listed firms with independent audit committee members are positively associated with the extent of internal audit outsourcing.

H_{3a2}: ASX-listed firms with expertise among audit committee members are positively associated with the extent of internal audit outsourcing.

H_{3a3}: ASX-listed firms with frequent audit committee meetings are positively associated with the extent of internal audit outsourcing.

3.3.3.2 Association of board of directors' effectiveness with extent of internal audit outsourcing

An effective BOD provides additional support for outsourcing, assuming that such decisions do not threaten internal control, audit quality or place the firm at greater risk. As discussed in Chapter Two, Section 2.4, outsourcing of specific types of internal audit activities to some extent is considered beneficial to the firm (IIA 1996, 1994; Abbott et al. 2007). Hall and Liedtka (2007) maintain that in-house IAFs concentrate attention on financial and compliance audits that are essential for the management of internal controls and are best applied for that purpose. Therefore, it is contended that an effective BOD is less likely to be interested in complete outsourcing. The extent to which an IAF is outsourced is therefore a function of the policies of an effective BOD and AC and deserves to be measured:

H_{3b1}: ASX-listed firms with independent directors on the board are positively associated with the extent of internal audit outsourcing.

H_{3b2}: ASX-listed firms with adequate numbers of directors on the board are positively associated with the extent of internal audit outsourcing.

H_{3b3}: ASX-listed firms with an independent board chair who is different to the person in the role of CEO are positively associated with the extent of internal audit outsourcing.

3.3.3.3 Association of internal audit quality with extent of internal audit outsourcing

The current study aims to further extend the exploration of the association of IAQ with the extent of outsourcing. In addition, a substantial qualitative review of the extent and nature of outsourcing for the companies with an IAF is provided in Chapter Five. The measure of the extent of outsourcing ranges from 0–100%. Referring to the rationale given in subsection 3.3.2.3 of this chapter, the IAF that ensures better IAQ with fully resourced internal audit staff and facilities will tend to limit any reliance on outsourcing. Six individual factors of IAQ are associated in a similar way with the extent of outsourcing as follows:

H_{3c1}: ASX-listed firms with professionally certified internal auditors are negatively associated with the extent of internal audit outsourcing.

H_{3c2}: ASX-listed firms with experienced internal auditors are negatively associated with the extent of internal audit outsourcing.

H_{3c3}: ASX-listed firms with an internal audit team that is large in size are negatively associated with the extent of internal audit outsourcing.

H_{3c4}: ASX-listed firms with adequate internal audit training are negatively associated with the extent of internal audit outsourcing.

H_{3c5}: ASX-listed firms that maintain internal auditors' objectivity are negatively associated with the extent of internal audit outsourcing.

H_{3c6}: ASX-listed firms that spend internal audit time performing financial audits are negatively associated with the extent of internal audit outsourcing.

3.3.4 Association of internal audit function with earnings management

The IAF is an integral component of a high quality corporate governance structure (Treadway 1987; Hermanson and Rittenberg 2003; Skousen, S.M. Glover and D.F. Prawitt. 2005; IIA 2005a). The IAF has in recent years received greater attention from regulators and academics in terms of its contribution to quality external financial reporting and hence to effective corporate governance (Prawitt, Smith and Wood 2009). The role of internal audit in relation to financial reporting is to ensure compliance with reporting requirements and maintain the credibility and truthfulness of financial statements (Dechow et al. 1995). Researchers have investigated the role of the IAF as a monitoring mechanism of corporate governance (Treadway 1987; Anderson, Francis and Stokes 1993; Hermanson and Rittenberg 2003; Skousen, S.M. Glover and D.F. Prawitt. 2005) that is expected to influence the extent to which businesses undertake earnings management.

A few studies have found that AC and/or BOD characteristics are negatively related to earnings management (Peasnell, Pope and Young 2000; Chtourou, Bedard and Courteau 2001; Klein 2002a; Xie, Davidson and DaDalt 2003). While examining earnings management, this study considers AC and BOD characteristics as control variables which have been variously examined by others. Davidson, Goodwin-Stewart and Kent (2005) conducted a cross-sectional

analysis of 434 ASX-listed firms for the financial year ended 2000: they reported that having a majority of non-executive directors on the board and on the AC is significantly related to a lower likelihood of earnings management, but the establishment of internal and external audit are not significantly related to a reduction in the level of earnings management.

The earlier literature emphasises the value-added role of the IAF and focuses on the financial reporting process and earnings management (Schneider and Wilner 1990; Birkett et al. 1999; Eighme and Cashell 2002; Martin et al. 2002; Rezaee 2002; Clikeman 2003; Hala 2003; Davidson, Goodwin-Stewart and Kent 2005; Asare, Davidson and Gramling 2008; Coram, Ferguson and Moroney 2008). Internal auditors should review senior management's activities including the manipulation of earnings in order to achieve targets and receive financial rewards (Hala 2003). Asare, Davidson and Gramling (2008) similarly suggest that internal audit plays an active role in decreasing management's aggressive accounting behaviour. Rogers and Stocken (2005), Schwartz and Young (2002), Hunton, Libby and Mazza (2006) and Brown and Pinello (2007) also support the arguments that the IAF identifies management bias in financial reporting. Being complementary to external audit, internal audit should not only be involved in detecting earnings management but also should take a proactive approach to educate managers and directors about the problems they create for others (Clikeman 2003; Eighme and Cashell 2002, Schneider and Wilner 1990). All the above arguments specify the significance of the IAF in deterring earnings management and suggest a negative association between the existence of an IAF and earnings management. Auditing Standard (AUS) 210 (Australian Accounting Research Foundation 2004) and later Australian Auditing Standard (ASA) 240 (Auditing and Assurance Standards Board 2006) emphasise the duties of internal audit in detecting fraud and raising awareness of fraud. In addition, the ASX CGC (2007) strongly supports the establishment of IAFs in listed companies, particularly in larger companies. In the latest ASX CGC's CGP&R released in March 2014, the status of internal audit as part of Recommendation 7.3 (about how to recognise and manage risk) has been raised and firms are strongly recommended to have an IAF and to disclose how the

function is structured and what role it performs. Thus, top Australian-listed companies are more likely to have an internal audit function (IAF). It is therefore expected that the existence of IAFs in ASX-listed firms (the top 500) will influence earnings management. To determine this, the following hypothesis is tested:

H₄: ASX-listed firms with an internal audit function are negatively associated with earnings management.

3.3.5 Association of internal audit outsourcing with earnings management

By examining the establishment of an IAF with the incorporation of internal audit outsourcing (IAO) in relation to earnings management, this study will extend the study by Davidson, Goodwin-Stewart and Kent (2005). Not only is outsourcing a new phenomenon in internal audit practices, there is an increasing trend worldwide towards outsourcing.

This research has explored internal audit practices by extending the association of existence of internal audit outsourcing with earnings management. A further contribution is the inclusion of internal audit quality as explanatory variables that are likely to be associated with reduction of earnings management for the companies having internal audit function.

The strong recommendation of the ASX CGC to listed companies, and particularly to those that are larger, to establish an IAF has resulted in many larger and medium-sized publicly-traded companies in Australia having some sort of internal audit function (IAF). With respect to those companies where the IAF is performed in-house or outsourced, the current study investigates the effect of the quality of the IAF on external financial reporting. In addition, some IAQ factors (e.g., IAF size and IAF experience) are adjusted with the effects of outsourcing. The quality of the IAF will vary widely depending on the investment and use of the IAF (in-house or outsourced). Empirical researchers (Rogers and Stocken 2005; Schwartz and Young 2002; Hunton, Libby and Mazza 2006; Brown and Pinello 2007) also support the role of an effective IAF in mitigating management's undue influence or bias towards the manipulation of earnings figures. This argument suggests the association between a high quality IAF and earnings management. Thus, earnings management may be influenced

by the decision to undertake IAO which facilitates internal audit quality (IAQ). Based on this argument, the following hypothesis is established.

H₅: ASX-listed firms with internal audit outsourcing are negatively associated with earnings management.

3.3.6 Association of extent of internal audit outsourcing with earnings management

This study will further explore internal audit practices by extending the association of the extent of IAO with earnings management. This is another way to analyse how the outsourcing decision influences financial reporting. Instead of using the existence of outsourcing which is a dichotomous variable, this hypothesis has used the extent of outsourcing which is a continuous variable. A further contribution is the inclusion of IAQ as explanatory variables that are likely to be associated with a reduction of earnings management for companies involved with outsourcing to any extent (e.g., fully outsourcing, co-sourcing or fully in-house). Therefore, the following hypothesis is developed to examine the relationship between the extent of outsourcing and earnings management:

H₆: ASX-listed firms with any extent of internal audit outsourcing are negatively associated with earnings management.

3.3.7 Association of internal audit quality with earnings management

The IAF is an important corporate governance mechanism (IIA 2005a). Recent scandals and inappropriate accounting practices (e.g., Enron, WorldCom, HealthSouth, Qwest, Rite Aid, Tyco, Waste Management Inc. and Xerox) have emphasised the role of internal audit in true and fair financial reporting (Prawitt, Smith and Wood 2009). The empirical studies (Rogers and Stocken 2005; Schwartz and Young 2002; Eighme and Cashell 2002; Martin et al. 2002; Rezaee 2002; Clikeman 2003; Hala 2003) have emphasised the monitoring role of internal audit and the practice of reporting the company's true financial information. Internal audit is likely to effectively accomplish this monitoring responsibility to ensure that earnings have not been manipulated and falsely reported. High quality internal auditors work as an

additional third party to monitor management actions and detect fraudulent financial reporting (Prawitt, Smith and Wood 2009). Hala (2003) and Clikeman's (2003) findings indicate that internal audit size and qualifications and the experience of internal audit staff will contribute to better IAQ and will lessen fraudulent financial reporting. Although external audit is more associated with earnings management, the IAF also influences financial reporting through its presence as an independent oversight.

Internal auditors work in association with the AC to ensure better internal control and reporting. The current study will further explore the association of each of the components of IAQ with earnings management with or without any form of outsourcing. The following hypotheses are developed to investigate the association of IAQ with earnings management:

H_{7a}: ASX-listed firms with professionally certified internal auditors are negatively associated with earnings management.

H_{7b}: ASX-listed firms with experienced internal auditors are negatively associated with earnings management.

H_{7c}: ASX-listed firms with an internal audit team that is large in size are negatively associated with earnings management.

H_{7d}: ASX-listed firms with adequate internal audit training are negatively associated with earnings management.

H_{7e}: ASX-listed firms that maintain internal auditors' objectivity are negatively associated with earnings management.

H_{7f}: ASX-listed firms that spend internal audit time performing financial audits are negatively associated with earnings management.

A list of all the hypotheses is provided in Appendix B at the end of this study.

3.4 Conceptual Schema

The conceptual schema is presented below in Figure 3.1.

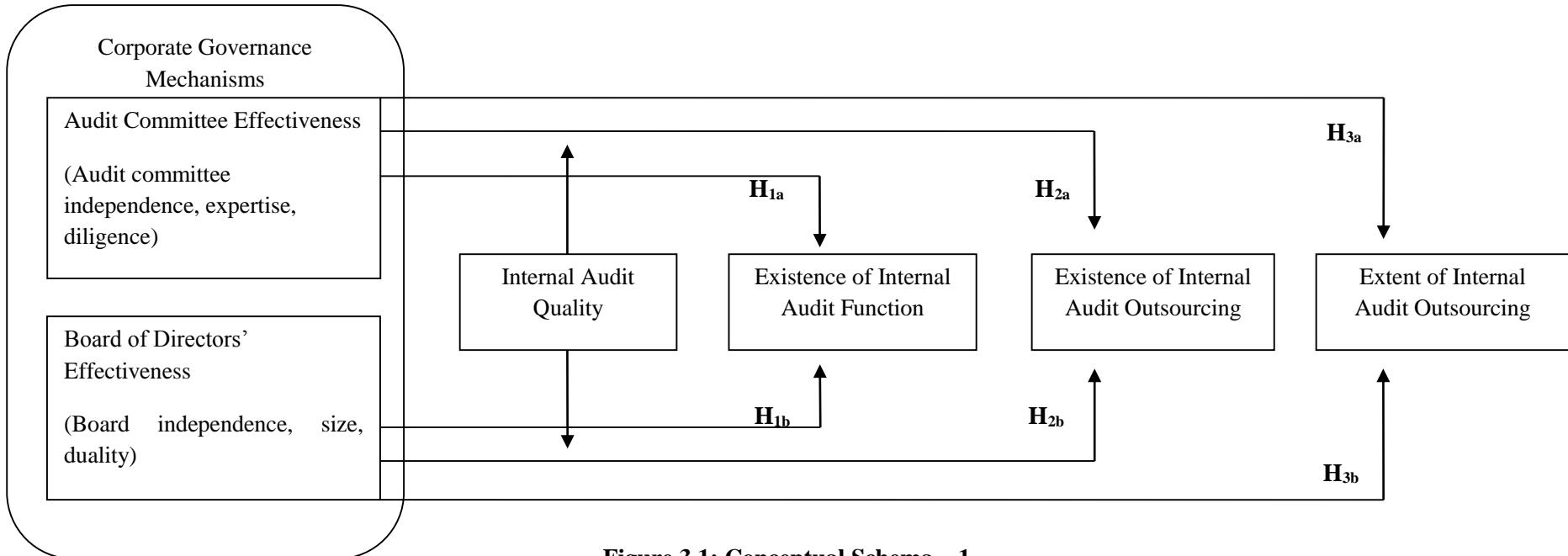


Figure 3.1: Conceptual Schema – 1

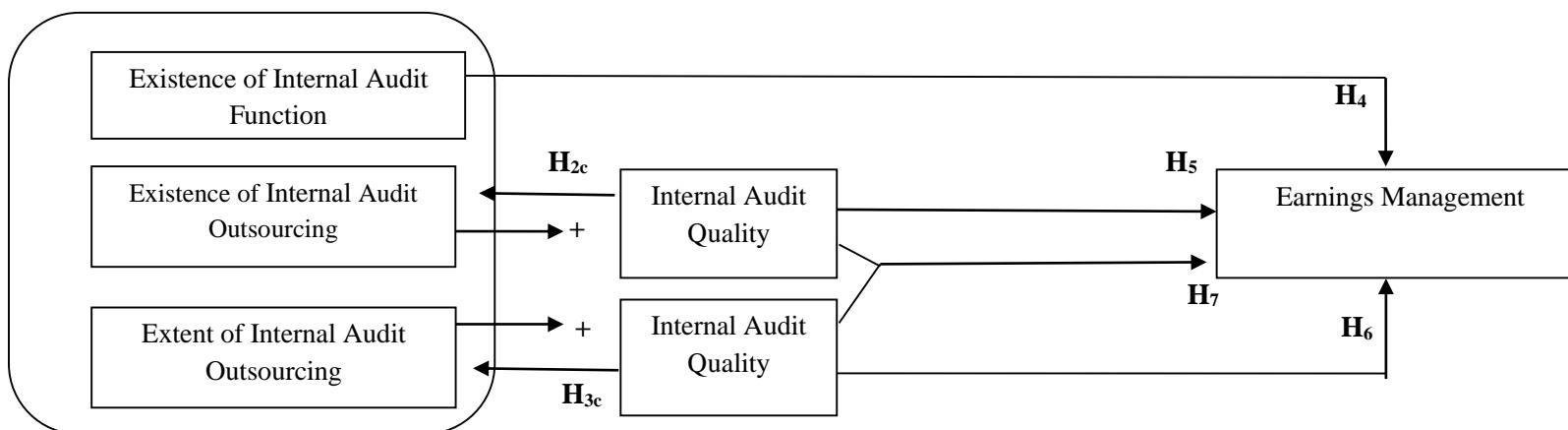


Figure 3.2: Conceptual Schema – 2

The conceptual schema presented in Figures 3.1 and 3.2 represents the set of testable hypotheses which are established in relation to the prior literature. Figure 3.1 first shows the three testable hypotheses that depict the association expected between corporate governance mechanisms (effective audit committee [AC] and effective board of directors [BOD]) and three dependent variables (existence of internal audit function [IAF], existence of internal audit outsourcing [IAO] and extent of internal audit outsourcing [IAO]) that represent the internal audit practices of the company. Figure 3.2 then shows the last three testable hypotheses representing the association between internal audit practices (existence of internal audit function [IAF], existence of internal audit outsourcing [IAO] and extent of internal audit outsourcing [IAO]) and earnings management. Hypotheses 5 and 6 expect that the existence and extent of internal audit outsourcing (IAO) will influence internal audit quality (IAO) which accordingly will influence earnings management.

3.5 Summary of the Chapter

This chapter has used agency theory as the theoretical framework to discuss the importance of internal audit, internal audit outsourcing (IAO), the audit committee (AC) and the board of directors (BOD) in corporate governance research. Agency theory is also used to discuss the rationale of including earnings management in the current study. In this chapter, a set of testable hypotheses was developed and examined in reference to the earlier literature to show whether or not the expected association between the variables exists. The figures of the conceptual schema (Figures 3.1 and 3.2) were presented to depict the relationship in a pictorial format at the end of the chapter.

Chapter Four discusses in detail the research methodology used to test the study's hypotheses. Detailed information on the processes of sample selection, time period selection and primary and secondary data collection are provided. Furthermore, the chapter includes a comprehensive study of how various variables are measured and validated for analysis purposes. The processes of statistical analysis are also included in Chapter Four.

Chapter Four: Research Methodology

4.1 Overview of the Chapter

Chapter Three discussed the theoretical framework used to test the hypotheses of this study. Agency theory is used to discuss the issues of internal audit, outsourcing, corporate governance mechanisms and earnings management. The chapter then discussed all the testable hypotheses and the related literature to justify the associations of the hypotheses. Finally, a conceptual schema was presented to outline the key relationships between the various variables.

This current chapter provides details of the research methods that were followed to test the hypotheses of this study. The chapter starts by discussing the selection of the sample and time period followed by source documentation and data collection. The data collection discussion explains in detail the two different stages, namely, data collected from primary and secondary sources. Subsequent sections of this chapter discuss the measurement of all the dependent and independent variables used in the study. The measurement of control variables along with the justification for using the variables in different models are discussed in a later section. Finally, the chapter discusses the statistical analysis and the additional sensitivity analysis with the chapter concluding with the summary.

4.2 Sample and Time Period Selection

The following subsections provide justification of the processes used in the selection of the sample and time period.

4.2.1 Sample selection

The initial sample includes the top 500 ASX-listed companies (according to market capitalisation) for the financial year 2011. The list of the top 500 companies is taken from the total list of ASX publicly-listed firms (1,546) after excluding the following categories. Firstly, as is consistent with prior studies (Simunic 1980; Klein 2002a; Davidson, Goodwin-Stewart and Kent 2005), all financial firms (e.g., banks, trusts, insurance, stock brokerage, etc.) are

excluded as these are subject to more unique and stricter regulatory requirements. Next, foreign incorporated firms are excluded because different financial reporting and disclosure requirements apply to them (Clifford and Evans 1997). In addition, firms that are not continuously listed or that were suspended during the financial year 2011 are excluded to avoid the undue influence of unexpected changes in share price. Lastly, a few firms are excluded as data are missing or their data are unavailable on Morningstar DatAnalysis and FinAnalysis databases, and in annual reports.

In Australia, the top 500 ASX-listed firms (making up the All Industries Index) are to establish an audit committee (AC) and the Financial Reporting Council (FRC) is required to have oversight over audit independence, giving auditing standards the same force as accounting standards. The top 500 companies are selected because larger companies are more likely to have an internal audit function (IAF). Earlier studies have highlighted that firm size is positively associated with investment in internal auditing (Carcello, Hermanson and Raghunandan 2005b; Anderson et al. 2012). Also, the top 500 ASX-listed companies represent approximately 98% of the total assets of all 1,546 ASX-listed companies.

From the initial population of 500 companies, questionnaire responses were received from 111 with a response rate of 22.2%. No significant differences were observed in terms of structure and function between early and late respondents. One-third of the remaining non-responding 389 companies were randomly chosen from annual report data, which increased the usable sample by 129 companies. This random sample of 129 that failed to respond to the questionnaire was examined to determine whether their annual reports provide any information about their investment in internal audit and outsourcing. The usable sample therefore included (111+129) 240 ASX-listed companies with a response rate of 48% or almost one-half of all top 500 firms.

In summary, 240 firm data were used to test Hypotheses 1 and 4, while 60 firms (out of 111) provided sufficient information to permit the testing of remaining Hypotheses 2-3 and 5-7 inclusive (refer to Appendix B for details).

4.2.2 Time period selection

This study focuses on the financial year 2011 for collection of data from the top 500 ASX-listed companies. From 2010, the Australian economy and share market started to recover from the effects of the Global Financial Crisis and the downturn of 2008 and 2009. The financial year 2011 would reflect a stable Australian economic environment in which to investigate corporate governance practices. In 2007, the ASX CGC released its Corporate Governance Principles and Recommendations (CGP&R) which revised the original edition of 2003. This revision included recommendations on corporate governance practices to the ASX-listed companies and especially to the top 500 firms. It is considered that the changes in corporate governance practices after these reforms would be reflected in the data from the financial year 2011.

4.3 Source Documentation and Data Collections

The following subsections provide details of the primary and secondary data sources and the processes of data collection.

4.3.1 Primary data collection

This study primarily uses the questionnaire survey method for primary data collection. As information about internal audit and outsourcing is not publicly available, it is an appropriate method to collect the inside information. Earlier studies (Scarborough, Rama and Raghunandan 1998; Goodwin and Yeo 2001; Goodwin 2003, 2004; Carcello, Hermanson and Raghunandan 2005b; Goodwin-Stewart and Kent 2006; Abbott et al. 2007; Abbott, Parker and Peters 2010; Anderson et al. 2012) used the same method of data collection for primary data collection. In the first stage, a questionnaire was developed and circulated to the ‘Head of Internal Audit Function’, the person in the best position to answer questions about internal audit practices.

Questionnaires were mailed to respondents in two phases. In the first phase, questionnaires were mailed to the top 500 ASX-listed companies in late October 2012. A

record was kept tracking the number of questionnaires sent and the responses received during the first phase and the reminder phase. A gentle reminder letter was sent to respondents after four weeks which helped to increase the response rate. Respondents were given a total of eight weeks to respond. If any responses were received after this time period, they were not included in the study. Due to the relatively low response rate, the second phase of the questionnaire survey was circulated online to the ‘Chief Audit Executive (CAE)’ with the help of the Institute of Internal Auditors (IIA) Australia in April 2013. IIA Australia then circulated the online questionnaire to the selected CAE from the IIA’s member list. An online questionnaire and a survey link were created using Qualtrics. In this phase, the online questionnaire was electronically sent by IIA Australia in an email together with an information sheet and the online link to the questionnaire. In both phases of the questionnaire survey, respondents chose whether or not to answer the questions and also whether or not to comment on any additional issues, if they desired.

4.3.1.1 Questionnaire design

Questionnaire design involves the review of prior literature to prepare an appropriate construction that addresses the research instruments. The questionnaire design and structure in the current study followed those used in earlier studies (Felix Jr, Gramling and Maletta 2001; Goodwin and Yeo 2001; Goodwin 2004; Carcello, Hermanson and Raghunandan 2005b; Goodwin-Stewart and Kent 2006; Abbott et al. 2007).

A well-formatted questionnaire is less likely to mislead respondents and helps to improve the response rate. When designing the questionnaire, a number of important factors were considered. Firstly, it was acknowledged that the target respondents (Heads of Internal Audit) were extremely busy people. Therefore, the questionnaire size was limited to motivate respondents to participate and to be able to answer the required questions within a minimal time period. Secondly, most of the questions were not open-ended. The questions were mostly in multiple choice formats which again facilitated a quick response. Thirdly, information regarding the internal audit function (IAF) is private and is not normally disclosed to external

parties; therefore, respondents were asked questions that were relatively non-sensitive and easy to answer thus limiting the need to reference other data sources. All of these issues were considered carefully during the design phase.

4.3.1.2 Pilot study

Pilot studies help to detect weaknesses in the design of research instruments and improve the feasibility and reliability of questionnaires. This study included a pilot study before the questionnaire survey was finalised. The pilot study involved academics and practitioners (particularly Heads of Internal Audit) with internal audit experience and knowledge, with their input helping to improve the questionnaire content and design. Responses were received from six academics and five practitioners out of a total of 20 participants to whom the questionnaire were circulated for the pilot study. Most comments were about the content of the questionnaire, the way in which information was sought and questions were asked, etc. After receiving the participants' comments and suggestions, the questionnaire was revised accordingly.

4.3.1.3 Questionnaire information sheet

The instrument included an information sheet with the questionnaire to provide the objectives of the research study, the content of the questionnaire and the benefits of participation. The information sheet explained that primary data from the questionnaire would be linked with secondary information from the company's annual report. It also explained that participation in the survey was voluntary, and that confidentiality of the questionnaire information and anonymity of respondents would be maintained. Postage-paid envelopes were provided for respondents' convenience. The information sheet included a paragraph stating that the project had been approved by the Curtin University Human Research Ethics Committee. For any concerns or further information, respondents were encouraged to contact the researchers and/or supervisors. A sample of the information sheet is attached in Appendix A.

4.3.1.4 Questionnaire content

The questionnaire included four parts (Parts A–D). A short description of each part is provided in the following paragraphs.

Part A of the questionnaire begins with one initial question about the existence/non-existence of the internal audit function (IAF). Company officers reviewing the contents of the questionnaire could provide a response without reading any further. If the respondent company has an internal audit function (IAF) (in-house or outsourced), they are then asked to continue answering the questions; otherwise, they are asked to tick the ‘No’ option and immediately post the questionnaire back to the researcher. Relatively few companies, either in their annual reports or online, include information about whether or not they employ internal audit.

Part B of the questionnaire requires respondents to provide general information about themselves in the role of Chief Audit Executive or in an equivalent position. This part includes six common questions that are similar to those used by Scarbrough, Rama and Raghunandan (1998), Goodwin (2003) and Abbott, Parker and Peters (2010). Respondents are required to provide basic demographic information about their position, qualifications and years of internal audit experience. This part also includes questions about reporting responsibility and accessibility to the audit committee (AC).

Part C of the questionnaire includes seven questions relating to the internal audit structure of the company. These questions were prepared based on the questionnaires used in Goodwin and Yeo (2001), Raghunandan, Read and Rama (2001), Goodwin (2003) and Abbott, Parker and Peters (2010). The first question in this part concerns the number of years for which the company has had an internal audit function (IAF). Respondents are asked to provide further information regarding the number of internal audit staff, including those who are professionally qualified staff, the number of years of internal audit experience and the adequacy of training. The remaining two questions refer to the size of the internal audit function (IAF) and outsourcing. Information on the internal audit structure is essential to measure the variables used in assessing internal audit quality (IAQ).

Part D of the questionnaire includes questions about internal audit outsourcing (IAO). The first question is whether the company outsourced or co-sourced any internal audit activities during the financial year ended 2011. Companies with internal audit outsourcing (IAO) are further asked to answer questions relating to the size, types, reasons, future plans in relation to outsourcing, and service providers to whom they have outsourced. Question 5 of Part D is about the nature (routine or non-routine) of some common internal audit activities along with additional indications about whether or not these specific activities were outsourced and the percentage of total internal audit time spent on performing these activities. Companies with no internal audit outsourcing (IAO) are asked to provide their reasons for not using this service and whether they have any future intentions to do so. The last question in the questionnaire is an open-ended question that asks respondents to comment on any questions or issues relevant to the study. Part D of the questionnaire seeks additional qualitative information relating to internal audit outsourcing (IAO). In the questionnaire, Parts C and D initially had a focus on outsourcing information but later, taking into consideration the responses from respondents, the study adjusted the research objectives.

4.3.2 Secondary data collection

This subsection discusses the methods of secondary data collection from the top 500 ASX-listed companies for the financial year ended 2011. All the financial and non-financial data specifically relating to the research objectives, including the control variables, were collected by hand from annual reports and financial databases (Aspect Huntley's FinAnalysis and DatAnalysis) and linked with primary data collected from the questionnaire survey. A random sample of one-third (129) comprising the companies that failed to respond to the questionnaire was examined to determine whether their annual reports provide information about their investment in internal audit and outsourcing.

Non-financial data relating to audit committees (ACs) and boards of directors (BODs) were also gathered from directors' reports, corporate governance statements and board profiles in annual reports. Some data were also collected from the charters of audit committees (ACs)

relating to the composition of the AC, its basic framework and structure. All financial data used to calculate earnings management were gathered from the FinAnalysis database. Other financial data on firm characteristics (e.g., firm size, risk, complexity, growth, age, etc.) and audit firm quality were gathered from DatAnalysis and FinAnalysis databases.

4.4 Measurement of Dependent Variables

The study examines two categorical and two continuous criterion variables as part of the research agenda. The definition, measurement and justification of these variables are discussed below.

4.4.1 Existence of internal audit function (IAF)

‘Existence of internal audit function’ (*IAF*) is included as a dependent variable to examine its association with corporate governance characteristics in Hypotheses H_{1a1}, H_{1a2} and H_{1a3}, and H_{1b1}, H_{1b2} and H_{1b3}, referring to Chapter Three, subsection 3.3.1. This is a criterion variable with one of two possible values, namely a value of 1 if an internal audit function exists within the listed company, otherwise 0 if an internal audit function does not exist. Information on the existence of an internal audit function is collected from both the questionnaire survey and annual reports from selected companies. In the questionnaire, the first question checked for the existence of an internal audit function (in-house or outsourced) in the financial year 2011. A total of 111 responses were received from questionnaire respondents indicating companies either with or without an internal audit function. In order to supplement the number of survey respondents, annual reports from an additional 129 companies were randomly selected and the contents checked for any information about the existence of an internal audit function. Although disclosure of internal audit information is not mandatory in Australia, since 2005, the ASX has required companies to disclose their risk management mechanism (Singh and Newby 2010). This disclosure helps to identify which corporate governance mechanisms (including internal audit, the board, the audit committee or management) are used to manage

the risk and thus provides information about the existence of an internal audit function in the company.

This study is one of very few studies to focus on the existence of an internal audit function (Wallace and Kreutzfeldt 1991; Carey, Simnett and Tanewski 2000; Goodwin-Stewart and Kent 2006), as was discussed in Chapter Two, subsection 2.2.3 and Chapter Three, subsection 3.3.1. Other studies (Carcello, Hermanson and Raghunandan 2005b; Barua, Rama and Sharma 2010; Sarens and Abdolmohammadi 2011; Anderson et al. 2012) have been conducted on internal audit size (in terms of the number of internal audit staff and the internal audit budget), factors related to the establishment of an internal audit function, internal audit quality, etc. in different contexts. Australia has a different institutional environment at present, compared to the USA and UK, with the establishment of an internal audit function not mandatory, although it is strongly recommended by the ASX CGC (2010) for listed companies. Corporate regulators follow a principles-based approach rather than a rules-based approach in terms of the establishment of an internal audit function (ASX 2003). Therefore, this study focuses only on the existence of an internal audit function.

‘Existence of internal audit function (*IAF*)’ will also be used as an independent variable when examining earnings management in Hypothesis H₄, referring to Chapter Three, subsection 3.3.4. Internal audit is believed to add value through improving the monitoring and control environment of the company which helps to detect and minimise the use of discretionary accruals (Davidson, Goodwin-Stewart and Kent 2005; Coram, Ferguson and Moroney 2008).

4.4.2 Existence of internal audit outsourcing (*IAO*)

‘Existence of internal audit outsourcing’ (*IAO*) is another dependent variable used in the study to examine its association with corporate governance characteristics and internal audit quality in Hypotheses H_{2a1}, H_{2a2} and H_{2a3}, and H_{2b1}, H_{2b2} and H_{2b3}, referring to Chapter Three, subsection 3.3.2. In the first instance, this variable is assigned a variable categorical element and given a value of 1 if the company outsources the internal audit function, otherwise

0. Information on internal audit outsourcing was obtained from only 60 questionnaire responses. Part D of the questionnaire asked respondents about the existence of outsourcing (partly or fully) during the financial year ended 2011. As disclosure of internal audit outsourcing information is not mandatory in Australia, only questionnaire responses were taken into consideration. ‘Existence of internal audit outsourcing (*IAO*)’ is also used as an independent variable with earnings management in Hypothesis H₅, referring to Chapter Three, subsection 3.3.5. Earlier studies (Coram, Ferguson and Moroney 2008; Prawitt, Smith and Wood 2009; Brandon 2010) report that whether firms engage in complete, partial or no outsourcing has a different influence in terms of detecting earnings management.

Earlier studies (for example, Mathews, Cooper and Leung 1993; Rittenberg and Covaleski 1997; Rittenberg, Moore and Covaleski 1999; Carey, Simnett and Tanewski 2000; Martin and Lavine 2000; Subramaniam, NG and Carey 2004) highlight the substantial increasing trend of internal audit outsourcing in Australia and abroad. This study focuses only on the existence and extent of outsourcing as associated with two important corporate governance mechanisms.

4.4.3 Extent of internal audit outsourcing (ExtentIAO)

‘Extent of internal audit outsourcing’ (*ExtentIAO*) is used as a dependent variable in Hypotheses H_{3a1}, H_{3a2} and H_{3a3}, and H_{3b1}, H_{3b2} and H_{3b3}, referring to Chapter Three, subsection 3.3.3 to analyse the association with corporate governance characteristics and internal audit quality. This is a continuous variable measured in terms of the percentage of internal audit outsourcing. Data for this variable were collected only from Part C, Question 7 of the questionnaire. This question asked about the approximate expenditure on outsourcing. The percentage of outsourcing was later calculated by dividing the expenditure on outsourcing by the total expenditure on internal audit. These data are further supported by responses to Question 2 of Part D of the questionnaire. Due to the unavailability of the required information, annual reports were not used to collect information on the extent of internal audit outsourcing.

However, consistent with the prior literature, the extent of internal audit outsourcing was not transformed into logarithm (log) format or another format to confirm normality.

Carey et al. (2006) used the extent of internal audit outsourcing to analyse its association with firm characteristics (firm size, cost, technical competence and strategy). Unlike the study by Abbott et al. (2007) which examined whether an effective audit committee influences the extent of internal audit outsourcing, Carey et al.'s (2006) study focused on board effectiveness along with audit committee effectiveness to analyse their effect on the extent of internal audit outsourcing.

4.4.4 Discretionary accruals (DAC)

The extent of internal audit outsourcing influences earnings management. Prior studies have supported partial outsourcing rather than complete outsourcing (James 2003; Ahlawat and Lowe 2004; Coram, Ferguson and Moroney 2008). Partial outsourcing adds more value within the internal control and monitoring system that helps to effectively detect earnings management. Companies with complete outsourcing are less likely to detect and report misleading financial information.

'Discretionary accruals' (DAC) is used as a dependent variable construct in Hypotheses H₄, H₅ and H₆, referring to Chapter Three, subsections 3.3.4 to 3.3.6. These hypotheses analyse the association of earnings management with the existence of internal audit and outsourcing, and the extent of internal audit outsourcing. The variable *DAC* is used as a proxy to measure earnings management in the current study. All the data needed to calculate discretionary accruals were downloaded from FinAnlaysis Morningstar database. Earlier studies (Peasnell, Pope and Young 2000; Klein 2002a; Bradbury, Mak and Tan 2006) examined the association of the audit committee and board of directors with earnings management. This study will go a step further and analyse the effect of internal audit and internal audit outsourcing along with internal audit quality on earnings management.

This study uses the Modified Jones model, one of the most widely used constructs to measure discretionary accruals. This model partitions total accruals into discretionary and non-

discretionary components (Dechow, Sloan and Sweeney 1995). While making this subdivision of total accruals, it is assumed that high application levels of discretionary accruals implies higher earnings management (Davidson, Goodwin-Stewart and Kent 2005). The modification in Jones model is designed to eliminate the questionable tendency of measuring discretionary accruals when discretion is exercised over revenue (Dechow, Sloan and Sweeney 1995). The Modified Jones model is similar to its precursor except an adjustment is made in changes in revenues with the changes in receivables and level of property, plant and equipment, which drive working capital and depreciation respectively (Davidson, Goodwin-Stewart and Kent 2005).

As in earlier studies (DeFond and Jiambalvo 1994; Becker et al. 1998; Bartov, Gul and Tsui 2000; Peasnell, Pope and Young 2000; Davidson, Goodwin-Stewart and Kent 2005; Rusmin 2010), the cross-sectional modified Jones model is used in this study. First, total accrual (herein TAC_i) of firm i for financial year 2011 is measured as the change in non-cash current assets less the change in operating current liabilities less depreciation and amortisation expenses. Thus, TAC_i is calculated using the balance sheet approach including the use of income statement data. For the financial year 2011,

$$TAC_i = (\Delta CA_i - \Delta Cash_i) - (\Delta CL_i - \Delta LTD_i - \Delta ITP_i) - DPA_i \quad [1]$$

where:

TAC_i = Total accruals of firm i ;

ΔCA_i = Change in current assets of firm i from the beginning until the end of 2011;

$\Delta Cash_i$ = Change in cash balance of firm i from the beginning until the end of 2011;

ΔCL_i = Change in current liabilities of firm i from the beginning until the end of 2011;

ΔLTD_i = Change in long-term debt included in current liabilities of firm i from the beginning until the end of 2011;

ΔITP_i = Change in income tax payable by firm i from the beginning until the end of 2011; and

DPA_i = Amount of depreciation and amortisation expense incurred by firm i during 2011.

Total accruals are then decomposed into non-discretionary (also commonly termed *normal*) accruals (herein NAC_i) and discretionary accruals (herein DAC_i) using the cross-sectional modified Jones (1991) model based on the work of Dechow et al. (1995). This process is defined as:

$$TAC_i/TA_i = \alpha_{i,t}(1/TA_{i,t-1}) + \beta_{i,t}(\Delta Rev/TA_{i,t-1}) - (\Delta AR_i/TA_{i,t-1}) + \gamma_{i,t}(PPE_i/TA_{i,t-1}) + \varepsilon_{i,t} \quad [2]$$

where:

TA_i = Total assets of firm i at the end of time period 2010;

ΔRev_i = Change in net sales of firm i between time period 2010 and time period 2011;

ΔAR_i = Change in accounts receivable of firm i from the beginning until the end of 2011;

PPE_i = Gross book value of the property, plant and equipment of firm i at the end of 2011;

$\alpha_i, \beta_i, \gamma_i$ = Estimated coefficients;

ε_i = Error term.

For all other definitions see Equation [1].

Non-discretionary accruals (NAC_i) are defined as the fitted (i.e., estimated) values from Equation [2] whilst DAC_i is the residual (i.e., the difference between TAC_i and NAC_i). Thus, DAC_i is represented as:

$$DAC_i = [TAC_i/TA_i] - [\alpha_i(1/TA_{i,t-1}) + \beta_i(\Delta Rev/TA_{i,t-1}) - (\Delta AR_i/TA_{i,t-1}) + \gamma_i(PPE_i/TA_{i,t-1})] \quad [3]$$

Discretionary accruals of Equation [3] represent the value of earnings management that is used as a dependent variable in Hypotheses H₄, H₅ and H₆ of this study.

4.5 Measurement of Independent Variables

In addition to using the existence of the internal audit function, and both the existence and extent of internal audit outsourcing as independent variables in Hypotheses H₄, H₅ and H₆, respectively, this study uses a number of corporate governance characteristics (audit committee effectiveness, board of director effectiveness and internal audit quality) as independent variables. The use of specific independent variables depends on the respective dependent variables and the related sample size. All the data on the independent variables except those related to internal audit quality were gathered from annual reports.

4.5.1 Effective audit committee characteristics

However, there is no consensus about what constitutes audit committee effectiveness. In this study, an effective audit committee is described as a committee comprising three characteristics, namely: the percentage of independent directors; employing at least one director possessing financial (including accounting and non-accounting) expertise; and having at least four meetings per annum. Prior research mentions that these three characteristics are the common attributes of an effective audit committee (Abbott and Parker 2000; Carcello and Neal 2000; Goodwin and Yeo 2001; Raghunandan, Read and Rama 2001; Carcello, Hermanson and Neal 2002; Bédard, Chtourou and Courteau 2004; Carcello, Hermanson and Raghunandan 2005b; Abbott et al. 2007; Barua, Rama and Sharma 2010). Effective audit committees are concerned about maintaining and enhancing their reputations and therefore take steps to demonstrate higher quality oversight that includes larger administrative budgets, frequent and longer meetings, etc. The association between an effective audit committee and internal audit is important in the corporate governance process (NACD 1999; SEC 1999, 2002, 2004). A higher quality audit committee is associated with greater internal audit involvement (Raghunandan, Read and Rama 2001; Carcello, Hermanson and Raghunandan 2005b). An effective audit committee also influences the decisions about how and in what form internal audit services are provided (Abbott et al. 2007). Data for all the audit committee characteristics were collected from the annual reports of companies in the sample.

To examine the association of an effective audit committee with internal audit, outsourcing and the extent of outsourcing, the current study includes the following characteristics of an effective audit committee as independent variables.

4.5.1.1 Audit committee independence (AC_{Indep})

‘Audit committee independence’ (*AC_{Indep}*) is a continuous independent variable used in the study. This variable is measured in terms of the ratio (percentage) of independent members to the total number of members on the audit committee. An audit committee is not independent if any member on the committee is a current or former employee of the firm or had any other disclosed relationship with the company or its management, other than board services (Abbott et al. 2007). Although the SOX requires all members on the audit committee to be independent, the ASX CGC (2007, Recommendations 2.1 and 4.2) requires an audit committee to have a majority of independent directors. An independent director is defined as a non-executive director who is not a member of management and who is free of any business or other relationship that could materially interfere with, or could reasonably be perceived to materially interfere with, the independent exercise of their judgment. Data for this variable were collected from the annual reports of companies in the sample. Consistent with the prior literature, the continuous variables of *AC_{Indep}* and *ACMeeting* were not transformed to confirm normality.

In this study, an independent audit committee is expected to be associated with internal audit, outsourcing and the extent of outsourcing. An independent audit committee looks for additional assurance from internal audit to ensure an effective monitoring and internal control process. The concern of the audit committee for its reputation and about the litigation risk demand greater levels of assurance thus causing companies to invest more in internal audit (Barua, Rama and Sharma 2010). An independent audit committee influences decisions affecting internal audit outsourcing, and the extent and types of activities outsourced (Abbott et al. 2007).

4.5.1.2 Audit committee expertise (ACExpert)

‘Audit committee expertise’ (*ACExpert*) is another audit committee characteristic used as an independent variable in this study. Expertise in this sense is considered as at least one member on the committee having related financial expertise (including accounting and non-accounting qualifications). In support of audit committee expertise, the ASX CGC (2007) has suggested that an audit committee should have members with financial literacy, relevant accounting qualifications and expertise, and industry knowledge. The independent variable, *ACExpert*, is a dichotomous (dummy) variable measured with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise. Data relating to audit committee expertise were collected from company annual reports.

The variable, *ACExpert*, is also used as a control variable to proxy for the corporate governance (CG) variable to examine its association with *DAC* in H₄, H₅, H₆ and H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f}. The variable, *ACExpert*, is an important corporate governance (CG) variable associated with better internal control processes leading to less earnings management (Zhang, Zhou and Zhou 2007; Hoitash and Hoitash 2009; Naiker and Sharma 2009). Bedard, Chtourou and Courteau (2004) found there was a negative association between the presence of at least one accounting and/or financial expert and aggressive earnings management.

4.5.1.3 Audit committee meetings (ACMeeting)

‘Audit committee meetings’ (*ACMeeting*) is another characteristic of audit committee effectiveness. The variable, *ACMeeting*, is a continuous independent variable measured in terms of the number of audit committee meetings held per annum and is a proxy for diligence. According to the ASX CGC (2007), an audit committee should meet often enough to effectively undertake its role. The American Bar Association’s Blue Ribbon Committee (1999) as well as the National Association of Corporate Directors (NACD 1999), the Treadway Commission (National Commission on Fraudulent Financial Reporting 1987), the Public Oversight Board (1993), etc., recommend that the audit committee should meet at least four times annually to properly evaluate current auditing issues and ensure effectiveness.

Frequent audit committee meetings ensure better communication between the committee members and the auditors (internal and external): they also indicate the committee's desire to perform its duties effectively (Kalbers and Fogarty 1993a; DeZoort et al. 2002). A positive association was found by Barua, Rama and Sharma (2010) between frequent audit committee meetings and investment in the internal audit budget. The current study includes *ACMeeting* in order to analyse its association with internal audit, the existence of outsourcing and the extent of internal audit outsourcing.

4.5.2 Board of directors' effectiveness

There are no common attributes to measure board of directors' effectiveness. In this study, an effective board of directors is described as a board consisting of three characteristics, namely, board independence, size and duality. Prior studies (Jensen 1993; Beasley 1996; Klein 2002a; Xie, Davidson and DaDalt 2003; Sharma 2004; Jackling and Johl 2009; Sun and Liu 2012; Nicholson and Kiel 2004) demonstrate that these common board characteristics ensure higher audit quality. The board of directors is responsible for ensuring the firm's internal control system and for checking whether the internal audit function is performed impartially (Badawi et al. 2003). Therefore, an effective board of directors will be involved in an internal audit function and outsourcing if the firm is not placed at greater risk in so doing. Data of all the board characteristics were collected from company annual reports from the sample. Consistent with the prior literature, the continuous variables of *BODIndep* and *BODSize* were not transformed to confirm normality.

To examine the association of an effective board of directors with the existence of internal audit and outsourcing, and the extent of outsourcing, the study includes the following characteristics of an effective board of directors as independent variables.

4.5.2.1 BOD independence (BODIndep)

This study uses 'BOD independence' (*BODIndep*) as a continuous independent variable. This variable, *BODIndep*, is measured in terms of the ratio (percentage) of

independent directors to the total number of directors on the board. The prior research (Beasley 1996; Klein 2002a; Xie, Davidson and DaDalt 2003) has similarly used the proportion of independent directors on the board to measure board independence. The current study expects that board independence is significantly associated with the existence of internal audit and outsourcing, and the extent of outsourcing.

Independent directors are not biased with respect to managers' actions, and bring diversified knowledge and experience to the firm (Firstenberg and Malkiel 1980; Cornett, McNutt and Tehranian 2009). Having a greater percentage of independent directors on boards effectively improves the oversight of management activities, increasing governance quality and firm performance (Rosenstein and Wyatt 1990; Byrd and Hickman 1992; Brickley, Coles and Terry 1994). The current study expects that board independence is associated with the existence of internal audit and outsourcing practices as an outcome of improving governance quality.

4.5.2.2 BOD size (*BODSize*)

'BOD size' (*BODSize*) is used as a continuous independent variable in the study. This characteristic of board effectiveness is measured in terms of the number of directors on the board. It is expected that board size is related to the existence of internal audit and outsourcing, and the extent of outsourcing.

The current study argues that board size influences board effectiveness. Earlier research (e.g., Jensen 1993; Beasley 1996; Beasley and Salterio 2001) reports that it is possible to have better control in the case of a smaller board. Moreover, while larger boards have access to diversified knowledge and experience, the possibility exists of more financial statement fraud thus increasing the need to ensure better monitoring and control. Therefore, this study expects that board size is associated with internal audit and outsourcing as mechanisms to ensure better internal control.

4.5.2.3 BOD duality (*BODDuality*)

‘BOD duality’ (*BODDuality*) is another independent variable situated under board characteristics. This variable is a dichotomous variable measured with a value of 1 if the chair of the board is not the Chief Executive Officer (CEO) or another senior executive; otherwise, it is 0. To be independent, the board chair should play a separate role to that of the CEO. Separation of these dual roles improves the board’s ability for better control and monitoring of activities (Cadbury Report 1992; ASX 2003; Standards Australia International 2003) and improves corporate governance quality. In the case of the separation of the board chair from the role of CEO, it is expected that this will be associated with the existence of internal audit and outsourcing, and the extent of outsourcing. Board duality also creates the problem of power concentration and conflict of interests that eventually result in lower governance quality (Davidson, Goodwin-Stewart and Kent 2005). Independent board chairs are more likely to provide for better oversight, including that associated with internal audit and outsourcing.

4.5.3 Internal audit quality

‘Internal audit quality’ (*IAQ*) is an important independent variable used in the study to examine its association with the existence and extent of internal audit outsourcing and earnings management. This is a complex notion in the sense that ‘quality’ (independent audit quality) has both an internal and external relevance. From an internal perspective, quality may be viewed as a function of size, resource allocation, experience, etc. and may include contributions provided in the outsourcing process. From an external perspective, internal audit quality is also a function of an effective corporate governance structure (particularly as it involves the audit committee, and to a lesser extent, the board). In addition, the relationship between internal audit and company management, and its effectiveness in this regard, are external relationships associated with quality that cannot be ignored.

The fact that internal audit is not mandatory for ASX-listed companies has resulted in approximately half of the companies in the sample not utilising this resource. Therefore, *IAQ* as an independent variable, is only testable for those ASX-listed firms that completed and

returned survey questionnaires and which have internal audit functions (in-house and/or outsourced). Little comparable information could be sourced from websites and/or annual reports for the financial year ended 2011. Consistent with the prior literature (Prawitt, Smith and Wood 2009), the five continuous variables of *IAQ* (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain* and *IAQTimeFin*) have not been transformed into logarithm (log) format or another format for normality issues. However, using the transformed variables and redoing the regression does not make any differences to the results in this study.

‘Internal audit quality’ (*IAQ*) is used as an independent variable to examine its relationship with internal audit outsourcing practices and earnings management. In line with Prawitt et al.’s (2009) work, the current study measures internal audit quality based on external auditing standards which define internal audit quality in terms of competence, the objectivity of internal auditors and the degree of its association with performing financial audits (AICPA 1991; PCAOB 2007). Based on this standard, internal audit quality is measured using six individual variables named *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*. Here, actual values from the questionnaire responses are taken into consideration to measure all of these variables, with the exception of *IAQObject* which is a dichotomous variable measured with a given value of 1 if the Chief Audit Executive reports to and has direct private access to the audit committee: otherwise, the value is 0.

Competence comprises three qualities of the internal audit function, namely, professional experience, certification and training (AICPA 1991). ‘Certification of internal auditors’ (*IAQCert*) is measured in terms of the percentage of internal auditors with a CIA, CPA or other relevant certification. ‘Internal audit experience’ (*IAQExperi*) is the internal auditors’ average number of years of internal auditing experience. ‘Internal audit size’ (*IAQSize*) measures the company’s investments in internal audit: it is computed by subtracting the average dollar amount spent on internal auditing for the industry, divided by the average total assets of the industry, from the dollar amount spent on internal auditing per company, divided by the company’s total assets. The result of this calculation is then divided by the

average dollar amount spent on internal auditing for the industry, divided by the average total assets of the industry.¹ ‘Internal audit training’ (*IAQTrain*) is the average number of hours of training completed by the internal auditor during the financial year ended 2011. According to SAS No. 65 and relevant IIA Standards, ‘internal auditor objectivity’ (*IAQObject*) indicates the reporting status of the internal auditor. It is a dummy variable that is given a value of 1 if the head of internal audit reports to and has direct private access to the audit committee; otherwise, it has a value of 0. To proxy for the degree of the internal audit function’s focus on performing financial audits, *IAQTimeFin* is measured as the percentage of internal audit time spent on performing financial audits.

The study expects that internal audit quality is associated with internal audit outsourcing, and the extent of outsourcing and earnings management.

4.6 Measurement of Control Variables

The study includes additional variables to control for the cross-sectional differences associated with firm size, firm risk, firm complexity, firm growth, audit firm quality and industry. Most of the variables are transformed to natural log, square root and cube root to provide better linear fit (normality) with the dependent variables. Data of all the control variables were collected from company annual reports of the sample. The definition and measurement of these control variables along with the justification for their use are presented below in Table 4.1.

¹ In formula form, this calculation is as follows:

$$\frac{(\text{Firm \$IAF}/\text{Firm \$TA}) - (\text{Ind. \$IAF}/\text{Ind. \$TA})}{(\text{Ind. \$IAF}/\text{Ind. \$TA})}$$

Table 4.1: Details of Control Variables

Definition	Variable	Measurement
Firm Size		
Market Capitalisation	<i>LogMarCap</i>	Natural logarithm (log) of the market value of equity.
Firm Risk		
Leverage	<i>SQRTLev</i>	Square root of the ratio of total long-term debt to total assets.
Firm Complexity		
Foreign Subsidiaries	<i>ForgnSubs</i>	Ratio of number of foreign subsidiaries to total number of subsidiaries.
Audit Firm Quality		
Auditor Specialist	<i>AuditorSpecialist</i>	Equal to the value of 1 if the external auditor is an industry specialist; otherwise, value is 0.
Industry		
Consumer Discretionary	<i>IndustryConDis</i>	A dummy variable is used to represent different industries where a value of 1 is assigned if the firm is within a specific industry; otherwise, the value is 0. The largest industry representation is used as the base group for comparison purposes.
Consumer Staples	<i>IndustryConStaples</i>	
Energy	<i>IndustryEnergy</i>	
Health Care	<i>IndustryHealthCare</i>	
Industrials	<i>IndustryIndustrials</i>	
Information Technology	<i>IndustryInfoTech</i>	
Materials	<i>IndustryMaterials</i>	
Telecommunications	<i>IndustryTeleCom</i>	
Utilities	<i>IndustryUtilities</i>	
		Given the low representation of some industries, these are accumulated into 'other' and the number of dummy variables limited as necessary.

4.6.1 Market capitalisation (LogMarCap)

'Firm size' is the most widely used control variable in earlier studies (Becker et al. 1998; Carcello, Hermanson and Raghunandan 2005b; Davidson, Goodwin-Stewart and Kent 2005; Goodwin-Stewart and Kent 2006; Abbott et al. 2007; Abbott, Parker and Peters 2010; Francis, Reichelt and Wang 2005). This study similarly uses firm size to control for its effect on the dependent variables with market capitalisation used as a proxy for firm size. 'Market capitalisation' is measured by the logarithm (log) of market capitalisation (the market value of issued shares). The natural logarithm (log) permits a comparison of firms with radically different equity values and is a continuous control variable.

Firm size is expected to be associated with the existence of internal audit and outsourcing, and the extent of outsourcing and earnings management. Earlier studies (Widener and Selto 1999; Carcello, Hermanson and Raghunandan 2005b; Sharma and Subramaniam 2005; Carey, Subramaniam and Ching 2006; Goodwin-Stewart and Kent 2006; Anderson et

al. 2012; Xie, Davidson and DaDalt 2003) found that firm size is positively related to investment in internal audit indicating that large firms are more likely to invest in internal auditing. Firm size is also associated with internal audit outsourcing. With the growth of internal audit activities, larger firms want to achieve economies of scale and are more likely to have in-house activities rather than outsourcing internal audit activities (Widener and Selto 1999; Carey, Subramaniam and Ching 2006). Furthermore, due to more complex operations, larger firms seek outsourcing to acquire expertise and knowledge and increase audit quality. Alternatively, smaller firms have resource constraints and may engage in less outsourcing (Carey, Subramaniam and Ching 2006). Moreover, during the preliminary years of establishing internal audit, smaller firms may engage in outsourcing to avoid the cost of establishing internal audit within the company. Therefore, it is assumed that there is an association of firm size with outsourcing without any direction of this relationship anticipated.

Larger firms are under strict scrutiny by financial analysts and investors which leads to less opportunity to manage earnings (Zhou and Elder 2002; Xie, Davidson and DaDalt 2003). In addition, larger firms are more likely to engage in income-decreasing earnings management to minimise strict political scrutiny and regulatory effects (Watts and Zimmerman 1990; Christie and Zimmerman 1994). On the other hand, smaller firms are not under strict scrutiny by regulatory bodies which allows them more opportunities to engage in earnings management (Sloan 1996; Koh 2003; Holland and Jackson 2004; Sánchez-Ballesta and García-Meca 2007). It is therefore predicted that there will be an association of firm size with the dependent variables.

4.6.2 Leverage (*SQRTLev*)

The study uses ‘leverage’ to control for firm risk in the analysis. Leverage is transformed into the square root of leverage (*SQRTLev*) to ensure normal distribution of the leverage data and calculated as the ratio of total debt (sum of long-term debt and current liabilities) to total assets. The variable, *SQRTLev*, is a continuous control variable.

Firms with high leverage tend to invest more in their internal audit budgets in order to ensure better monitoring, control and governance (Carcello, Hermanson and Raghunandan 2005). A highly leveraged firm is likely to increase earnings to meet debt covenant restrictions or to decrease earnings to show the firm's difficulties in seeking support for contractual renegotiations. Managing the accruals (either by increase or decrease) is therefore related to leverage. Earlier studies (Healy and Palepu 1990; DeFond and Jiambalvo 1994; Sweeney 1994; Dechow, Sloan and Sweeney 1996; Dechow and Skinner 2000; Beasley and Salterio 2001; Frankel, Johnson and Nelson 2002; Klein 2002a; Davidson, Goodwin-Stewart and Kent 2005; Press and Weintrop 1990; Charitou, Lambertides and Trigeorgis 2007) found positive or negative associations between leverage and earnings management. An association between earnings management and the level of leverage of firms without any direction of the relationship is anticipated in this study.

4.6.3 Foreign subsidiaries (*ForgnSubs*)

In line with earlier research ((Palmrose 1986; Simon 1995; Anderson et al. 2012), the current study includes 'foreign subsidiaries' (*ForgnSubs*) to control for the effect of firm complexity on the need for internal audit, outsourcing and earnings management. This is a continuous control variable measured as the ratio of foreign subsidiaries to total subsidiaries. Earlier studies (Carcello, Hermanson and Raghunandan 2005; Goodwin-Stewart and Kent 2006a; Anderson et al. 2012) reported that firms with more foreign subsidiaries have a complex and expansive business operation which necessitates appropriate delegation of authority. Therefore, there is a need for the internal audit function to manage these risks. Consistent with earlier studies, this study expects that firms with more complex operations are more likely to ensure the existence of an internal audit function (either in-house or outsourced) which helps to ensure better governance process.

4.6.4 Auditor specialist (*AuditorSpecialist*)

The quality of external audit services has a major influence on internal governance mechanisms within firms. Audit firms most often specialise in the provision of services within particular industry sectors: in this study, ‘audit firm quality’ is included as a feasible control variable used to test for earnings management as well as for the employment of specialists and it influences decisions to engage internal audit functions, including outsourcing. Industry specialist auditors possess industry-specific knowledge and expertise which contributes to higher quality audit services compared to those provided by non-specialist auditors (Dunn and Mayhew 2004). Earlier studies (Balsam, Krishnan and Yang 2003; Prawitt, Smith and Wood 2009; Lin and Hwang 2010; Sun and Liu 2012; Krishnan 2003b) indicated that industry specialist auditors have a better knowledge of the industry and associated accounting requirements and are more likely to detect discretionary earnings, effectively deterring earnings management practices and thus leading to better internal governance quality.

In the context of this study, attention is given to Krishnan’s (2003a) recommendations that the use of major accounting firms should be used as the basis for estimating audit quality (viz., currently the Big Four). In Australia, these firms collectively provide the majority of services to the top 500 ASX-listed firms. Firm sales, a significant correlate of audit fees, is used as the basis for determining those audit firms that specialise within particular industry sectors. In this context, an industry specialist is defined as an audit firm that contains within-industry market shares (i.e., audit firm sales/industry sales) of 15% or more. For the purpose of analysis in this study, *AuditorSpecialist* is a dichotomous control variable which scores a value of 1 if the external auditor is an industry specialist; otherwise, the value is 0. Krishnan (2003a) found that proxies of this nature are useful in establishing a significant negative relationship between audit specialist usage and a firm’s use of discretionary accruals.

4.6.5 Industry

Finally, the study includes ‘industry’ to control for the effect of different industries on the level of discretionary accruals. Consistent with earlier research (for example, Davidson, Goodwin-Stewart and Kent 2005; Prawitt, Smith and Wood 2009; Rusmin 2010; Anderson et al. 2012), this study uses industry to control the potential effect of industry differences on internal audit and earnings management. Due to limited numbers in the sample, ‘industry’ is not used in association with outsourcing as a control variable. *Industry* is recorded as an adjusted dummy variable and is used to represent different industries: it is given a value of 1 if the firm is within a specific industry, compared to a given base industry. The materials industry has the largest sub-sample and is considered as the base industry and is scored as 0. All other industries are then compared with the materials industry to justify the effect on the existence of the internal audit function and earnings management (Hair et al. 2010).

4.7 Statistical Tests and Model Specification

This study uses multiple regression models to test its hypotheses. Depending on the nature of the dependent variables, cross-sectional multiple regression models are used. The study assumes that corporate governance characteristics (audit committee effectiveness, board of director effectiveness) are associated with internal audit and outsourcing. Furthermore, internal audit quality is assumed to influence the decision to undertake internal audit outsourcing as well as about the extent of outsourcing. Therefore, logistic and ordinary least squares (OLS) regression analyses are used in the first two analyses and the third analysis, respectively. To test the association between earnings management and different internal governance characteristics, OLS regression analysis is used.

4.7.1 Regression analysis to test the association of AC effectiveness with existence of internal audit function

The statistical model used to test the association of audit committee (AC) effectiveness with the existence of the internal audit function (IAF) is as follows:

$$IAF_i = \beta_0 + \beta_1 ACIndep_i + \beta_2 ACExpert_i + \beta_3 ACMeeting_i + \beta_4 LogMarCap_i + \beta_5 ForgnSubs_i + \beta_6 AuditorSpecialist_i + \beta_7 IndustryConDis_i + \beta_8 IndustryConStaples_i + \beta_9 IndustryEnergy_i + \beta_{10} IndustryHealthCare_i + \beta_{11} IndustryIndustrials_i + \beta_{12} IndustryInfoTech_i + \beta_{13} IndustryMaterials_i + \beta_{14} IndustryTeleCom_i + \beta_{15} IndustryUtilities_i + \varepsilon_i \quad [4]$$

where:

IAF_i = Existence of internal audit function of firm i ;

$ACIndep_i$ = Percentage of independent members on audit committee of firm i ;

$ACExpert_i$ = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

$ACMeeting_i$ = Number of times audit committee members of firm I meet annually;

$LogMarCap_i$ = Logarithm of market capitalisation of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if the external auditor is an industry specialist; otherwise, value is 0;

$IndustryConDis_i$ = A dummy variable of firm i with a value of 1 if firm is within the consumer discretionary industry; otherwise, value is 0;

$IndustryConStaples_i$ = A dummy variable of firm i with a value of 1 if firm is within the consumer staples industry; otherwise, value is 0;

$IndustryEnergy_i$ = A dummy variable of firm i with a value of 1 if firm is within the energy industry; otherwise, value is 0;

$IndustryHealthCare_i$ = A dummy variable of firm i with a value of 1 if firm is within the health care industry; otherwise, value is 0;

$IndustryIndustrials_i$ = A dummy variable of firm i with a value of 1 if firm is within the industrials industry; otherwise, value is 0;

$IndustryInfoTech_i$ = A dummy variable of firm i with a value of 1 if firm is within the information technology industry; otherwise, value is 0;

$IndustryMaterials_i$ = A dummy variable of firm i with a value of 1 if firm is within the materials industry; otherwise, value is 0;

$IndustryTeleCom_i$ = A dummy variable of firm i with a value of 1 if firm is within the telecommunications industry; otherwise, value is 0;

$IndustryUtilities_i$ = A dummy variable of firm i with a value of 1 if firm is within the utilities industry; otherwise, value is 0;

β = Coefficients of variables 0 through to 15;

ε_i = Error term.

The logistic regression analysis in Equation [4] is presented to examine the cross-sectional association of the characteristics of audit committee (AC) effectiveness, particularly audit committee (AC) independence, expertise and the number of meetings per annum, with the existence of internal audit, referring to the discussion of hypotheses in Chapter Three, subsection 3.3.1.1.

4.7.2 Regression analysis to test the association of BOD effectiveness with existence of internal audit function

The statistical model used to test the association of board of directors' (BOD) effectiveness with the existence of the internal audit function is as follows:

$$IAF_i = \beta_0 + \beta_1 BODIndep_i + \beta_2 BODSize_i + \beta_3 BODDuali_i + \beta_4 LogMarCap_i + \beta_5 ForgnSubs_i + \beta_6 AuditorSpecialist_i + \beta_7 IndustryConDis_i + \beta_8 IndustryConStaples_i + \beta_9 IndustryEnergy_i + \beta_{10} IndustryHealthCare_i + \beta_{11} IndustryIndustrials_i + \beta_{12} IndustryInfoTech_i + \beta_{13} IndustryMaterials_i + \beta_{14} IndustryTeleCom_i + \beta_{15} IndustryUtilities_i + \varepsilon_i \quad [5]$$

where:

IAF_i = Existence of internal audit function of firm i ;

$BODIndep_i$ = Percentage of independent directors on board of firm i ;

$BODSize_i$ = Number of directors on board of firm i ;

$BODDuali_i$ = Firm i with a value of 1 if BOD chair is an independent member; otherwise, value is 0;

$LogMarCap_i$ = Logarithm of market capitalisation of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

$IndustryConDis_i$ = A dummy variable of firm i with a value of 1 if firm is within the consumer discretionary industry; otherwise, value is 0;

$IndustryConStaples_i$ = A dummy variable of firm i with a value of 1 if firm is within the consumer staples industry; otherwise, value is 0;

$IndustryEnergy_i$ = A dummy variable of firm i with a value of 1 if firm is within the energy industry; otherwise, value is 0;

$IndustryHealthCare_i$ = A dummy variable of firm i with a value of 1 if firm is within the health care industry; otherwise, value is 0;

$IndustryIndustrials_i$ = A dummy variable of firm i with a value of 1 if firm is within the industrials industry; otherwise, value is 0;

$IndustryInfoTech_i$ = A dummy variable of firm i with a value of 1 if firm is within the information technology industry; otherwise, value is 0;

$IndustryMaterials_i$ = A dummy variable of firm i with a value of 1 if firm is within the materials industry; otherwise, value is 0;

$IndustryTeleCom_i$ = A dummy variable of firm i with a value of 1 if firm is within the telecommunications industry; otherwise, value is 0;

$IndustryUtilities_i$ = A dummy variable of firm i with a value of 1 if firm is within the utilities industry; otherwise, value is 0;

β = Coefficients of variables 0 through to 15;

ε_i = Error term.

The logistic regression analysis in Equation [5] is presented to examine the cross-sectional association of the characteristics of board of directors' (BOD) effectiveness, specifically the board of directors' (BOD) independence, size and duality, with the existence of the internal audit function, referring to the discussion of hypotheses in Chapter Three, subsection 3.3.1.2.

4.7.3 Regression analysis to test the association of AC effectiveness with existence of internal audit outsourcing

The statistical model used to test the association of audit committee (AC) effectiveness with the existence of internal audit outsourcing is as follows:

$$IAO_i = \beta_0 + \beta_1 ACIndep_i + \beta_2 ACExpert_i + \beta_3 ACMeeting_i + \beta_4 IAQCert_i + \beta_5 IAQExperi_i + \beta_6 IAQSize_i + \beta_7 IAQTrain_i + \beta_8 IAQObject_i + \beta_9 IAQTimeFin_i + \beta_{10} LogMarCap_i + \beta_{11} ForgnSubsi + \beta_{12} AuditorSpecialist_i + \varepsilon_i \quad [6]$$

where:

IAO_i = Existence of internal audit outsourcing of firm i ;

$ACIndep_i$ = Percentage of independent members on audit committee of firm i ;

$ACExpert_i$ = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

$ACMeeting_i$ = Number of times audit committee members of firm i meet annually;

$IAQCert_i$ = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

$IAQExperi_i$ = Average number of years of internal auditing experience of internal auditors of firm i ;

$IAQSize_i$ = Investments in internal audit function of firm i ;

$IAQTrain_i$ = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

$IAQObject_i$ = A dummy variable given a value of 1 if head of internal audit of firm i reports to audit committee; otherwise, value is 0;

$IAQTimeFin_i$ = Percentage of internal audit time spent on performing financial audits of firm i ;

LogMarCap_i = Logarithm of market capitalisation of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The logistic regression model in Equation [6] is presented to examine the cross-sectional association of the characteristics of audit committee (AC) effectiveness, specifically, audit committee (AC) independence, expertise and the number of meetings per annum, with the existence of internal audit outsourcing, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.2.1 and 3.3.2.3.

4.7.4 Regression analysis to test the association of BOD effectiveness with existence of internal audit outsourcing

The statistical model used to test the association of board of directors' (BOD) effectiveness with the existence of internal audit outsourcing is as follows:

$$IAO_i = \beta_0 + \beta_1 BODIndep_i + \beta_2 BODSize_i + \beta_3 BODDuality_i + \beta_4 IAQCert_i + \beta_5 IAQExperi_i + \beta_6 IAQSize_i + \beta_7 IAQTrain_i + \beta_8 IAQObject_i + \beta_9 IAQTimeFin_i + \beta_{10} \text{LogMarCap}_i + \beta_{11} ForgnSubs_i + \beta_{12} AuditorSpecialist_i + \varepsilon_i \quad [7]$$

where:

IAO_i = Existence of internal audit outsourcing of firm i ;

$BODIndep_i$ = Percentage of independent directors on board of firm i ;

$BODSize_i$ = Number of directors on board of firm i ;

$BODDuality_i$ = Firm i with a value of 1 if BOD chair is an independent member; otherwise, value is 0;

$IAQCerti_i$ = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

$IAQExperi_i$ = Average number of years of internal auditing experience of internal auditors of firm i ;

$IAQSize_i$ = Investments in internal audit function of firm i ;

$IAQTrain_i$ = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

$IAQObject_i$ = A dummy variable given a value of 1 if head of internal audit of firm i reports to audit committee; otherwise, value is 0;

$IAQTimeFin_i$ = Percentage of internal audit time spent on performing financial audits of firm i ;

LogMarCap_i = Logarithm of market capitalisation of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The logistic regression model in Equation [7] is presented to examine the cross-sectional association of the characteristics of board of directors' effectiveness, specifically board independence, size and duality with the existence of internal audit outsourcing, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.2.2 and 3.3.2.3.

4.7.5 Regression analysis to test the association of AC effectiveness with extent of internal audit outsourcing

The statistical model used to test the association of audit committee (AC) effectiveness with the extent of internal audit outsourcing is shown in Equation [8]. It differs from regression Equations [5] and [6], in that it is concerned with determining the incremental influence of various factors on the extent to which firms with an internal audit function outsource that function. This can vary from 0% for firms that have an internal audit function but do not outsource through to 100% where all audit activities are outsourced:

$$\text{ExtentIAO}_i = \beta_0 + \beta_1\text{ACIndep}_i + \beta_2\text{ACEExpert}_i + \beta_3\text{ACMeeting}_i + \beta_4\text{IAQCert}_i + \beta_5\text{IAQExperi}_i + \beta_6\text{IAQSize}_i + \beta_7\text{IAQTrain}_i + \beta_8\text{IAQObject}_i + \beta_9\text{IAQTimeFin}_i + \beta_{10}\text{LogMarCap}_i + \beta_{11}\text{ForgnSubs}_i + \beta_{12}\text{AuditorSpecialist}_i + \varepsilon_i \quad [8]$$

where:

ExtentIAO_i = Extent of internal audit outsourcing of firm i ;

ACIndep_i = Percentage of independent members on audit committee of firm i ;

ACEExpert_i = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

ACMeeting_i = Number of times audit committee members of firm i meet annually;

IAQCert_i = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

IAQExperi_i = Average number of years of internal auditing experience of internal auditors of firm i ;

IAQSize_i = Investments in internal audit function of firm i ;

IAQTrain_i = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

IAQObject_i = A dummy variable given a value of 1 if head of internal audit of firm i reports to audit committee; otherwise, value is 0;

IAQTimeFin_i = Percentage of internal audit time spent on performing financial audits of firm i ;

LogMarCap_i = Logarithm of market capitalisation of firm i ;

ForgnSubs_i = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The OLS regression model in Equation [8] is presented to examine the cross-sectional association of the characteristics of audit committee (AC) effectiveness, specifically audit committee independence (AC), expertise and the number of meetings per annum with the extent of internal audit outsourcing, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.3.1 and 3.3.3.3.

4.7.6 Regression analysis to test the association of BOD effectiveness with extent of internal audit outsourcing

The statistical model used to test the association of board of directors' (BOD) effectiveness with the extent of internal audit outsourcing is shown in Equation [9]. It also differs from regression Equations [7] and [8], in that it is concerned with determining the incremental influence of various factors on the extent to which firms with an internal audit function outsource that function. This can vary from 0% for firms that have an internal audit function but do not outsource through to 100% where all audit activities are outsourced:

$$ExtentIAO_i = \beta_0 + \beta_1 BODIndep_i + \beta_2 BODSize_i + \beta_3 BODDual_i + \beta_4 IAQCert_i + \beta_5 IAQExperi_i + \beta_6 IAQSize_i + \beta_7 IAQTrain_i + \beta_8 IAQObject_i + \beta_9 IAQTimeFin_i + \beta_{10} LogMarCap_i + \beta_{11} ForgnSubs_i + \beta_{12} AuditorSpecialist_i + \varepsilon_i \quad [9]$$

where:

$ExtentIAO_i$ = Extent of internal audit outsourcing of firm i ;

$BODIndep_i$ = Percentage of independent directors on board of firm i ;

$BODSize_i$ = Number of directors on board of firm i ;

$BODDual_i$ = Firm i with a value of 1 if BOD chair is an independent member; otherwise, value is 0;

$IAQCert_i$ = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

$IAQExperi_i$ = Average number of years of internal auditing experience of internal auditors of firm i ;

$IAQSize_i$ = Investments in internal audit function of firm i ;

$IAQTrain_i$ = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

$IAQObject_i$ = A dummy variable given a value of 1 if head of internal audit of firm i reports to audit committee; otherwise, value is 0;

$IAQTimeFin_i$ = Percentage of internal audit time spent on performing financial audits of firm i ;

LogMarCap_i = Logarithm of market capitalisation of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The OLS regression model in Equation [9] is presented to examine the cross-sectional association of the characteristics of board of directors' (BOD) effectiveness, specifically board independence, size and duality, with the extent of internal audit outsourcing, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.3.2 and 3.3.3.3.

4.7.7 Regression analysis to test the association of existence of internal audit function with earnings management

The statistical model used to test the association of the existence of internal audit function with earnings management is as follows:

$$DAC_i = \beta_0 + \beta_1 IAF_i + \beta_2 ACEExpert_i + \beta_3 \text{LogMarCap}_i + \beta_4 \text{SQRTLev}_i + \beta_5 ForgnSubs_i + \beta_6 AuditorSpecialist_i + \beta_7 IndustryConDis_i + \beta_8 IndustryConStaples_i + \beta_9 IndustryEnergy_i + \beta_{10} IndustryHealthCare_i + \beta_{11} IndustryIndustrials_i + \beta_{12} IndustryInfoTech_i + \beta_{13} IndustryMaterials_i + \beta_{14} IndustryTeleCom_i + \beta_{15} IndustryUtilities_i + \varepsilon_i \quad [10]$$

where:

DAC_i = Discretionary accruals of firm i ;

IAF_i = Existence of internal audit function of firm i ;

$ACEExpert_i$ = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

LogMarCap_i = Logarithm of market capitalisation of firm i ;

SQRTLev_i = Square root of leverage of firm i ;

ForgnSubs_i = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$\text{AuditorSpecialist}_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

IndustryConDis_i = A dummy variable of firm i with a value of 1 if firm is within the consumer discretionary industry; otherwise, value is 0;

$\text{IndustryConStaples}_i$ = A dummy variable of firm i with a value of 1 if firm is within the consumer staples industry; otherwise, value is 0;

IndustryEnergy_i = A dummy variable of firm i with a value of 1 if firm is within the energy industry; otherwise, value is 0;

$\text{IndustryHealthCare}_i$ = A dummy variable of firm i with a value of 1 if firm is within the health care industry; otherwise, value is 0;

$\text{IndustryIndustrials}_i$ = A dummy variable of firm i with a value of 1 if firm is within the industrials industry; otherwise, value is 0;

$\text{IndustryInfoTech}_i$ = A dummy variable of firm i with a value of 1 if firm is within the information technology industry; otherwise, value is 0;

$\text{IndustryMaterials}_i$ = A dummy variable of firm i with a value of 1 if firm is within the materials industry; otherwise, value is 0;

IndustryTeleCom_i = A dummy variable of firm i with a value of 1 if firm is within the telecommunications industry; otherwise, value is 0;

$\text{IndustryUtilities}_i$ = A dummy variable of firm i with a value of 1 if firm is within the utilities industry; otherwise, value is 0;

β = Coefficients of variables 0 through to 15;

ε_i = Error term.

The OLS regression model in Equation [10] is presented to examine the cross-sectional association of the existence of internal audit function with discretionary accruals which is used as a proxy to measure earnings management, referring to the discussion of hypotheses in Chapter Three, subsection 3.3.4.

4.7.8 Regression analysis to test the association of existence of internal audit outsourcing with earnings management

The statistical model used to test the association of the existence of internal audit outsourcing with earnings management is as follows:

$$DAC_i = \beta_0 + \beta_1 IAO_i + \beta_2 IAQCerti + \beta_3 IAQExperi_i + \beta_4 IAQSize_i + \beta_5 IAQTrain_i + \beta_6 IAQObject_i + \beta_7 IAQTimeFin_i + \beta_8 ACEExpert_i + \beta_9 LogMarCap_i + \beta_{10} SQRTLev_i + \beta_{11} ForgnSubs_i + \beta_{12} AuditorSpecialist_i + \varepsilon_i \quad [11]$$

where:

DAC_i = Discretionary accruals of firm i ;

IAO_i = Existence of internal audit outsourcing of firm i ;

$IAQCerti$ = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

$IAQExperi_i$ = Average number of years of internal auditing experience of internal auditors of firm i ;

$IAQSize_i$ = Investments in internal audit function of firm i ;

$IAQTrain_i$ = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

$IAQObject_i$ = A dummy variable given a value of 1 if head of internal audit of firm i reports to the audit committee; otherwise, value is 0;

$IAQTimeFin_i$ = Percentage of internal audit time spent on performing financial audits of firm i ;

$ACEExpert_i$ = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

$LogMarCap_i$ = Logarithm of market capitalisation of firm i ;

$SQRTLev_i$ = Square root of leverage of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The OLS regression model in Equation [11] is presented to examine the cross-sectional association of the existence of internal audit outsourcing with discretionary accruals, a proxy for earnings management, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.5 and 3.3.7.

4.7.9 Regression analysis to test the association of extent of internal audit outsourcing with earnings management

The statistical model used to test the association of the extent of internal audit outsourcing with earnings management is as follows:

$$DAC_i = \beta_0 + \beta_1 ExtentIAO_i + \beta_2 IAO_i + \beta_3 IAQCerti + \beta_4 IAQExperi_i + \beta_5 IAQTrain_i + \beta_6 IAQObject_i + \beta_7 IAQTimeFin_i + \beta_8 ACEExpert_i + \beta_9 LogMarCap_i + \beta_{10} SQRTLev_i + \beta_{11} ForgnSubs_i + \beta_{12} AuditorSpecialist_i + \varepsilon_i \quad [12]$$

where:

DAC_i = Discretionary accruals of firm i ;

$ExtentIAO_i$ = Extent of internal audit outsourcing of firm i ;

$IAQCerti$ = Percentage of internal auditors of firm i with CIA, CPA or relevant certification;

$IAQExperi_i$ = Average number of years of internal auditing experience of internal auditors of firm i ;

$IAQSize_i$ = Investments in internal audit function of firm i ;

$IAQTrain_i$ = Average number of hours of training completed by internal auditor of firm i during financial year ended 2011;

$IAQObject_i$ = A dummy variable given a value of 1 if head of internal audit of firm i reports to audit committee; otherwise, value is 0;

$IAQTimeFin_i$ = Percentage of internal audit time spent on performing financial audits of firm i ;

$ACEExpert_i$ = Firm i with a value of 1 if at least one audit committee member has relevant financial (accounting and non-accounting) expertise; otherwise, value is 0;

$LogMarCap_i$ = Logarithm of market capitalisation of firm i ;

$SQRTLev_i$ = Square root of leverage of firm i ;

$ForgnSubs_i$ = Number of foreign subsidiaries divided by total number of subsidiaries of firm i ;

$AuditorSpecialist_i$ = Firm i with a value of 1 if external auditor is an industry specialist; otherwise, value is 0;

β = Coefficients of variables 0 through to 12;

ε_i = Error term.

The OLS regression analysis in Equation [12] is presented to examine the cross-sectional association of the extent of internal audit function with discretionary accruals, referring to the discussion of hypotheses in Chapter Three, subsections 3.3.6 and 3.3.7.

4.8 Sensitivity Analysis

Several sensitivity tests were performed to determine the sensitivity and robustness of the main findings of this study. Different measures of audit committee (AC) effectiveness were recalculated based on alternative measures of audit committee (AC) independence and number of meetings per annum. For example, instead of using the measure of the percentage of independent members on the audit committee, a dummy variable was used with a value of 1 if the audit committee (AC) was entirely comprised of independent members; otherwise, the value was 0. Different measures were also performed with the number of meetings per annum, *ACMeeting*. Instead of considering the continuous values of the number of audit committee (AC) meetings as well as the number of members on the audit committee, the study performed the related regression with a dummy value of 1 if the audit committee (AC) met at least four times per annum; otherwise, the value was 0. Different measures of board effectiveness were also recalculated based on alternative measures of board independence and size. For example, instead of using the percentage of independent directors on the board, a dummy variable was used with a value of 1 if the board was entirely comprised of independent directors; otherwise, the value was 0. Different measures were also performed with *BODMeeting*. Rather than considering the continuous value of the number of board meetings, the study performed the regression with a dummy variable with a value of 1 if the board met from five to nine times per annum; otherwise, the value was 0. Furthermore, composite scores of internal audit quality (IAQ) were used to measure the association of internal audit quality (IAQ) with outsourcing

and earnings management. Instead of using six individual measures of internal audit quality (IAQ), single composite scores of internal audit quality (IAQ) were performed to examine the results of Hypotheses H_{2a1}, H_{2a2}, H_{2a3} and H_{2b1}; H_{2b2} and H_{2b3}; H_{3a1}, H_{3a2}, H_{3a3} and H_{3b1}; H_{3b2} and H_{3b3}; and H₅ and H₆ in Equations [6], [7], [8], [9], [11] and [12], respectively.

Discretionary accruals were recalculated using a different model (i.e., the performance-matched modified Jones model [PMMJM]) of earnings management. This helped to validate the findings of the regression models in Equations [10], [11] and [12] in examining the association of internal governance with discretionary accruals.

With respect to control variables, this study recalculated control variables using different measures of firm size, risk and complexity, and auditor firm quality, etc.

Additional tests were performed by partitioning the firms from the sample in respect to firm size, risk, complexity, auditor specialist and industry. This partitioning helped to test the stability of the main results and would present whether the main result was influenced by any specific categorisation of firm characteristics (e.g., larger or smaller firm size, high or low risk firm, more or less complex firm, with or without auditor specialist). Moreover, industry partitioning would help to show whether the major industry group (e.g., materials, industrials, consumer discretionary) or other industry groups had any influence on the main results. This study could not perform the regression to examine the differences between firms with or without an internal audit function (IAF) due to constant values of the internal audit function (IAF) (either 0 or 1).

4.9 Summary of the Chapter

Chapter Four provided detailed information relating to the research methodology used to test the hypotheses discussed in Chapter Three. First, the information on sample selection and time period selection was presented followed by source documentation. This section then discussed both primary and secondary data collection stages. Next, the measurement and justification for using all the dependent, independent and control variables of the study was

discussed. Subsequent sections of the chapter presented information on the statistical method and sensitivity analyses used in the study.

Chapter Five provides descriptive statistics of all variables used in the various regression analyses, as described in Chapter Four, for the financial year ended 2011. At the beginning of the chapter, detailed information is presented on the sample selection process, the industry breakdown and the status of responses from the questionnaire survey and annual reports. This is followed by descriptive statistics of all the variables (both continuous and dichotomous) representing the two sample sizes of 240 and 60. Pearson's correlation coefficients are then provided for the variables: this is followed by descriptive information about internal audit outsourcing and a summary of the chapter.

Chapter Five: Descriptive Statistics

5.1 Overview of the Chapter

Chapter Four discussed the research methodology used in this study to test the hypotheses. The chapter started with a description of the sample and time period selection and presented information about the collection of data from both primary and secondary sources. Each variable used in this study and the way in which it was measured was described along with the rationale for using particular variables. Finally, the statistical method and sensitivity tests used in this study were discussed followed by the summary of the chapter.

Chapter Five provides descriptive statistics for the financial year ended 2011 of all the variables associated with this study and which relate to the hypotheses derived earlier in Chapter Three. First, a detailed description of the sample selection process is presented: this includes an industry breakdown of responses compared to the population of the top 500 ASX-listed firms. The subsequent sections provide descriptive statistics of the variables used in the study. Descriptive information is presented for all continuous and dichotomous variables relating to relevant samples in separate tables (viz., sample sizes 240 and 60, respectively). Sample sizes were determined by the data collection strategy adopted and necessarily limited the nature and depth of subsequent analyses. This chapter also provides Pearson's correlation coefficients of the variables used in the different regression models. The descriptive statistics of internal audit outsourcing information obtained from the questionnaire survey are also included at the end of the chapter.

5.2 Sample Selection Process and Industry Breakdown

This section provides a detailed description of the sample selection process and the breakdown of industries. Table 5.1, Panel A outlines the final sample selection process. The study considered the top 500 ASX-listed companies as the sampling unit from a population of 1,546 companies after deducting financial institutions, foreign incorporated companies, and companies that were delisted as well as those with missing data. The first and second phases of the questionnaire survey were conducted on the top 500 ASX-listed companies. Postal

questionnaire responses were received from only 111 firms providing a response rate of 22.2%. From the remaining 389 (500 minus 111) non-response companies, one-third were randomly selected for secondary data collection which involved an examination of financial reports. This examination indicated that 129 companies either reported the existence of an internal audit function (IAF) (in-house or outsourced) or appeared not to employ the function. These two forms of data collection resulted in a usable sample of 240 companies for the financial year ended 2011.

In the process of ranking the companies (in order of their market capitalisation) to select the top 500, the study considered 1,546 ASX-listed companies for the financial year ended 2011. Table 5.1, Panel B shows all the common exclusions from the list of all (approximately 2,040) ASX-listed companies that were reduced by this process to 1,546 companies. All the exclusions followed the recommendations of prior literature (Clifford and Evans 1997; Abbott and Parker 2000; Klein 2002a; Bradbury, Mak and Tan 2006; Abbott, Parker and Peters 2010). For example, financial institutions and foreign incorporated firms were excluded from the population base. All financial institutions (281 in total) (e.g., banks, trusts, insurance companies, stock brokerage firms) were excluded due to the unique aspects of the regulatory environments and regulations imposed on them by legislative bodies. Foreign incorporated firms were excluded as they do not always follow the same financial statements' disclosure requirements as are required of the majority of ASX-listed companies. Therefore, 58 foreign incorporated firms were excluded from the total population. In order to avoid the influence of unexpected changes in share price, a further 124 companies that were not continuously listed on the ASX were also excluded. Finally, 31 companies with missing data during the year 2011 were excluded which resulted in 1,546 companies from which the top 500 (ranked based on their market capitalisation) were considered the sampling unit for the study.

The Australian Government's *Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004* (CLERP 9) (Commonwealth of Australia 2004)

proposed a mandatory audit committee for the top 500 ASX-listed companies. Similarly, the ASX amended its Listing Rules in 2003 to have firms establish an audit committee if they were included in Standard and Poor (S&P)'s 500/ASX All Ordinaries Index (Davidson, Goodwin-Stewart and Kent 2005). The ASX Corporate Governance Council (CGC) (2003) also states in Recommendation 7.1 that all companies should have an audit committee to oversee the management of risk. The ASX CGC commentary makes the inference that the effectiveness of risk management and internal controls are generally determined by an internal audit function (IAF) and that large firms ought to consider their use in this connection. The ASX CGC's (2010) Recommendation 7.2 is followed by a commentary that suggests that the internal audit function (IAF) would provide the necessary assurance of compliance and would carry out an independent appraisal of the adequacy and effectiveness of the company's risk management and internal controls. It states: “[a] company should consider having an internal audit” (p. 33).

The importance of the IAF is further emphasised in the latest 2014 (3rd) edition of the ASX CGC guidelines and recommendations for listed companies, specifically in a new Recommendation 7.3 where it is stated that listed companies should disclose the existence of an IAF along with the structures and roles of the function. The ASX-listed companies also need to disclose how they ensure effective risk management and internal control processes if they do not have an internal audit function (IAF). The new recommendations relating to internal audit will emphasise the significance of internal audit in corporate governance in the Australian market to a greater extent as a consequence of these changes. Furthermore, the top 500 ASX-listed companies represent approximately 98% of the Australian equity market capitalisation which demonstrates their significance and justifies the data selection process used in this study. Consistent with prior empirical studies (Carey, Subramaniam and Ching 2006; Barua, Rama and Sharma 2010; Anderson et al. 2012) which reported that after considering resource availability, large companies are more likely to engage internal audit services. The study therefore assumes that the top 500 ASX-listed companies would most

likely employ a separate audit committee that would influence the decision to engage an internal audit function (IAF).

Table 5.1, Panel C presents the industry breakdown of the total population and usable sample units of 500 and 240 selected companies, respectively. The industry breakdown of the 240 companies in the sample shows that the materials (36.7%) sector was represented most, followed by the industrials (15.8%) and consumer discretionary (15.0%) sectors. Collectively, the materials and industrials (52.5%) sectors represented the highest proportion of firms in the final sample. On the other hand, telecommunications (0.8%), utilities (3.3%) and consumer staples (3.3%) were the least represented sectors in the usable sample and thus were included under a miscellaneous industry heading combining these three sectors (total 7.4%). A similar trend was observed in the industry breakdown of the top 500 firms where the materials (34.0%) sector was the major industry sector represented. Following materials, industrials (17.6%) and energy (14.6%) were the next most represented industry sectors in the top 500 ASX-listed companies. On the other hand, telecommunications (2.0%), consumer staples (3.4%) and utilities (3.6%) were the least represented (total 9%) sectors, and were included within the ‘miscellaneous’ category. The total sample of examinable firms (viz. 240) represented almost one-half of the sampling unit. A cross-tabulation of sample versus total industry representation was conducted and sector differences were not significant (Pearson’s X^2 asymptotic significance is 0.289).

Table 5.2 presents a breakdown of the 240 responses from primary and secondary sources. Of the total population of 500 companies selected for the questionnaire survey, the total responses (111) represented a response rate of 22.2%. More than half (60) or 54.06% of these companies employed internal audit functions (IAFs). The remaining 51 companies reported no internal audit function (IAF) and left the questionnaire uncompleted. Referring to Chapter Four, Section 4.3 on the data collection process, the secondary source of information from annual reports was used to supplement the primary source data. For the financial period ending 31 December 2011, it was not mandatory to mention internal audit status in annual

reports; however, numerous companies disclosed internal audit information, particularly regarding the role of internal audit and outsourcing. One-third of the non-responding firms were selected randomly and their financial reports were examined, resulting in an additional 129 positive outcomes. From the total (129) responses, more than half (59.69%) of the companies reported the use of an internal audit function (IAF). Very few companies reported the additional information that was solicited in the original questionnaire; however, it was ascertained that 57.1% of the 240 companies in the sample reported the existence of an internal audit function (IAF) (refer to Table 5.2). Carey, Subramaniam and Ching (2006) examined all ASX-listed companies for the financial year ended 1998 and estimated that one in three companies engaged in internal audit activities. In the current study of the top 500 ASX-listed firms, it is estimated that more than one-half (57.1%) employ an internal audit function (IAF). It is believed that relatively few firms within the remaining listed firms employed an independent audit oversight. In addition, Table 5.2 summarises the response rate for each 100 quintile grouping according to the reported market value of their assets. It is evident from the table that the top 100 quintile group comprised the highest number of firms with an internal audit function (IAF). There is clearly a decreasing trend from the first to fifth 100 quintile groups regarding companies employing an internal audit function (IAF). The first and fifth 100 quintile groups consisted of the highest and lowest firms in the sample, respectively, in groups of 100, ranked by the reported market value of their assets. Therefore, as shown in Table 5.2, the distribution of the top 500 companies in 100 quintile groups depicts that larger companies are more likely to have an IAF and are less likely to have no internal audit function (IAF).

Table 5.1: Sample Selection and Industry Breakdown

Panel A: Sample selection process				
1. Initial sampling unit (top 500 companies)			500	
2. Postal questionnaire responses received			111	
3. Remaining number of companies (1 minus 2)			389	
4. Random selection of remaining companies (1/3 of 3)			129	
Total number of usable companies (2 plus 4)			240	
Panel B: Selection of listed companies				
Number of firms listed on ASX during financial year ended 2011			2040	
Exclusions:				
Financial institutions			(281)	
Foreign incorporated firms			(58)	
Firms that are not continuously listed			(124)	
Missing data			(31)	
Total number of firms after exclusions			1546	
Panel C: ASX industry breakdown				
GICS Industry	Population (n=500)		Sample (n=240)	
	Frequency	%	Frequency	%
Consumer Discretionary	65	13.00	36	15.00
Energy	71	14.20	34	14.17
Health Care	35	7.00	15	6.25
Industrials	88	17.60	38	15.83
Information Technology	26	5.20	12	5.00
Materials	170	34.00	88	36.67
Miscellaneous	45	9.00	17	7.08
Total	500	100.00	240	100.00

Note: GICS = Global Industry Classification Standard; Miscellaneous = telecommunications (2.0%), consumer staples (3.4%) and utilities (3.6%).

Table 5.2: Response Rate from Primary and Secondary Sources

	With internal audit	Without internal audit	Response total
Top 500 ASX-listed questionnaire survey firms	60	51	111
Top 500 ASX-listed companies from annual reports	77	52	129
First 100 group quintile of ASX firms (listed in 2011)	57	5	
Second 100 group quintile	27	18	
Third 100 group quintile	23	22	
Fourth 100 group quintile	16	21	
Fifth 100 group quintile	14	37	
Total	137 (57.1%)	103 (42.9%)	240

5.3 Descriptive Statistics of all Variables

This section provides the descriptive statistics for all continuous and dichotomous variables used in this study and is subdivided into two subsections based on different sample representations of the variables. Subsection 5.3.1 contains all the variables of which the

relevant financial and other data were collected from annual reports, presenting a sample of 240 firms. Subsection 5.3.2 includes relevant IAF and internal audit outsourcing (IAO) data obtained directly from questionnaire survey responses from 60 respondents. In the case of the existence of an IAF, data from annual reports were added to the questionnaire responses resulting in the sample size of 240.

5.3.1 Descriptive statistics of variables with a sample size of 240

Table 5.3 provides descriptive statistics of all the continuous variables used in the various regression models of this study, the data of which were collected from annual reports only. These data relate to financial and other pertinent factors likely to influence the likelihood of a firm utilising an internal audit function (IAF). The use of specific corporate governance variables in relation to an IAF was justified in Chapter Three, subsection 3.3.1. Referring to Chapter Four, Section 4.6, the literature review and measurement of control variables justified the use of all control variables in the study. Table 5.3, Panel A shows the financial dependent variable, *DAC*, used in the calculation of discretionary accruals. Chapter Four, subsection 4.4.4 illustrated the measurement of discretionary accruals following the modified Jones model. The variable, *DAC*, has a mean value of 0.02 and standard deviation of 1.14. The mean values increase from -0.34 at the 25th percentile to 0.33 at the 75th percentile. Appendix C provides some insight into how the DAC data are distributed by illustrating the nature of DAC in relation to a sample of the top 500 ASX-listed firms with and without an internal audit function (IAF). Distributions within industry groups are also provided.

Table 5.3, Panel B shows the descriptive statistics of corporate governance variables used in subsequent regression models. The variable, *ACIndep*, shows that, on average, 76.09% of AC members were independent members on the audit committee, and the variability of independent AC membership was 32.68%. *ACIndep* ranged from 67.00% (at the 25th percentile) to 100.00% (at the 75th percentile). The average number of meetings held in the financial year ended 2011 by companies in the sample was 3.47, which is lower than the ASX CGC's recommendation of AC meeting frequency of four (4) times per annum. For

companies in the sample, *ACMeeting* also showed that the variability of meetings was 2.02. The median value of the number of AC meetings was four (4) times for the financial year ended 2011. A one-sample *t*-test showed that the mean value of 3.47 with respect to 4 was statistically significant at $p < 0.05$ level. Goodwin and Kent (2006a) similarly uses Australian Stock Exchange data of year 2000 to explore the factors associated with the existence of internal audit function and reports that on average, there is a lower percentage of non-executives AC members (46%) in the committee and less frequent meeting (2) per year. Table 5.3, Panel B shows descriptive statistics for the two variables related to the board of directors (BOD). The variable, *BODIndep*, indicated that the majority (56.00%) of director on the board were independent. The percentage of independent board directors ranged from 40.00% (at the 25th percentile) to 75.00% (at the 75th percentile) with a variability of 26.02%. However, Goodwin and Kent (2006a) study reports a higher mean percentage (85%) of non-executive directors on the board. The variable, *BODSize*, indicated that companies in the sample had on average 6.5 directors on their boards and the variability of membership was 2.07. Board size ranged from 5.00 members (at the 25th percentile) to 8.00 members (at the 75th percentile) with 6.00 members as the median value.

Table 5.3, Panel C reports details of the financial control variables. Market capitalisation (*MarCap*) was used as a proxy to measure firm size. For the financial year ended 2011, the average market capitalisation of companies in the sample was \$3,283 million. There was a major variation in *MarCap* (firm size) with a range of \$165 million (at the 25th percentile) to \$1,346 million (at the 75th percentile) among the 240 companies in the sample. Leverage (*Lev*) was used to measure firm risk in the various regression models of the study. On average, the leverage of companies in the sample scaled by total assets was 0.06. With a median value of 0.13, *Lev* ranged from 0.00 to 0.26 at the 25th and 75th percentiles, respectively. The proportion of foreign subsidiaries in terms of the total number of subsidiaries (*ForgnSubs*) was a proxy for firm complexity which showed a mean value of 0.38 and standard deviation of 0.35. At the 25th and 75th percentiles, foreign subsidiaries ranged from 0.00 to 0.71, respectively.

Table 5.3: Descriptive Statistics (Continuous Variables)

Variable	Mean	Std. Deviation	25 th Percentile	Median (50 th Percentile)	75 th Percentile
Panel A: Financial dependent variable					
<i>DAC</i>	0.02	1.14	-0.34	-0.03	0.33
Panel B: Corporate governance variables					
<i>ACIndep</i>	76.09	32.68	67.00	100.00	100.00
<i>ACMeeting</i>	3.47	2.02	2.00	4.00	4.00
<i>BODIndep</i>	56.00	26.00	40.00	60.00	75.00
<i>BODSize</i>	6.50	2.07	5.00	6.00	8.00
Panel C: Financial control variables					
<i>MarCap (mil)</i>	3,283	17,336	165	362	1,346
<i>Lev</i>	0.06	0.31	0.00	0.13	0.26
<i>ForgnSubs</i>	0.38	0.35	0.00	0.31	0.71

where:

DAC = Discretionary accruals, used as a proxy in earnings management calculation of company in financial year ended 2011; *ACIndep* = Percentage of independent members on audit committee, used to measure audit committee independence; *ACMeeting* = Number of times audit committee members meet per annum; *BODIndep* = Percentage of independent directors on board; *BODSize* = Number of directors on board; *MarCap* = Market capitalisation defined by total value of issued shares of firm in market at end of financial year 2011; *Lev* = Sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries.

Table 5.4 presents the descriptive statistics of all dichotomous variables used in the study. Data for these variables were collected from annual financial reports. Table 5.4, Panel A shows the descriptive statistics for the two corporate governance variables used in the study's regression models. Audit committee expertise (*ACEExpert*) is a dichotomous audit committee characteristic. 78.9% of audit committees of companies in the sample have at least one member with relevant financial (accounting and non-accounting) expertise. A significant number of selected firms (21.1%) failed to meet this governance criterion. In relation to the separation of the role of board chair from CEO (*BODDuality*), the ASX CGC (2014) in Recommendation 2.4 of its guidelines and recommendations states that the board chair should be an independent director; in particular, he/she should not be the same person as the CEO of the entity. The variable, *BODDuality*, indicated that the majority of companies (71.7%) in the sample have an independent person as chair of the board. Again, a significant number of firms failed to apply this criterion. Table 5.4, Panel B presents the descriptive statistics of one dichotomous control variable, auditor specialist (*AuditorSpecialist*) indicating that 57.1% of the external auditors of companies in the sample are industry specialists. Table 5.4, Panel C reports the descriptive statistics of the seven dichotomous industry variables. The materials (36.7%),

consumer discretionary (17.1%) and industrials (14.6%) sectors have the highest representation of companies within the sample. On the other hand, information technology (5.0%), health care (6.7%), and miscellaneous (7.1%) (comprised of telecommunications [2.0%], consumer staples [3.4%] and utilities (3.6%]) are the three sectors with the least representation of companies within the sample for the financial year ended 2011.

Table 5.4: Descriptive Statistics (Dichotomous Variables)

Variable	Yes	%	No	%
Panel A: Corporate governance variables				
<i>ACExpert</i>	187	78.9	50	21.1
<i>BODDualty</i>	172	71.7	68	28.3
Panel B: Financial control variables				
<i>AuditorSpecialist</i>	137	57.1	103	42.9
Panel C: Industry control variables				
<i>IndustryConDis</i>	41	17.1	199	82.9
<i>IndustryEnergy</i>	34	14.2	206	85.8
<i>IndustryHealthCare</i>	16	6.7	224	93.3
<i>IndustryIndustrials</i>	35	14.6	205	85.4
<i>IndustryInfoTech</i>	12	5.0	228	95.0
<i>IndustryMaterials</i>	88	36.7	152	63.3
<i>IndustryMiscellaneous</i>	17	7.1	223	92.9

where:

ACExpert = Audit committee expertise; *BODDualty* = Board of directors' duality; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryMiscellaneous* = Miscellaneous industries combining consumer staples, telecommunications and utilities.

5.3.2 Descriptive statistics of variables with a sample size of 60

Table 5.5 provides descriptive statistics of two dichotomous variables, *IAF* and *IAO*, used in the various regression models of the study. Data for these two variables were collected from questionnaire responses; however, data on the existence of internal audit function (*IAF*) were also supplemented by annual financial reports' data, thus increasing the usable sample to 240. Referring to Chapter Four, subsection 4.4.1, the questionnaire survey along with annual reports data were combined to collect information on the employment of internal audit by the top 500 ASX-listed companies. Both sources of information were logically and substantially authoritative for this purpose. Within the sample of the top 500 ASX-listed companies examined in this study, 57.1% of the companies have an internal audit function (*IAF*).

Although the ASX CGC recommended that the top ASX-listed companies should have an IAF, a large proportion (42.9%) still appear not to utilise an internal audit function (IAF). A lower percentage of companies with an IAF was also evident in Goodwin-Stewart and Kent's (2006a) study which reported that out of all (approximately 1,400) ASX-listed companies, only one-third used IAFs in 2000.

The existence of internal audit outsourcing (*IAO*) is another dichotomous variable, the data for which were collected from the questionnaire responses (60) only. Questionnaire responses depicted three forms of outsourcing, namely, full, partial or none. The majority (69.4%) of firms outsourced the IAF while the remaining (30.6%) preferred not to engage in any form of outsourcing. Carey, Subramaniam and Ching (2006) who investigated ASX-listed companies in 1998 found that 45.5% of sampled firms with an in-house IAF engaged in partial or full outsourcing. It would be interesting to know why the situation appears to have changed during the past decade.

Table 5.5: Descriptive Statistics of Frequency of Internal Audit and Outsourcing for Sample Data

Variable	Yes	%	No	%	Sample
Existence of internal audit function (IAF)	137	57.1	103	42.9	240
Existence of internal audit outsourcing (IAO)	50	69.4	22	30.6	60

where:

IAF = Existence of internal audit function; *IAO* = Existence of internal audit outsourcing.

Table 5.6 provides descriptive statistics of the extent of internal audit outsourcing (*ExtentIAO*) used by firms in the sample, with this variable continuous (%) in nature. In all 60 companies responded to the questionnaire and provided details relating to the extent of internal audit outsourcing (IAO). Of the 60 responding companies, 44 engaged in full or partial outsourcing. Therefore, Table 5.6 below presents information from 44 companies. On average, 44.36% of internal audit activities were fully or partially outsourced by respondent firms with a median value of 33.00%. The range of outsourcing in the financial year ended 2011 started from 10.00% (at the 25th percentile) to 75.00% (at the 75th percentile). The study shows that

majority of sample companies (44 out of 60) are involved with outsourcing for financial year ended 2011 in Australia.

Table 5.6: Descriptive Statistics of Outsourcing Extent

Variable	Mean	Std. Deviation	25 th Percentile	Median (50 th Percentile)	75 th Percentile
<i>ExtentIAO</i>	44.36	35.55	10.00	33.00	75.00

where:

ExtentIAO = Extent of internal audit outsourcing of the listed company in financial year ended 2011.

5.3.3 Descriptive statistics of variables relating to internal audit quality of a sample size of 60

Detailed information on the six internal audit quality (*IAQ*) variables was collected from the questionnaires with the demographics limited to a sample of 60 ASX-listed firms. A summary of the frequency of firms that comprised this sub-sample is provided in Table 5.12 and is arranged in order of size (100 quantile units) and industry. Questionnaire responses provided some qualitative information about the Chief Audit Executives (CAEs) (or their equivalents) and some related to internal audit staff and structures that related to the quality of the internal audit function (IAF). Appendix A provides the original information relating to CAEs (or their equivalents) and the internal audit structure on which responses were sought in the questionnaire survey.

Six factors were used to measure internal audit quality (*IAQ*) (refer to Chapter Four, subsection 4.5.3 for information relevant to the measurement of *IAQ* variables). Table 5.7 provides descriptive statistics of the five continuous variables used to measure internal audit quality (*IAQ*). The variable, *IAQ* certification (*IAQCert*), reported on the percentage of internal audit staff with professional certifications (e.g., CIA, CPA, ICA) that ranged from 91.67% to 100.00% at the 25th and 75th percentiles, respectively. On average for each respondent firm, 90.94% of internal audit staff held professional qualifications. In terms of the years of experience (*IAQExperi*) of internal audit staff, the average was 8.05 years with variability in the internal audit experience of 3.94 years. Internal audit experience varied from

5.64 years to 9.00 years at the 25th and 75th percentiles, respectively. The variable, *IAQSize*, indicated the amount of budget spending on internal audit during the financial year ended 2011. The average amount spent by the companies in the sample on performing internal audit in the financial year ended 2011 was \$15.77 million and the standard deviation was \$20.60 million indicating that there was not a large variation between internal audit budgets. The range of spending on internal audit within companies in the sample started from \$1.73 million with the upper amount being \$22.45 million at the 25th and 75th percentiles, respectively. The next variable, *IAQTrain*, depicted the level of adequate training for the team of internal auditors. Internal audit teams as a group reported an average level of training adequacy of 4.03 out of 7 along the Likert scale, with 3 being approximately the middle level of training. Finally, the IAQ continuous variable, *IAQTimeFin*, reported the percentage of internal audit time spent on performing routine financial audits. On average, 22.32% of internal audit time is spent on performing these duties. The variable, *IAQTimeFin*, ranges from 10.00% to 30.00% at the 25th and 75th percentiles, respectively, with a standard deviation of 14.86%.

Table 5.7: Descriptive Statistics of IAQ Variables

Variable	Mean	Std. Deviation	25 th Percentile	Median (50 th Percentile)	75 th Percentile
<i>IAQCert</i>	90.94	19.86	91.67	100.00	100.00
<i>IAQExperi</i>	8.05	3.94	5.64	7.29	9.00
<i>IAQSize (mil)</i>	15.77	20.60	1.73	8.09	22.45
<i>IAQTrain</i>	4.03	1.33	3.00	4.00	5.00
<i>IAQTimeFin</i>	22.32	14.86	10.00	20.00	30.00

where:

IAQCert = Percentage of internal auditors including head of internal audit with relevant professional certification (CIA, CPA or others); *IAQExperi* = Average number of years of internal auditing experience of internal auditors including the head of internal audit; *IAQSize* = Company's investment in dollar amount (millions) on internal audit function; *IAQTrain* = Average number of hours of training completed by internal auditor during financial year ended 2011; *IAQTimeFin* = Percentage of time internal auditors spent on performing financial audits.

Table 5.8 provides descriptive statistics of the one dichotomous variable used to measure internal audit quality. Chapter Four, subsection 4.5.3 provided information describing how this variable was measured. Internal audit quality objectivity (*IAQObject*) indicates to whom CAEs (or their equivalents) report functionally, and whether they have direct private

access to the audit committee (AC) or board of directors (BOD). The descriptive statistics indicated that a majority (63.3%) of internal auditors from the companies in the sample reported to the audit committee (AC) (or a combination of the audit committee (AC) with other authoritative persons) and had direct private access to the audit committee (AC). The balance (36.7%) reported to the board of directors (BOD), Chief Executive Officer (CEO) or Chief Financial Officer (CFO) but not to the audit committee (AC) to whom they had no access.

Table 5.8: Descriptive Statistics of IAQ Variable

Variable	Yes	%	No	%
<i>IAQObject</i>	38	63.3	22	36.7

where:

IAQObject = Objectivity, a measure of internal audit quality.

5.4 Correlation Analysis

Correlation analysis indicates the degree of association between any two or more variables subject to review. This section provides correlation coefficients which show the strength of potential associations between variables, ranging from a value of +1 to -1, where +1 and -1 indicate a perfect positive and negative relationship, respectively. An insignificant relationship between any two variables is implied where the coefficient fails to meet the stated criteria (e.g., $p < 0.05$). Pearson's bivariate correlations are used in this study to demonstrate the strengths of potential linear relationships between two variables. It is maintained that these recordings are not high enough to signify concerns about multicollinearity (Hair et al. 2010). None of the correlations between independent variables present coefficients of 0.80 or above suggesting multicollinearity is not an issue. Data on *IAF* (a dichotomous variable for the existence of internal audit function) and *DAC* were collected from a sample size of 240 ASX companies. Furthermore, data on *IAO* (a dichotomous variable for the existence of internal audit outsourcing), the extent of *IAO* (scale variable) and variables of *IAQ* used to execute these regressions were collected from the 60 questionnaire responses.

Table 5.9 presents analysis using Pearson's bivariate correlations of all the continuous

and dichotomous variables used in the regression analyses associated with all the study's hypotheses. This correlation matrix highlights significant correlations among dependent, independent and control variables. Firstly, in consideration of the association of audit committee (AC) and board of directors' (BOD) effectiveness with the existence of an internal audit function (IAF), Table 5.9 presents that *IAF* is significantly positively correlated with five independent corporate governance variables, namely, *ACIndep*, *ACMeeting*, *BODIndep*, *BODSize* and *BODDuality*. This implies a potential relationship between the presence of an internal audit function (IAF) and each of the audit committee (AC) and board of directors' (BOD) variables. Given evidence of past research attesting to the relationship between corporate governance practices and internal control management, potential relationships were again anticipated to arise. In Table 5.9, significant correlations between *AC* and *BOD* variables were inevitable and varied between 0.127 and 0.531: this could be rationally discussed as being issues that explained the management of governance arrangements (as stipulated by the ASX listing recommendations).

The percentage of independent audit committee (AC) members and the number of audit committee (AC) meetings per annum were positively and significantly related to the existence of internal audit function (*IAF*). Furthermore, the percentage of independent directors on the board of directors (BOD), the total number of directors and the separation of the role of board chair from that of the CEO (Chief Executive Officer) were positively and significantly related to the existence of internal audit function (*IAF*). Considering the control variables, *IAF* is positively significantly correlated with *LogMarCap*, *SQRTLev* and *AuditorSpecialist* which are proxies for measuring firm size, risk and auditor (external) firm quality, respectively. On the other hand, *ForgnSubs*, a proxy for measuring firm's complexity, is negatively but not significantly correlated with *IAF* (the existence of internal audit function). Secondly, in consideration of the association of audit committee (AC) and board of directors' (BOD) effectiveness and attributes of internal audit quality (IAQ) with the existence of internal audit outsourcing (IAO), the likelihood that a firm outsources its internal audit function (IAF)

(represented by *IAO* in the table) was significantly positively correlated with just one corporate governance variable, namely *BODSize*. This correlation suggests a potential relationship between *BODSize* and the outsourcing of internal audit function (IAF) activities.

The top listed companies are expected to have sufficient audit committee (AC) members to manage business requirements and to be likely to conform to the previously mentioned recommendation of the ASX Corporate Governance Council (CGC) (2007). Of the other independent variables, none of the *IAQ* variables was significantly related to *IAO* (independent audit outsourcing). Only one of the listed control variables, that is, *ForgnSubs* was significantly correlated with *IAO* (independent audit outsourcing). The variable, *ForgnSubs*, was used as a proxy for firm complexity and indicated that firms with complex business operations were more likely to engage in internal audit outsourcing (*IAO*). Thirdly, in terms of the association of audit committee (AC) and board of directors' (BOD) effectiveness and attributes of internal audit quality (IAQ) with the extent of internal audit outsourcing (IAO), the designated dependent variable, *ExtentIAO*, was strongly positively correlated with *ACIndep*, a corporate governance variable. It was found that the extent to which outsourcing was used was likely to be influenced by a higher proportion of independent members on an audit committee (AC). The extent of internal audit outsourcing (*ExtentIAO*) in Hypotheses H_{3a1}, H_{3a2}, H_{3a3}, H_{3b1}, H_{3b2} and H_{3b3}; H_{3c1}, H_{3c2}, H_{3c3}, H_{3c4} and H_{3c5}; and H_{3c6} correlated with none of the other listed independent variables, with the exception of *IAQObject*. This variable of internal audit quality demonstrated a strong negative correlation with *ExtentIAO* for the 60 tested firms.

Table 5.9 also presents the correlation between the variables used in Hypotheses H₄, H₅ and H₆ to examine the association of *IAF*, *IAO* and *ExtentIAO* with *DAC* (discretionary accruals). In consideration of these hypotheses, *DAC*, a proxy used to measure earnings management, was the dependent variable that identified the extent to which firms were likely to questionably manipulate or undertake earnings management. In this instance, *DAC* was not significantly correlated with the presence of *IAF* (a dichotomous variable). In terms of the

control variables used in Hypothesis H₄, *SQRTLev*, *ForgnSubs* and *AuditorSpecialist* were significantly correlated with *DAC* (discretionary accruals). The variable, *SQRTLev*, was positively correlated with *DAC*, while *ForgnSubs* and *AuditorSpecialist* were negatively correlated with *DAC* (discretionary accruals). The correlations suggest that more highly leveraged firms were more likely to record discretionary accruals (*DAC*), whereas firms with more foreign subsidiaries and which made use of audit specialist firms were less likely to report discretionary accruals (*DAC*). In addition, the variable, *IAO*, was not significantly correlated with the dependent variable *DAC* (discretionary accruals). None of the other independent variables of *IAQ* was significantly related to *DAC* (discretionary accruals). In terms of control variables, *SQRTLev*, *ForgnSubs* and *AuditorSpecialist* were significantly correlated with *DAC* (discretionary accruals). The variable, *SQRTLev*, was positively correlated with *DAC*, and *ForgnSubs* and *AuditorSpecialist* were negatively correlated with *DAC* (discretionary accruals).

As mentioned in subsection 5.4.1, more highly leveraged firms are likely to have more discretionary accruals (*DAC*) whereas firms with more foreign subsidiaries or who make use of audit specialists are less likely to report discretionary accruals (*DAC*). Finally, the designated independent variable, *IAOExtent*, was also not significantly correlated with the dependent variable, *DAC* (discretionary accruals). The variable, *DAC*, was not significantly correlated with other *IAQ* independent variables. In terms of the control variables used in Hypotheses H₆, H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e}, H_{7f}, the variables, *SQRTLev*, *ForgnSubs* and *AuditorSpecialist* were again significantly correlated with *DAC* (discretionary accruals). The variable, *SQRTLev*, was positively correlated with *DAC*, and *ForgnSubs* and *AuditorSpecialist* were negatively correlated with *DAC* (discretionary accruals). As indicated in earlier sections, more highly leveraged firms were likely to report more discretionary accruals (*DAC*) whereas firms with more foreign subsidiaries and that made use of audit specialists were less likely to report discretionary accruals (*DAC*).

Table 5.9: Pearson's Correlation Coefficients of the Variables

	<i>IAF</i>	<i>IAO</i>	<i>Extent IAO</i>	<i>AC Indep</i>	<i>AC Expert</i>	<i>AC Meeting</i>	<i>BOD Indep</i>	<i>BOD Size</i>	<i>BOD Duality</i>	<i>IAQ Cert</i>	<i>IAQ Experi</i>	<i>IAQ Size</i>	<i>IAQ Train</i>	<i>IAQ Object</i>	<i>IAQ Time Fin</i>	<i>DAC</i>	<i>Log Mar Cap</i>	<i>SQRT Lev</i>	<i>Forgn Subs</i>	<i>Auditor Specialist</i>
<i>IAF</i>	1																			
<i>IAO</i>	^a	1																		
<i>ExtentIAO</i>	-.170	.609**	1																	
<i>ACIndep</i>	.366**	.112	.304*	1																
<i>ACExpert</i>	.124	.102	.139	.245**	1															
<i>ACMeeting</i>	.301**	.121	.250	.387**	.268**	1														
<i>BODIndep</i>	.220**	.137	.183	.531**	.157*	.279**	1													
<i>BODSize</i>	.342**	.283*	.138	.240**	.230**	.436**	.127*	1												
<i>BODDuality</i>	.277**	.002	.250	.260**	.099	.155*	.321**	.207**	1											
<i>IAQCert</i>	-.060	.019	.031	.016	.135	-.048	.011	-.261*	.122	1										
<i>IAQExperi</i>	.035	.080	.069	.156	-.037	.027	.171	-.046	.074	.076	1									
<i>IAQSize</i>	-.037	-.041	.182	.070	-.120	.191	-.076	-.075	-.088	-.213	-.208	1								
<i>IAQTrain</i>	-.095	.053	-.129	-.137	.103	.061	.047	.110	.038	.137	-.029	.002	1							
<i>IAQObject</i>	.171	-.245	-.566*	-.134	-.199	-.167	-.301*	-.048	-.175	.082	.004	-.240	-.042	1						
<i>IAQTimeFin</i>	.109	.068	.156	.304*	.151	..040	.018	.024	.285*	.056	.074	.200	-.169	-.122	1					
<i>DAC</i>	.000	-.097	-.088	.073	-.051	-.028	.114	-.010	.122	.019	-.027	-.013	.067	-.008	-.181	1				
<i>LogMarCap</i>	.343**	.017	110	.225**	.135*	.160*	.121	.246**	.191*	.009	.059	-.182	.035	-.051	.232	.050	1			
<i>SQRTLev</i>	.153*	.080	.190	.162*	.096	.173*	.121	.192**	.035	-.123	.035	.054	.065	-.111	-.052	.180*	.157*	1		
<i>ForgnSubs</i>	-.099	.243*	.135	-.037	-.001	.003	.014	.025	-.029	.117	.178	-.082	-.210	-.036	.267*	-.159*	-.033	-.126	1	
<i>Auditor Specialist</i>	.184**	.105	.001	.160*	.124	.138*	.093	.252**	.071	-.118	-.137	-.074	-.018	.057	.086	-.169**	.239**	-.038	.094	1

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed); ^aCannot be computed because at least one of the variables is constant.

where:

IAF = Existence of internal audit function; *IAO* = Existence of internal audit outsourcing; *ExtentIAO* = Percentage of internal audit outsourcing of listed company in financial year ended 2011; *ACIndep* = Percentage of independent members on audit committee, used to measure audit committee independence; *ACEExpert* = Audit committee expertise; *ACMeeting* = Number of times audit committee members meet per annum; *BODIndep* = Percentage of independent directors on board; *BODSize* = Number of directors on board; *BODDuality* = Separation of role of board chair from CEO; *IAQCert* = Percentage of internal auditors including head of internal audit with relevant professional certification (CIA, CPA or others); *IAQExperi* = Average number of years of internal auditing experience of internal auditors including head of internal audit; *IAQSize* = Company's investment in dollar amount (millions) on internal audit function; *IAQTrain* = Average number of hours of training completed by internal auditor during financial year ended 2011; *IAQObject* = Objectivity, a measure of internal audit quality; *IAQTimeFin* = Percentage of time internal auditors spent on performing financial audits; *DAC* = Discretionary accruals used as a proxy for earnings management calculation of company in financial year ended 2011; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist.

5.5 Descriptive Statistics of Internal Audit Outsourcing Information

Substantial information about the nature and extent of the outsourcing programs for ASX-listed firms, including management policies in relation to how these programs were applied, was provided by the 60 Chief Audit Executive (CAE) respondents (or their equivalents) for the year ended 2011 (refer to the relevant questions included in the postal questionnaire in Appendix A, Part D). In this section, quantitative as well as qualitative information was provided by respondents. The 60 companies that responded to this section represented a material subset of the 111 firms who provided responses to the postal survey. The remaining 51 respondents clearly indicated that they had no internal audit function (IAF) and therefore left the details section of the questionnaire incomplete. The financial reports of companies included in the sampling process provided little or no useful information about the internal audit function (IAF) except to indicate whether or not the company employed such a function. In all, 44 of the 60 firms that completed the questionnaires recorded partial or complete outsourcing of the IAF, while the balance (16) managed the function using their own internal resources. Although the sample was relatively small in number, the information provided by the 60 CAE respondents (or their equivalents) provided very useful insights into the application and management of outsourcing within ASX-listed firms: this section presents a summary of those data. The time frame for the receipt of the 60 responses was relatively short (eight weeks) and it is believed that there is unlikely to be any significant non-response bias associated with the information, much of which is objective and involves relatively few subjective opinions and ratings.

Table 5.10 provides information by size, provision and industry about the 60 companies that responded to the questionnaire, in relation to internal audit outsourcing (IAO). These 60 company respondents all have an IAF within the company with or without internal audit outsourcing (IAO). Table 5.10, Panel A shows the frequency and percentage of the 60 ASX-listed companies divided into three groups in order of their size which was measured on the basis of market capitalisation. The highest 27 (45.0%) of the respondent companies belonged

to the top 100 ASX-listed firms which suggests that larger companies are more likely to engage in outsourcing their IAF activities. Interestingly, 18 of the 27 top 100 companies reported some form of internal audit outsourcing (IAO). As firms diminish in size in terms of their market capital value, so also does the incidence of the use of an IAF with or without outsourcing (probably in line with their IAF usage). In terms of internal audit provision, Table 5.12, Panel B and Figure 5.1 together indicate that 16 of the 60 respondent companies (26.67%) mentioned performing an IAF in-house. The remaining 44 companies outsourced the IAF either partially or fully providing a response rate of 61.67% and 11.67%, respectively. Referring to Section 5.2 of this chapter, respondent companies were classified into seven industry sectors with consumer staples, telecommunications and utilities subsequently combined and recorded as miscellaneous industries in Table 5.12, Panel C and Figure 5.2. Of the industry sectors, materials represented the highest percentage (26.66%) followed by industrials (25.00%) and consumer discretionary (18.33%) firms in terms of internal audit practices either with or without outsourcing. This distribution of companies between the industry sectors followed a similar pattern to the industry breakdown of companies in the sample as recorded in Table 5.1, Panel C. This industry breakdown showed that companies with the three highest representations were in the materials, industrials and consumer discretionary industry sectors.

Table 5.10: Comparative Descriptive Statistics of 60 Respondent Companies

	Year 2011	
	Frequency	Percentage of sample
Panel A: Organisation size		
Top 100 ASX-listed firms	27	45.00
101–300	23	38.33
301–500	10	16.67
Total	60	100.00
Panel B: IAF provision		
In-house (no outsourcing)	16	26.67
Partly outsourced	37	61.67
Fully outsourced	7	11.66
Total	60	100.00
Panel C: Industry		
Consumer Discretionary	11	18.33
Energy	4	6.67
Health Care	4	6.67
Industrials	15	25.00
Information Technology	1	1.67
Materials	16	26.66
Miscellaneous	9	15.00
Total	60	100.00

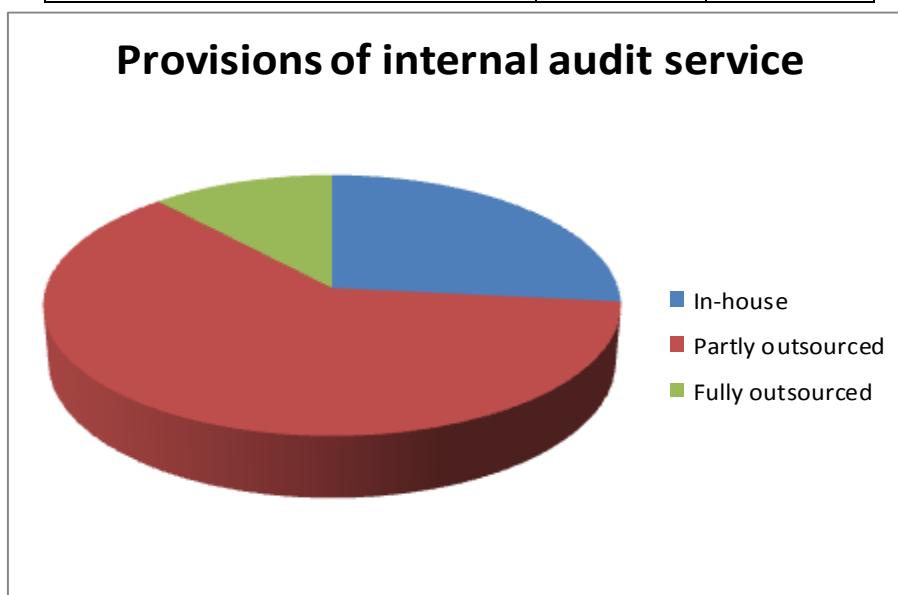


Figure 5.1: Provision of Internal Audit Services

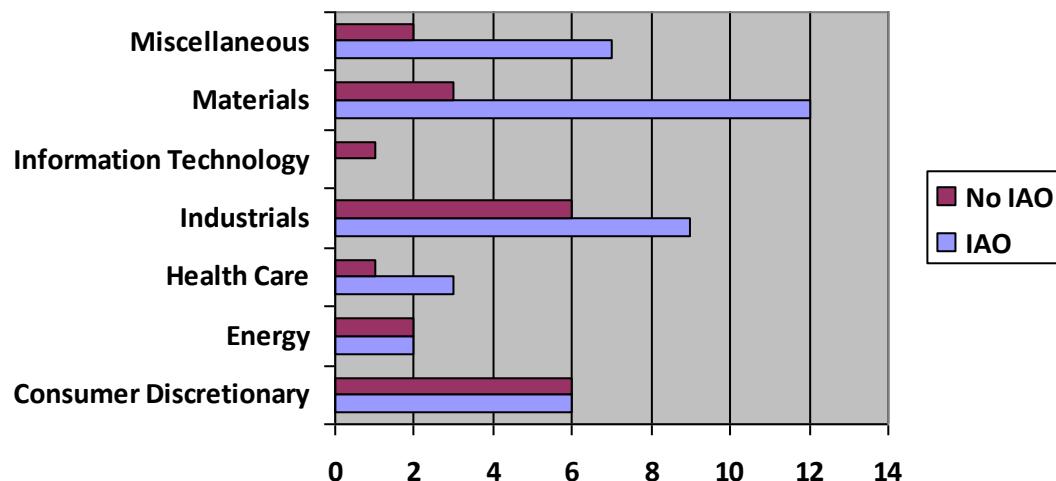


Figure 5.2: Breakdown of Industries based on IAO

Table 5.11 and Figure 5.3 together represent information on providers of internal audit outsourcing (IAO) services. The 44 respondents from companies that either partly or fully outsourced their IAFs were asked to provide the names of firms that provided their outsourced services. It is evident from Table 5.11 below that the majority (30 out of 44; 68.18%) of the companies outsourced to the Big Four accounting firms who also were not their company's current external auditors. There are no restrictions on ASX-listed companies regarding outsourcing to their current external auditors; however, data from the survey revealed that companies were following the ASX CGC recommendation not to outsource to current external auditors to ensure auditor independence requirements. A few organisations (4 out of 44) outsourced to their current external auditor during 2011. Firms also outsourced to internal audit specialists, other than the Big Four or non-Big Four accounting firms, who were used to provide some specialised services.

Table 5.11: Providers of Internal Audit Outsourcing Services

	Year 2011	
	Frequency	Percentage
Current external auditor	4	9.09
Other Big Four accounting firm	30	68.18
Other non-Big Four accounting firm	6	13.63
Internal auditor specialist	2	4.55
Other	2	4.55
Total	44	100.00

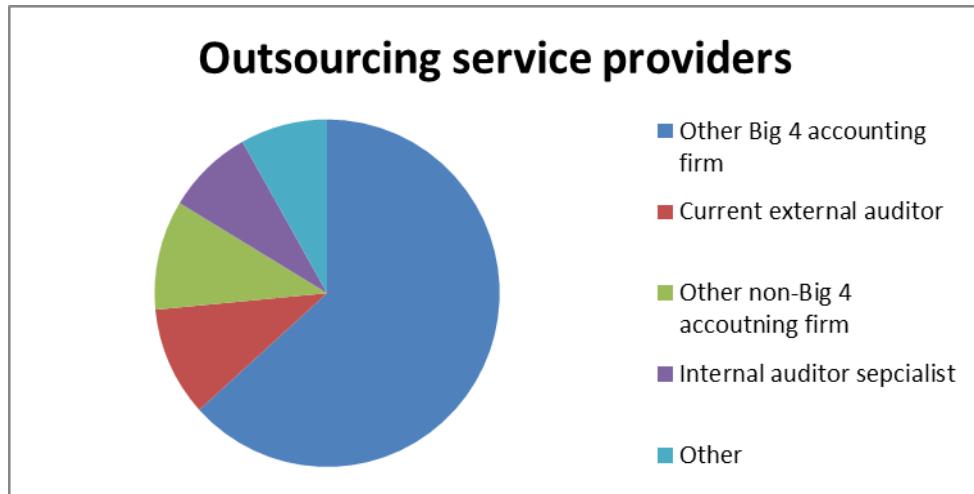


Figure 5.3: Outsourcing Service Providers

Survey respondents were also asked to provide information on the types of activities outsourced to draw attention to routine or non-routine internal audit activities and the extent to which they were outsourced during 2011 (refer to Question 5, Part D of the questionnaire in Appendix A). Financial audits along with compliance and operational audits were considered as routine internal audit activities for data collection purposes. As expected, Table 5.12 indicates that the majority of respondents (of the 60 responses received) referred to financial, compliance and operational audits as routine activities. Furthermore, as shown on Table 5.12 and Figure 5.4, the 44 respondents with outsourcing indicated that the above three common routine internal audit activities tended not to be outsourced to external providers. In Figure 5.4, the x-axis refers to the total number of IAFs conducted and the y-axis refers to the frequency of different types of internal audit activities. As shown on the figure, reviews of the information system, performance and risk management along with fraud investigations were mainly outsourced and were considered by respondents to be non-routine internal audit activities.

Table 5.12: Types of Activities Outsourced

	Year 2011			
	Routine	Total	Outsourced	Total
	Frequency		Frequency	
Financial audit	45	60	14	44
Operational audit	45		13	
Compliance audit	39		8	
Information system review	28		37	
Performance review	5		36	
Risk management review	15		33	
Fraud investigation	4		35	
Special audit	5		31	

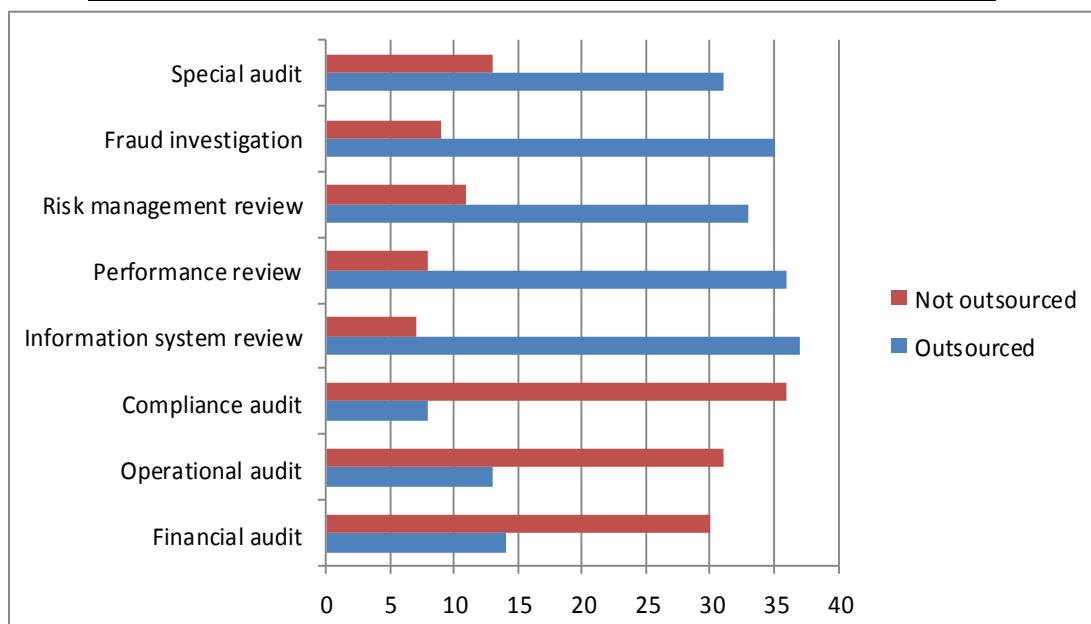


Figure 5.4: Types of Internal Audit Activities Outsourced

In Question 6, Part D of the questionnaire, respondents were also asked to indicate their reasons for outsourcing to external providers. As shown on Table 5.13, the most frequent reason given for outsourcing was clearly receiving industry specialist expertise and knowledge from external providers, followed closely by independence of providers. Cost effectiveness and outsourcing being a company strategy were of less relevance to responding firms.

Table 5.13: Rationale for Outsourcing

Reasons of outsourcing	Frequency	Total
External providers being industry specialists	34	44
External providers being independent	31	
External providers being more cost effective	8	
External providers being flexible	13	
Company strategy	8	

Respondents were asked in Question 7, Part D of the questionnaire to state their company's views about the quality of the provided outsourced services, using a 7-item Likert scale. From Table 5.14 below, it is evident that the majority of the respondents preferred a rating of between 4 and 6 points, indicating that the majority were satisfied with the quality of services received. Respondents mentioned that better quality, expert knowledge and efficiency in the audit process were the main motivators for this level of satisfaction. Only one respondent expressed dissatisfaction with the services received from external providers, mentioning that outsourcing providers lacked context when making recommendations. Three respondents were uncertain about the quality of services received and indicated mixed reviews about the costs and benefits of outsourcing services received. For further analysis, a one sample *t*-test using the middle value of 4 in the Likert scale to evaluate the significance of the satisfaction level resulted in a mean score of 4.29 which appears to be significantly greater than the mid-point ($p < 0.05$). Therefore, the average number of respondent firms with internal audit outsourcing (IAO) (44) appeared reasonably satisfied with the quality of outsourcing service providers.

Table 5.14: Level of Satisfaction with the Quality of Services Provided

	Frequency	Total
Totally unsatisfied ↓		
0	-	
1	1	
2	-	
3	9	
4	8	
5	17	
6	3	
Totally satisfied ↑		
		44

In considering future plans to outsource over the next three years, more than half (24) of the 44 respondents whose organisations outsourced the internal audit function (IAF) indicated that they would maintain similar levels of outsourcing in the future. Many respondents mentioned that they were happy with the current mix of in-house and outsourced internal audit function (IAF). A few (9) respondents planned to decrease the extent of outsourcing so they could increase in-house resourcing and develop audit as a source of talent within the company. Four respondents wanted to increase the extent of outsourcing without mentioning any specific reason.

In response to Question 9, Part D of the questionnaire, respondents with no outsourcing (16) provided some important reasons for this decision. In their responses, six respondents mentioned having adequate internal resources, an internal audit plan and program strategies that discouraged outsourcing. Four respondents preferred to do the work in-house and did not want to give access to external parties. Two respondents mentioned cost issues and limited budgets which motivated in-house audits. Three respondents stated that external assistance was not required for any schedule or review undertaken by the company. Therefore, these companies preferred to manage their internal audit function (IAF) in-house rather than outsourcing to an external auditor.

The questionnaire responses also highlighted some interesting observations from the 16 respondents who had an internal audit function (IAF) but no outsourcing. Of these 16 respondents, half (8) were not sure whether the company would start outsourcing in the

future. They mentioned that they might use specialists to undertake specialised work. Only one respondent mentioned a plan to start outsourcing in the near future due to company needs, for example, information technology (IT) security knowledge. This company will engage external service providers for this purpose. Seven of the other respondents did not intend to start outsourcing in the near future.

The questionnaire survey revealed some interesting observations about internal audit outsourcing (IAO) practices in Australia which were not available in financial reports.

5.6 Summary of the Chapter

This chapter provided information on the sample selection process along with descriptive statistics of variables used in the regression models. The full sample and its industry breakdown were provided for the analysis where possible; however, most of the process was determined by the resulting response rates. A relatively small number of firms provided detailed answers to questions, especially those relating to audit programs and outsourcing policies. Fortunately, limited amounts of information were recoverable from financial reports for the year ended 2011. The chapter next presented descriptive statistics for all continuous and dichotomous variables, for which the data were collected from the two sample sizes (240 and 60 respectively). More complete data were obtained from respondents who fully completed the questionnaires. Furthermore, Pearson's correlation coefficient matrices were presented in three separate tables to show correlations between variables used in the various regression models. It should be noted that these identified only the potential relationship and not the direction thereof. Multicollinearity issues between the variables were also examined. Finally, the chapter provided descriptive data from the qualitative information about the internal audit function (IAF) with or without outsourcing. Details of this outsourcing information were collected from the questionnaire survey only and were not available through annual reports.

Chapter Six discusses the main regression results of this study. Firstly, the chapter presents multivariate results of the regression analyses that investigated the association of audit

committee (AC) effectiveness and board of directors' (BOD) effectiveness with the internal audit function (IAF). This is followed by the investigation of the association of the same corporate governance mechanisms and internal audit quality (IAQ) with internal audit outsourcing (IAO) and the extent of internal audit outsourcing (IAO). Later, the chapter provides multivariate regression results of the hypotheses that investigated the association of the internal audit function (IAF) with discretionary accruals (DAC), followed by the results between the existence and extent of internal audit outsourcing (IAO) and internal audit quality (IAQ) with discretionary accruals (DAC). Finally, the chapter concludes with a summary.

Chapter Six: Multivariate Data Analysis

6.1 Overview of the Chapter

Chapter Five provided the descriptive statistics of the variables used in the various regression models designed for this study. The chapter first outlined the sample selection process and breakdown of industries associated with the final usable sample. Descriptive statistics of 240 ASX-listed firms, combining the data from the questionnaire survey and annual reports, were presented separately from the descriptive statistics of those 60 respondent firms that completed the questionnaires. Furthermore, qualitative data relating to internal audit outsourcing (IAO) were also provided. Finally, Pearson's bivariate correlation analyses were conducted, identifying possible associations as well as correlations between variables.

Chapter Six reports and discusses the main empirical results of this study in the same order in which the hypotheses were discussed in Chapter Three. Firstly, multivariate results of the regression analyses are presented to test the association of corporate governance characteristics (audit committee [AC] effectiveness and board of directors' [BOD] effectiveness) with the existence of the internal audit function (IAF). This is followed by the multivariate results obtained by examining the association of the same corporate governance characteristics and internal audit quality (IAQ) with the existence and extent of internal audit outsourcing (IAO). Later, the chapter provides additional multivariate regression analysis results from testing the association between the existence of the internal audit function (IAF) and discretionary accruals (DAC). This is followed by multivariate results from examining the association of the existence and extent of internal audit outsourcing (IAO) and internal audit quality (IAQ) with discretionary accruals (DAC). Finally, the chapter concludes with a summary.

6.2 Corporate Governance Characteristics and Existence of Internal Audit Function

This section provides the multivariate results from examining the association between two important corporate governance characteristics, namely, audit committee (AC) and board of directors' (BOD) effectiveness and the likelihood that ASX listed-firms would employ an

internal audit function (IAF) for the financial year ended 2011. For the purpose of this analysis, the corporate governance functions associated with the BOD and AC are treated separately with respect to the multivariate results of logistic regression. Although duties associated with each governance component are necessarily related, AC functions are more likely to be associated with IAFs, while the board structures deal with wider strategic management issues. In Chapter Five, Table 5.9 showed the degree of potential overlap of correlations with respect to the governance variables and significant relationships that are not believed to affect the regression results.

Following the two logistic regression analyses discussed in subsections 6.2.1 and 6.2.2, the sample size is 240 ASX-listed firms. Logistic regression is appropriate when the dependent variable is dichotomous and the independent variables are dichotomous and/or continuous (Kleinbaum 1994). Therefore, binary logistic regression, specifically the confirmatory specification model, is applied to test the hypotheses where the nature of the dependent variable is the likelihood of having an internal audit function (IAF) and internal audit outsourcing (IAO). The confirmatory specification method helps to achieve maximum predictive accuracy in the case of a dichotomous dependent variable (Hair et al. 2010, p. 191).

6.2.1 Audit committee effectiveness and existence of internal audit function

Table 6.1 provides the results of the logistic regression to test the hypotheses of the association between AC effectiveness and the existence of the internal audit function (IAF) (H_{1a1} , H_{1a2} and H_{1a3}) (refer to Chapter Three, subsection 3.3.1). This logistic regression uses a single dichotomous variable, existence of internal audit (IAF), as the dependent variable and examines its association with three audit committee (AC) effectiveness attributes ($ACIndep$, $ACEExpert$ and $ACMeeting$) as independent continuous variables for the sample of 240 ASX firms listed in 2011. Table 6.1 also lists applicable beta coefficients which may be interpreted in a similar fashion to those provided in ordinary least squares (OLS) regression results. However, due to the dichotomous nature of the dependent variable, the results need to be interpreted differently as the beta coefficients actually represent measures of the change in the

ratio of probabilities or odds. Hence, there is a need to calculate exponentiated logistic coefficients (Exp (B)). The Wald statistic assesses the value of each beta coefficient and, in this instance, a value less than 0.05 indicates that the variable meets the criterion for predicting group membership.

The logistic analysis suggests that the AC values for the level of AC independence (*ACIndep*) and the number of AC meetings held during the year (*ACMeeting*) provide significant odds that a one-unit change in these independent variables will increase the likelihood that an ASX-listed firm will employ an internal audit function (IAF). The percentage change in odds can be calculated:

$$\% \text{ change in odds} = (\text{Exp (B)} - 1.0) * 100$$

By referring to the equivalent exponentiated coefficients in Table 6.1, it is possible to predict that:

1. A one-unit increase in the percentage of the level of AC independence increases the odds that an ASX-listed firm will employ an IAF by 38.6%.
2. A one-unit increase in the number of meetings of the AC during the year increases the odds that an ASX-listed firm will employ an IAF by 110.5%.

This outcome suggests that Hypotheses H_{1a1} and H_{1a3} can be accepted. The variable *ACEExpert* fails to meet the criteria for significance for this sample of ASX firms and H_{1a3} is therefore rejected. As expected, the control variable *LogMarCap* (a proxy for firm size) explains a significant component of the variation in probabilities following a one-unit increase in its value. An interesting outcome that is examined further in Chapter Seven involves the industry sector for industrials firms ($n=38$) making up the sample (*IndustryIndustrials*). For this dummy variable, the Exp(B) coefficient is 0.246 (beta coefficient negative) indicating that, when comparing industrials firms to materials firms (*IndustryMaterials*, the largest sector), a unit increase in the number of industrials firms will translate into a reduction in the odds of 75.4% that an ASX-listed firm will employ an internal audit function (IAF).

The goodness of fit for the logistic regression model meets the requirements in this instance and can be supported from the data provided in Table 6.1, namely:

Estimation fit:

- Between model comparisons ($\Delta-2LL$ value) = 322.752 to 234.570, a decrease of 88.182 (significant improvement in model fit following changed model specifications).
- Pseudo R^2 values, including Cox and Snell's R^2 and Nagelkirke's R^2 values, suggest that the model explains around 30% of the variation in the dependent variable.

Predictive accuracy:

- Hosmer and Lemeshow's chi-square-based measure prediction of the dependent variable. In this instance, the variation between classes is non-significant (0.690).
- Hit ratio (classification accuracy) of 76.8% which shows a high percentage of cases are correctly classified.

Table 6.1: Logistic Regression Analysis of Existence of Internal Audit and Audit Committee Attributes for Financial Year ended 2011

Variables	n=240		
	Beta Coeff.	Wald Statistic	Exp(B)
Constant	15.134	1.000	1.018
<i>ACIndep</i>	0.018	0.003*	1.386
<i>ACExpert</i>	0.327	0.444	2.772
<i>ACMeeting</i>	0.744	0.002*	2.105
<i>LogMarCap</i>	1.020	0.000*	2.772
<i>ForgnSubs</i>	-0.585	0.220	0.557
<i>AuditorSpecialist</i>	-0.458	0.186	0.632
<i>IndustryConDis</i>	-0.258	0.842	0.773
<i>IndustryConStaples</i>	-1.325	0.433	0.266
<i>IndustryEnergy</i>	0.358	0.793	1.430
<i>IndustryHealthCare</i>	-0.561	0.694	0.571
<i>IndustryIndustrials</i>	-2.052	0.003*	0.246
<i>IndustryInfoTech</i>	-1.008	0.493	0.365
<i>IndustryTeleCom</i>	-21.675	0.999	0.000
<i>IndustryUtilities</i>	-1.486	0.323	0.226
Goodness-of-Fit Statistics	Value	p-value	
-2 Log-likelihood	234.570	0.000	
Hosmer and Lameshow's X^2	5.620	0.690	
Cox and Snell's R^2	0.311		
Nagelkerke's R^2	0.418		
Pseudo R^2	0.273		
Hit Ratio	76.8%		

Notes: * $p < 0.05$ (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function)

where:

ACIndep = Audit committee independence; *ACExpert* = Audit committee expertise; *ACMeeting* = Audit committee meetings; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

6.2.2 Board of directors' effectiveness and existence of internal audit function

Table 6.2 provides the results of logistic regression used to test the hypotheses of association between BOD effectiveness and the existence of internal audit function (*IAF*) (H_{1b1} , H_{1b2} and H_{1b3}) (refer to Chapter Three, subsection 3.3.1). This logistic regression uses a single dichotomous variable, namely, existence of internal audit function (*IAF*), as the dependent variable and examines its association with three board of directors' effectiveness attributes (*BODIndep*, *BODSize* and *BODDuality*) as independent continuous variables for a sample of 240 ASX firms listed in 2011. Table 6.2, as in Table 6.1, also lists applicable beta

coefficients which may be interpreted in a similar fashion to those provided in the OLS regression results. However, due to the use of a dependent variable with a dichotomous nature, the results have to be interpreted differently as the beta coefficients actually represent measures of the change in the ratio of probabilities or odds. Hence, it is essential to calculate exponentiated logistic coefficients ($\text{Exp}(B)$) in this regression. The Wald statistic assesses the value of each beta coefficient and, in this instance, a value less than 0.05 indicates that the variable meets the criterion for predicting group membership.

The results of this logistic analysis suggest that the BOD values for the number of directors on the board ($BODSize$) and for having an independent chairperson on the board who is not the CEO of the entity ($BODDuality$) provide significant odds that a one-unit change in these independent variables will increase the likelihood that an ASX-listed firm will employ an internal audit function (IAF). The percentage change in the odds can be calculated in a similar way as was done in subsection 6.2.1 of this chapter. Referring to the equivalent exponential coefficients in Table 6.2, it is predicted that:

1. A one-unit increase in the number of directors on the board increases the odds that an ASX-listed firm will employ an IAF by 28.0%.
2. The likelihood of having an independent chairperson on the board who is not the CEO during the year ended 2011 increases the odds that an ASX-listed firm will have an IAF by 112.9%.

This outcome suggests that Hypotheses H_{1b2} and H_{1b3} can be accepted. The variable indicating the number of independent directors on the board ($BODIndep$) fails to meet the criteria significance level ($p < 0.05$) for this sample of ASX firms and, therefore, H_{1b1} is rejected. As in the earlier regression shown in Table 6.1 which presented the association of audit committee (AC) effectiveness with the existence of internal audit function (IAF), LogMarCap , a proxy for firm size, explains a significant component of the variation in probabilities following a one-unit increase in its value. This positive influence of the association of firm size with the existence of internal audit function (IAF) is as expected. A

further review of the industry control variables reports that dummy variables of industrials (n=38) (*IndustryIndustrials*) and information technology (n=12) (*IndustryInfoTech*) both have negative beta coefficients. The dummy variable, *IndustryIndustrials*, with an Exp(B) coefficient of 0.283 implies that when comparing industrials firms with materials firms (*IndustryMaterials*, the largest sector), a unit increase in the number of industrials firms will translate into a reduction in odds of 71.7% that an ASX-listed firm will employ an internal audit function (IAF). The Exp (B) of *IndustryInfoTech*, with a value of 0.203, reports that compared to the materials industry, a unit increase in the number of information technology firms will result in a reduction in odds of 79.7% that an ASX-listed firm will employ an internal audit function (IAF). Therefore, the same control variables, with the exception of *IndustryInfoTech*, appear in both regression analyses with regard to the existence of internal audit function (IAF). The result for *IndustrialInfTech* is artifactual, meaning that there is no connection with the existence of internal audit function (IAF). This is an incidental result and not consistently reported in both outcomes. Further analyses of industry variables is reported in Chapter Seven.

The goodness of fit for the logistic regression model meets the requirements in this instance and can be supported from the data provided in Table 6.2, namely:

Estimation fit:

- Between model comparisons (Δ -2LL Value) = 327.878 to 241.790, a decrease of 86.088 (significant improvement in model fit following changed model specifications).
- Pseudo R^2 values, including Cox and Snell's R^2 and Nagelkirke's R^2 values, suggest that the model explains around 30% of the variation in the dependent variable.

Predictive accuracy:

- Hosmer and Lameshow's chi-square-based measure prediction of the dependent variable. In this instance, the variation between classes is non-significant (0.171).
- Hit ratio (classification accuracy) of 74.2%, which shows a high percentage of cases

are correctly classified.

Table 6.2: Logistic Regression Analysis of Existence of Internal Audit and Board of Directors Attributes for Financial Year ended 2011

Variables	n=240		
	Beta Coeff.	Wald Statistic	Exp(B)
Constant	12.795	1.000	2.816
<i>BODIndep</i>	1.110	0.093	3.033
<i>BODSize</i>	0.247	0.004*	1.280
<i>BODDuality</i>	0.756	0.047*	2.129
<i>LogMarCap</i>	1.035	0.000*	2.816
<i>ForgnSubs</i>	-0.630	0.174	0.532
<i>AuditorSpecialist</i>	-0.465	0.179	0.628
<i>IndustryConDis</i>	0.295	0.817	1.343
<i>IndustryConStaples</i>	-1.664	0.337	0.189
<i>IndustryEnergy</i>	0.746	0.571	2.109
<i>IndustryHealthCare</i>	-0.403	0.759	0.668
<i>IndustryIndustrials</i>	-1.738	0.011*	0.283
<i>IndustryInfoTech</i>	-1.725	0.034*	0.203
<i>IndustryTeleCom</i>	-20.142	0.999	0.000
<i>IndustryUtilities</i>	-1.254	0.400	0.285
Goodness-of-Fit Statistics	Value	p-value	
-2 Log-likelihood	241.790	0.000	
Hosmer and Lameshow's X^2	11.588	0.171	
Cox and Snell's R^2	0.301		
Nagelkerke's R^2	0.405		
Pseudo R^2	0.263		
Hit Ratio	74.2%		

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function)

where:

BODIndep = Board of directors' independence; *BODSize* = Board of directors' size; *BODDuality* = Board of directors' duality; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

6.3 Corporate Governance Characteristics and Existence of Internal Audit Outsourcing

This section provides the results of logistic regression used again to examine what independent corporate governance variables (namely, audit committee [AC] and board of directors [BOD]) and internal audit quality (IAQ) variables influenced the likelihood that an ASX-listed firm would employ internal audit outsourcing (IAO). These multivariate logistic

regression results of audit committee (AC) effectiveness are presented separately from the results for board of directors' (BOD) effectiveness in its association with the existence of internal audit outsourcing (IAO). In both regressions, the sample size is limited to 60 with only data from questionnaire responses considered given the status of the information on internal audit outsourcing (IAO). Besides using three attributes of audit committee (AC) and board of directors' (BOD) effectiveness as independent variables, this section also provided multivariate results from examining the association of six internal audit quality characteristics with the existence of internal audit outsourcing, referring to the discussion in Chapter Three, subsection 3.3.2. Owing to the sample size of only 60, a limited number of variables has been used taking into consideration the central limit theory. None of the industry control variables have been used in these regressions with this considered to be a limitation of the current study. Eight different tests were selected for analysis, firstly, with independent variables and, secondly, with each internal audit quality characteristic along with control variables and, finally, with all independent and control variables providing different aspects of association.

6.3.1 Audit committee effectiveness and existence of internal audit outsourcing

Table 6.3 provides the results of logistic regression used to test the hypotheses about the association of audit committee (AC) effectiveness and internal audit quality (IAQ) with the existence of internal audit outsourcing (IAO) (H_{2a1} , H_{2a2} and H_{2a3} ; and H_{2c1} , H_{2c2} , H_{2c3} , H_{2c4} , H_{2c5} and H_{2c6}), referring to Chapter Three, subsection 3.3.2. This logistic regression used a dichotomous variable, namely, existence of internal audit outsourcing (IAO), as the dependent variable and examined its association with three audit committee (AC) effectiveness attributes ($ACIndep$, $ACEExpert$ and $ACMeeting$) and six internal audit quality (IAQ) attributes ($IAQCert$, $IAQExperi$, $IAQSize$, $IAQTrain$, $IAQObject$ and $IAQTimeFin$) as independent variables for a sample size of 60 in the financial year ended 2011. Logistic regression was applied using the same test criteria as was discussed in Section 6.2 above. The results from the logistic regression with selected independent variables are provided in Table 6.3. Due to the limited sample size (n=60) associated with outsourcing, a process of incremental analysis was applied. In total, 12

independent variables were input into the model in stages in a parsimonious fashion, although the last column brings together all tested variables to determine which related factors would be likely or not likely to influence the probability that an ASX-listed firm with an IAF will outsource its internal audit activities. Demographics data for these firms are listed in Chapter Five, Section 5.5 (Table 5.12, Panel B).

The regression equation describing the relationships states:

$$Y_i = X_{1i}\beta + X_{2i}\beta + X_{3i}\beta + \varepsilon \text{ for } i = 1, \dots, n; \quad [13]$$

where:

$$Y = (y_1, \dots, n), X_1 = (x_1, x_2, x_3), X_2 = (x_4, x_5, x_6, x_7, x_8, x_9), X_3 = (x_{10}, x_{11}, x_{12})$$

Y = Dichotomous dependent variable with a value of 0 (IAF not outsourced) or 1 (IAF outsourced)

X_1 = Audit committee factors (3): $ACIndep$, $ACEExpert$ and $ACMeeting$

X_2 = Audit quality factors (6): $IAQCert$, $IAQExperi$, $IAQSize$, $IAQTrain$, $IAQObject$ and $IAQTimeFin$

X_3 = Control variables, limited to one variable from each of three sub-components: size of firm, complexity of operations and use of external audit specialist support.

Columns 1 and 2 suggest that only the coefficient for $ACIndep$ (0.080) is positive and significant (Wald statistic < 0.05) in identifying the relationships that affect the predicted probabilities of internal audit outsourcing (IAO). This AC variable remains consistently significant for all tests including the last omnibus test of all selected variables. The positive Exp (B) score, however, only varies between 5% and 8% indicating that, at best, a one-unit increase in AC independence ($ACIndep$) will result in an 8.4% increase in the odds that ASX-listed firms will outsource their internal audit function (IAF).

None of the quality-based (IAQ) variables appear to significantly influence the likelihood that an ASX-listed firm will outsource its internal audit function (IAF). However, the variable in the omnibus test regarding whether the Chief Audit Executive (CAE) (or their

equivalent) has direct private access to the AC (i.e., *IAQObject*) comes closest to being significant (Wald statistic < 0.1) with a positive logistic coefficient.

In terms of the hypotheses and the results of the model, including all the variables, the following tests are supported:

- H_{2a1} of *ACIndep* (Wald statistic < 0.05) which implies that a one-unit increase in the percentage of the level of AC independence increases the odds by 8.4% that an ASX-listed firm will employ internal audit outsourcing (IAO).

None of the variables of IAQ was significant (only *IAQObject* reported a *p*-value that was close to being significant and therefore warrants mentioning:

- H_{2c5} of *IAQObject* (Wald statistic < 0.1) which implies that the likelihood of the CAE (or their equivalent) reporting to and having direct private access to the AC to maintain objectivity during the year ended 2011 increases the odds by 19.3% that an ASX-listed firm will have internal audit outsourcing.

The rest of the AC and IAQ hypotheses, namely, *ACEExpert* (H_{2a2}), *ACMeeting* (H_{2a3}), *IAQCert* (H_{2c1}), *IAQExperi* (H_{2c2}), *IAQSize* (H_{2c3}), *IAQTrain* (H_{2c4}) and *IAQTimeFin* (H_{2c6}) are not supported as having any significant influence on the existence of internal audit outsourcing (IAO) in ASX-listed firms.

It is reasonable to infer that independence is an issue likely to influence the board decision to outsource its internal audit function (IAF). This is supported by the fact that the higher the proportion of independent AC members and the greater the private access rights of the CAE (or their equivalent) to the AC, the more significant the bearing these have on whether ASX-listed firms outsource their IAF activities. This issue is discussed further in Chapter Eight. Again, the omnibus analysis of variables (Table 6.3, column 7) demonstrates that ASX-listed firms with higher numbers of foreign subsidiaries (signifying complexity) are less likely to outsource part or all of their IAF activities (the logistic coefficient is negative). However, the Exp (B) factor is small (0.050) suggesting that the increase in odds is negative and also rather limited.

The goodness-of-fit results for all regression analyses suggest relatively good and stable models, with the omnibus regression test identifying a significant change in -2 Log-likelihood, consistent R^2 measures approximating 30% of the explanation of variance for the model and a classification ratio of 76.5%.

Table 6.3: Logistic Regression Analysis of Existence of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model excluding control variables			Model including IAQCert			Model including IAQExperi			Model including IAQSize		
	n=60			n=60			n=60			n=60		
	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)
Constant	-3.805	0.157	0.022	-5.967	0.278	0.003	-6.697	0.220	0.001	-5.947	0.273	0.003
<i>ACIndep</i>	0.072	0.018*	1.075	0.054	0.041*	1.056	0.055	0.040*	1.056	0.056	0.038*	1.057
<i>ACEExpert</i>	1.142	0.473	3.133	0.542	0.718	1.720	0.754	0.611	2.125	0.733	0.633	2.080
<i>ACMeeting</i>	-0.078	0.754	0.925	-0.001	0.997	0.999	0.018	0.947	1.018	0.016	0.952	1.016
<i>IAQCert</i>	-0.005	0.781	0.995	-0.005	0.752	0.995						
<i>IAQExperi</i>	-0.038	0.699	0.963				-0.046	0.607	0.955			
<i>IAQSize</i>	-0.004	0.160	0.996							-0.001	0.612	
<i>IAQTrain</i>	0.110	0.649	1.116									0.999
<i>IAQObject</i>	1.103	0.180	1.332									
<i>IAQTimeFin</i>	-0.014	0.593	0.986									
<i>LogMarCap</i>				0.320	0.570	1.377	0.379	0.511	1.461	0.248	0.668	1.282
<i>ForgnSubs</i>				-2.155	0.76	0.116	-2.178	0.060	0.113	-1.980	0.095	0.138
<i>AuditorSpecialist</i>				0.011	0.989	1.011	-0.001	0.999	0.999	0.072	0.929	1.075
Goodness-of-Fit Statistics	Value	p-value		Value	p-value		Value	p-value		Value	p-value	
-2 Log-likelihood	53.510	0.355		53.664	0.201		53.506	0.192		53.511	0.192	
Hosmer and Lameshow's χ^2	11.054	0.199		14.302	0.074		8.995	0.343		5.941	0.654	
Cox and Snell's R^2	0.177			0.175			0.177			0.177		
Nagelkerke's R^2	0.249			0.245			0.249			0.249		
Pseudo R^2	0.156			0.154			0.157			0.156		
Hit Ratio	66.7%			76.5%			74.5%			76.5%		

Table 6.3 (Continued)
Logistic Regression Analysis of Existence of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model including <i>IAQTrain</i>			Model including <i>IAQObject</i>			Model including <i>IAQTimeFin</i>			Model including all variables		
	n=60			n=60			n=60			n=60		
	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)
Constant	-6.534	0.229	0.001	-5.735	0.314	0.003	-6.800	0.209	0.001	-5.134	0.391	0.006
<i>ACIndep</i>	0.055	0.041*	1.056	0.050	0.050*	1.051	0.067	0.027*	1.070	0.080	0.027*	1.084
<i>ACEExpert</i>	0.703	0.641	2.020	1.142	0.463	3.132	0.476	0.759	1.610	1.344	0.458	3.834
<i>ACMeeting</i>	-0.005	0.985	0.995	0.026	0.922	1.026	-0.080	0.772	0.923	-0.021	0.943	0.979
<i>IAQCert</i>										-0.007	0.706	0.993
<i>IAQExperi</i>										-0.056	0.593	0.945
<i>IAQSize</i>										-0.003	0.306	0.997
<i>IAQTrain</i>	0.086	0.721	1.090							0.124	0.634	1.132
<i>IAQObject</i>				1.260	0.128	1.284				1.647	0.089	1.193
<i>IAQTimeFin</i>							-0.027	0.279	0.974	-0.023	0.416	0.978
<i>LogMarCap</i>	0.294	0.605	1.342	0.379	0.527	1.460	0.343	0.544	1.410	0.209	0.747	1.232
<i>ForgnSubs</i>	-2.128	0.068	0.119	-2.602	0.063	0.114	-2.185	0.064	0.112	-2.806	0.043*	0.050
<i>AuditorSpecialist</i>	-0.021	0.979	0.979	-0.008	0.992	0.992	0.000	1.000	1.000	0.388	0.682	1.474
Goodness-of-Fit Statistics	Value	p-value		Value	p-value		Value	p-value		Value	p-value	
-2 Log-likelihood	53.639	0.200		51.190	0.092		52.585	0.145		48.378	0.238	
Hosmer and Lameshow's <i>X</i> ²	5.018	0.714		3.926	0.864		4.786	0.780		8.991	0.343	
Cox and Snell's <i>R</i> ²	0.175			0.214			0.192			0.256		
Nagelkerke's <i>R</i> ²	0.246			0.300			0.270			0.359		
Pseudo <i>R</i> ²	0.155			0.193			0.171			0.237		
Hit Ratio	76.5%			74.5%			74.5%			76.5%		

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAO* (Existence of internal audit outsourcing)

where:

ACIndep = Audit committee independence; *ACEExpert* = Audit committee expertise; *ACMeeting* = Audit committee meetings; *IAQCert* = Internal audit quality certification; *IAQExperi* = Internal audit quality experience; *IAQSize* = Internal audit quality size; *IAQTrain* = Internal audit quality training; *IAQObject* = Internal audit quality objectivity; *IAQTimeFin* = Internal audit quality time spent on financial audits; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist.

6.3.2 Board of directors' effectiveness and existence of internal audit outsourcing

Table 6.4 provides the results of logistic regression used to test the hypotheses about the association of BOD effectiveness and internal audit quality (IAQ) with the existence of internal audit outsourcing (IAO) (H_{2b1} , H_{2b2} and H_{2b3} ; and H_{2c1} , H_{2c2} , H_{2c3} , H_{2c4} , H_{2c5} , H_{2c6} and H_{2c6}), referring to Chapter Three, subsections 3.3.2.2 and 3.3.2.3. This logistic regression used a dichotomous variable, namely, existence of internal audit outsourcing (IAO), as the dependent variable and examined its association with three board of directors' (BOD) effectiveness attributes (*BODIndep*, *BODSize* and *BODMeeting*) and six internal audit quality (IAQ) attributes (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) as independent variables for a sample size of 60 in the financial year ended 2011. The logistic regression has used beta coefficients which may be interpreted in a similar fashion to those provided in OLS regression results. Moreover, due to the dichotomous nature of the dependent variable (IAO), exponentiated logistic coefficients (Exp (B)) have been calculated. The Wald statistic assessed the value of each beta coefficient and, in this instance, a value less than 0.05 indicated that the variable met the criterion for predicting group membership. The results from the logistic regressions with selected independent variables are provided in Table 6.4. Due to the limited sample size associated with outsourcing ($n=60$), a process of incremental analysis was applied. As in subsection 6.3.1 of this chapter, 12 independent variables were input into the model in stages in a parsimonious fashion; however, the last column brings together all tested variables to determine which related variables would be likely to influence the probability that an ASX-listed firm will employ outsourcing partly or fully.

The regression equation describing the relationships states:

$$Y_i = X_1 i \beta + X_2 i \beta + X_3 i \beta + \varepsilon \text{ for } i = 1, \dots, n; \quad [14]$$

where:

$$Y = (y_1, \dots, n), X_1 = (x_1, x_2, x_3), X_2 = (x_4, x_5, x_6, x_7, x_8, x_9), X_3 = (x_{10}, x_{11}, x_{12})$$

Y = Dichotomous dependent variable with a value of 0 (IAF not outsourced) or 1 (IAF outsourced)

X_1 = Board of directors' factors (3): *BODIndep*, *BODSize* and *BODDuality*

X_2 = Audit quality factors (6): *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*

X_3 = Control variables, limited to one variable from each of three sub-components:
size of firm, complexity of operations and use of external audit specialist support.

Table 6.4 suggests that none of the BOD independent variables significantly affects the probabilities that ASX-listed firms will employ internal audit outsourcing (IAO). The only variable that remains consistently significant for all the tests is *BODSize*: with a Wald statistic < 0.1 , this includes the last omnibus test of all selected variables. The positive Exp(B) score indicates that, at best, a one-unit increase in the number of directors on the board during the financial year ended 2011 will increase the odds by 37.8% that an ASX-listed firm will have internal audit outsourcing.

None of the internal audit quality (IAQ) variables appears to significantly influence the likelihood that an ASX-listed firm will outsource its internal audit function (IAF). Therefore, all the BOD hypotheses (H_{2b1} , H_{2b2} and H_{2b3}) and IAQ hypotheses (H_{2c1} , H_{2c2} , H_{2c3} , H_{2c4} , H_{2c5} , H_{2c5} and H_{2c6}) fail to have influence on the outsourcing decision.

A further review of the results shown on Table 6.4 reported that none of the control variables has significant influence on the likelihood that ASX-listed firms will employ internal audit outsourcing (IAO). Foreign subsidiaries (*ForgnSubs*) are close to significant with a Wald statistic < 0.1 . A negative logistic coefficient indicates that firms with a higher number of foreign subsidiaries are less likely to fully or partly outsource their internal audit function (IAF). The Exp (B) is small (0.099) suggesting that the increase in odds is negative.

The goodness-of-fit results for all regressions suggest relatively good and stable models, with the omnibus regression test identifying a significant change in -2 Log-likelihood, consistent R^2 measures approximating 25% of the explanation of variance for the model and a classification ratio of 76.7%.

Table 6.4: Logistic Regression Analysis of Existence of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model excluding control variables			Model including <i>IAQCert</i>			Model including <i>IAQExperi</i>			Model including <i>IAQSize</i>		
	n=60			n=60			n=60			n=60		
	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)
Constant	-2.822	0.306	0.059	-6.476	0.247	0.002	-6.816	0.204	0.001	-7.107	0.203	0.001
<i>BODIndep</i>	1.225	0.336	3.403	1.650	0.202	5.206	1.785	0.175	5.957	1.682	0.193	5.376
<i>BODSize</i>	0.353	0.070	1.424	0.317	0.099	1.373	0.321	0.086	1.379	0.329	0.083	1.390
<i>BODDualty</i>	-0.318	0.960	0.549	-0.383	0.683	0.681	-0.359	0.156	0.698	-0.361	0.688	0.697
<i>IAQCert</i>	0.000	0.991	1.000	-0.002	0.897	0.998						
<i>IAQExperi</i>	-0.007	0.937	0.993				-0.041	0.601				
<i>IAQSize</i>	-0.002	0.447	0.998						0.960	0.001	0.802	
<i>IAQTrain</i>	0.022	0.919	1.022									1.001
<i>IAQObject</i>	0.745	0.359	2.107									
<i>IAQTimeFin</i>	0.006	0.801	1.006									
<i>LogMarCap</i>				0.517	0.321	1.676	0.559	0.292	1.749	0.549	0.308	1.732
<i>ForgnSubs</i>				-2.049	0.071	0.129	-2.100	0.066	0.122	-2.098	0.070	0.123
<i>AuditorSpecialist</i>				0.411	0.587	1.508	0.408	0.589	1.504	0.391	0.608	1.478
Goodness-of-Fit Statistics	Value	p-value		Value	p-value		Value	p-value		Value	p-value	
-2 Log-likelihood	64.331	0.617		61.076	0.164		60.823	0.152		61.029	0.162	
Hosmer and Lameshow's <i>X</i> ²	5.972	0.650		12.595	0.127		5.360	0.719		7.137	0.522	
Cox and Snell's <i>R</i> ²	0.113			0.160			0.163			0.161		
Nagelkerke's <i>R</i> ²	0.162			0.230			0.235			0.231		
Pseudo <i>R</i> ²	0.101			0.146			0.150			0.147		
Hit Ratio	76.7%			76.7%			76.7%			76.7%		

Table 6.4 (Continued)
Logistic Regression Analysis of Existence of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model including <i>IAQTrain</i>			Model including <i>IAQObject</i>			Model including <i>IAQTimeFin</i>			Model including all variables		
	<i>n</i> =60			<i>n</i> =60			<i>n</i> =60			<i>n</i> =60		
	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)
Constant	-6.684	0.212	0.001	-6.759	0.222	0.001	-6.676	0.211	0.001	-6.408	0.296	0.002
<i>BODIndep</i>	1.652	0.203	5.216	1.424	0.283	4.154	1.648	0.202	5.197	1.445	0.292	4.244
<i>BODSize</i>	0.325	0.087	1.384	0.318	0.089	1.374	0.320	0.091	1.377	0.321	0.093	1.378
<i>BODDuality</i>	-0.360	0.692	0.698	-0.259	0.775	0.772	-0.378	0.681	0.685	-0.341	0.728	0.711
<i>IAQCert</i>										-0.001	0.944	0.999
<i>IAQExperi</i>										-0.021	0.809	0.979
<i>IAQSize</i>										0.000	0.946	1.000
<i>IAQTrain</i>	-0.023	0.916	0.977							-0.028	0.906	0.973
<i>IAQObject</i>				0.751	0.322	2.118				0.719	0.408	2.052
<i>IAQTimeFin</i>							-0.003	0.872	0.997	-0.006	0.796	0.994
<i>LogMarCap</i>	0.519	0.323	1.681	0.520	0.327	1.682	0.523	0.319	1.687	0.553	0.347	1.739
<i>ForgnSubs</i>	-2.030	0.071	0.131	-2.243	0.056	0.106	-2.050	0.070	0.129	-2.313	0.063	0.099
<i>AuditorSpecialist</i>	0.413	0.585	1.512	0.398	0.607	1.490	0.405	0.593	1.499	0.387	0.617	1.473
Goodness-of-Fit Statistics	Value	p-value		Value	p-value		Value	p-value		Value	p-value	
-2 Log-likelihood	61.082	0.165		60.055	0.119		61.067	0.164		59.913	0.477	
Hosmer and Lameshow's <i>X</i> ²	10.167	0.253		5.852	0.664		12.628	0.125		4.833	0.775	
Cox and Snell's <i>R</i> ²	0.160			0.174			0.160			0.176		
Nagelkerke's <i>R</i> ²	0.229			0.250			0.230			0.253		
Pseudo <i>R</i> ²	0.146			0.160			0.146			0.162		
Hit Ratio	80.0%			76.7%			78.3%			76.7%		

Notes: *p < 0.05 (Wald statistic); Dependent variable = *IAO* (Existence of internal audit outsourcing)

where:

BODIndep = Board of directors' independence; *BODSize* = Board of directors' size; *BODDuality* = Board of directors' duality; *IAQCert* = Internal audit quality certification; *IAQExperi* = Internal audit quality experience; *IAQSize* = Internal audit quality size; *IAQTrain* = Internal audit quality training; *IAQObject* = Internal audit quality objectivity; *IAQTimeFin* = Internal audit quality time spent on financial audits; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist.

6.4 Corporate Governance Characteristics and Extent of Internal Audit Outsourcing

This section provides the results of OLS regression used to examine what independent corporate governance variables (audit committee [AC] and board of directors [BOD]) and internal audit quality (IAQ) variables influenced the extent of internal audit outsourcing (IAO) of ASX-listed firms for the financial year ended 2011. In this section, basically the same tests are performed using OLS regression instead of logistic regression to examine the extent of outsourcing rather than its mere likelihood of existence. The results of ordinary least squares (OLS) regression examining audit committee (AC) effectiveness are presented separately from the results for the association of board of directors' (BOD) effectiveness with the extent of internal audit outsourcing (*ExtentIAO*). As in Section 6.3 of this chapter, sample size was limited to n=60. All data emanate from the questionnaire responses that provided information about the extent of internal audit outsourcing among respondent ASX-listed firms. Demographic data for these responses are available in Chapter Five, Section 5.5 (Table 5.12, Panel B).

In line with the central limit theory and given the limited sample size of 60, none of the industry control variables has been used in these regressions. Seven parsimonious models were constructed and tested, followed by an omnibus test of all available variables. The omnibus model had a significantly better outcome than the other models, and attention is given to explaining the major significant relationships between variables. In this set of analyses, a confirmatory perspective is adopted wherein an exact set of independent variables is included. This approach is facilitated by the parsimonious models provided in the initial tests which are summarised in the tables provided below. Robustness tests are conducted in Chapter Seven and include possible transformations of variables as necessary. At this point, original continuous values (e.g., extent of outsourcing) are used in the OLS tests.

6.4.1 Audit committee effectiveness and extent of internal audit outsourcing

Table 6.5 provides the results of OLS regression used to test the hypotheses of the association of AC effectiveness and internal audit quality (IAQ) with extent of internal audit outsourcing (IAO) (H_{3a1} , H_{3a2} , H_{3a3} , H_{3c1} , H_{3c2} , H_{3c3} , H_{3c4} , H_{3c5} and H_{3c6}), referring to Chapter Three, subsection 3.3.3. This regression used a continuous variable, namely, extent of internal audit outsourcing (*ExtentIAO*), as the dependent variable and examined its association with three audit committee (AC) effectiveness attributes (*ACIndep*, *ACEExpert* and *ACMeeting*) and six internal audit quality (IAQ) attributes (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) as independent variables for a sample size of 60 in the financial year ended 2011. Ordinary least squares (OLS) regression used *t*-test statistics to assess the level of significance. The results from OLS regression with selected independent variables are provided in Table 6.5. Due to the limited sample size associated with outsourcing (n=60), a process of incremental analysis was applied. In total, 12 independent variables were input into the model in stages in a parsimonious fashion, although the last column brings together all tested variables to determine which related factors would influence an ASX-listed firm to outsource some extent (0–100%) of their internal audit function (IAF).

The regression equation describing the relationship states:

$$Y_i = X_1 i \beta + X_2 i \beta + X_3 i \beta + \varepsilon \text{ for } i = 1, \dots, n; \quad [15]$$

where:

$$Y = (y_1, \dots, n), X_1 = (x_1, x_2, x_3), X_2 = (x_4, x_5, x_6, x_7, x_8, x_9), X_3 = (x_{10}, x_{11}, x_{12})$$

Y = Continuous dependent variable with a value from 0–100%

X₁ = Audit committee factors (3): *ACIndep*, *ACEExpert* and *ACMeeting*

X₂ = Audit quality factors (6): *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*

X₃ = Control variables, limited to one variable from each of three sub-components: size of firm, complexity of operations and use of external audit specialist support.

Columns 1 and 2 suggest that only the coefficient for *ACIndep* (0.332) is positive and significant (*p*-value < 0.05) when identifying the relationships affecting the extent of outsourcing based on the statistical *t*-test. This AC variable remains consistently significant for all the tests, including the last omnibus test of all selected variables.

One internal audit quality variable, that is, *IAQObject*, appears to significantly influence the extent of outsourcing of ASX-listed firms at *p*-value < 0.05 based on the statistical *t*-test. The coefficient for *IAQObject* (0.550) is positive which implies that the likelihood of the CAE (or their equivalent) reporting to and having the opportunity to have direct private access to the AC would result in more internal audit outsourcing. This IAQ variable remains consistently significant for all the tests, including the last omnibus test of all selected variables.

In terms of the hypotheses and the results of the model, including all the variables, the following tests are supported:

- H_{3a1} of *ACIndep* (*p*-value < 0.05) which implies that an increase in the percentage of the level of AC independence will increase the outsourcing extent of ASX-listed firms.
- H_{3c5} of *IAQObject* (*p*-value < 0.05) implies that the likelihood of the CAE (or their equivalent) reporting to and having direct private access to the AC to maintain objectivity would have a positive influence on the extent of internal audit outsourcing (IAO). Therefore, this strong positive association does not support the hypothesis.

It is reasonable to infer that AC independence is an issue likely to influence the audit committee's (AC) decision to outsource its IAF partly or fully. This is supported by the fact that the higher the proportion of independent AC members and the greater the access rights that the CAE (or their equivalent) has to the AC, the more significant the influence on the level of internal audit outsourcing (IAO). This issue is further discussed in Chapter Eight. The rest of the AC and IAQ hypotheses, namely, *ACExpert* (H_{3a2}), *ACMeeting* (H_{3a3}), *IAQCert* (H_{3c1}), *IAQExperi* (H_{3c2}), *IAQSize* (H_{3c3}), *IAQTrain* (H_{3c4}) and *IAQTimeFin* (H_{3c6}) are not supported as having any significant influence on the extent of internal audit outsourcing (IAO) of ASX-listed firms.

A further review of the results shown on Table 6.5 indicated that the omnibus analysis of variables demonstrates that ASX-listed firms with a higher number of foreign subsidiaries (signifying firm complexity) have a significant negative influence on the extent of internal audit outsourcing (IAO) (the OLS coefficient is negative with a p -value < 0.05).

The goodness-of-fit results for all regressions suggest good and stable models with the adjusted R^2 of the omnibus regression test having the highest (43.5%) value with a significant p -value < 0.05 level based on F -statistics.

Table 6.5: OLS Regression Analysis of Extent of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model excluding control variables		Model including <i>IAQCert</i>		Model including <i>IAQExperi</i>		Model including <i>IAQSize</i>	
	n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	-32.749	0.395	-38.092	0.606	-40.991	0.576	-59.664	0.417
<i>ACIndep</i>	0.350	0.015*	0.459	0.003*	0.447	0.003*	0.417	0.006*
<i>ACExpert</i>	-0.003	0.978	0.121	0.402	0.117	0.417	0.127	0.371
<i>ACMeeting</i>	-0.011	0.933	0.019	0.895	0.018	0.904	0.008	0.956
<i>IAQCert</i>	0.080	0.515	-0.041	0.762				
<i>IAQExperi</i>	0.089	0.469			0.021	0.881		
<i>IAQSize</i>	0.038	0.783					0.162	0.266
<i>IAQTrain</i>	-0.110	0.363						
<i>IAQObject</i>	0.515	0.000*						
<i>IAQTimeFin</i>	-0.087	0.520						
<i>LogMarCap</i>			-0.077	0.597	-0.081	0.588	-0.032	0.828
<i>ForgnSubs</i>			-0.216	0.109	-0.212	0.117	-0.252	0.067
<i>AuditorSpecialist</i>			-0.219	0.118	-0.210	0.130	-0.187	0.176
F-statistics (p-value)	3.932	0.001	2.371	0.038	2.357	0.039	2.603	0.025
Adjusted <i>R</i> ²	0.155		0.161		0.160		0.183	

Table 6.5 (Continued)
OLS Regression Analysis of Extent of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model including <i>IAQTrain</i>		Model including <i>IAQObject</i>		Model including <i>IAQTimeFin</i>		Model including all variables	
	n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	-38.794	0.593	3.094	0.957	-44.968	0.539	-5.623	0.931
<i>ACIndep</i>	0.433	0.004*	0.360	0.003*	0.470	0.004*	0.332	0.018*
<i>ACExpert</i>	0.120	0.401	-0.013	0.908	0.119	0.408	0.008	0.948
<i>ACMeeting</i>	0.036	0.808	0.055	0.636	0.007	0.963	0.042	0.744
<i>IAQCert</i>							0.059	0.620
<i>IAQExperi</i>							0.072	0.541
<i>IAQSize</i>							0.070	0.611
<i>IAQTrain</i>	-0.091	0.496					-0.119	0.300
<i>IAQObject</i>			0.552	0.000*			0.550	0.000*
<i>IAQTimeFin</i>					-0.049	0.740	-0.073	0.567
<i>LogMarCap</i>	-0.061	0.678	-0.42	0.714	-0.074	0.611	-0.017	0.898
<i>ForgnSubs</i>	-0.218	0.104	-0.318	0.105	-0.212	0.116	-0.326	0.006*
<i>AuditorSpecialist</i>	-0.214	0.119	-0.145	0.185	-0.211	0.127	-0.118	0.320
F-statistics (p-value)	2.445	0.033	7.512	0.000	2.374	0.038	4.205	0.000
Adjusted R ²	0.168		0.477		0.161		0.435	

Notes: *p < 0.05

Dependent variable = *ExtentIAO* (Extent of internal audit outsourcing)

where:

ACIndep = Audit committee independence; *ACExpert* = Audit committee expertise; *ACMeeting* = Audit committee meetings; *IAQCert* = Internal audit quality certification; *IAQExperi* = Internal audit quality experience; *IAQSize* = Internal audit quality size; *IAQTrain* = Internal audit quality training; *IAQObject* = Internal audit quality objectivity; *IAQTimeFin* = Internal audit quality time spent on financial audits; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist.

6.4.2 Board of directors' effectiveness and extent of internal audit outsourcing

Table 6.6 provides the results of OLS regression used to test the hypotheses in relation to the association of BOD effectiveness and internal audit quality (IAQ) with the extent of internal audit outsourcing (IAO) (H_{3b1} , H_{3b2} , H_{3b3} , H_{3c1} , H_{3c2} , H_{3c3} , H_{3c4} , H_{3c5} and H_{3c6}), referring to Chapter Three, subsection 3.3.3. This regression used a continuous variable, namely, the extent of internal audit outsourcing (*ExtentIAO*), as the dependent variable and examined its association with three board of director (BOD) effectiveness attributes (*BODIndep*, *BODSize* and *BODDuality*) and six internal audit quality (IAQ) attributes (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) as independent variables for a sample size of 60 in the financial year ended 2011. Ordinary least squares (OLS) regression was used with *t*-test statistics to assess the level of significance at 0.05 level; based on the statistical *t*-test, the relationships affecting the extent of internal audit outsourcing (IAO) were identified. The results from the OLS regression with selected independent variables are provided in Table 6.6. Due to the limited sample size associated with outsourcing (n=60), a process of incremental analysis was applied. In total, 12 independent variables were input into the model in stages in a parsimonious fashion; however, the last column brings together all tested variables to determine which related factors would influence an ASX-listed firm to outsource some extent (0–100%) of their internal audit function (IAF).

The regression equation describing the relationship states:

$$Y_i = X_1 i \beta + X_2 i \beta + X_3 i \beta + \varepsilon \text{ for } i = 1, \dots, n; \quad [16]$$

where:

$$Y = (y_1, \dots, n), X_1 = (x_1, x_2, x_3), X_2 = (x_4, x_5, x_6, x_7, x_8, x_9), X_3 = (x_{10}, x_{11}, x_{12})$$

Y = Continuous dependent variable with a value from 0–100%

X_1 = Board of director factors (3): *BODIndep*, *BODSize* and *BODDuality*

X_2 = Audit quality factors (6): *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*

X_3 = Control variables, limited to one variable from each of three sub-components:
size of firm, complexity of operations and use of external audit specialist support.

In Table 6.6, columns 1 and 2 suggest, at a p -value < 0.05 based on the statistical t -test, that none of the BOD variables significantly influenced the ASX-listed firms to undertake some extent of internal audit outsourcing (IAO).

Among the six IAQ variables, one variable, *IAQObject*, has a significant positive influence on the extent of internal audit outsourcing (IAO) at a p -value < 0.05 based on the statistical t -test. The ordinary least squares (OLS) regression coefficient of *IAQObject* is 0.595 which implies that the likelihood of the CAE (or their equivalent) having direct private access to the AC would result in a greater extent of outsourcing. This IAQ variable remains consistently significant for all the tests, including the last omnibus test of all selected variables.

In terms of the hypotheses and the results of the model, including all the variables, Hypothesis H_{3c5} is not supported. Hypothesis H_{3c5} of *IAQObject* (p -value < 0.05) implies that the likelihood of the CAE (or their equivalent) reporting to the AC to maintain reporting objectivity would have a positive influence on the extent of outsourcing.

It is reasonable to infer that the objectivity of internal auditors with greater access to the CAE (or their equivalent) is an issue of IAQ that is likely to influence the level of outsourcing of the internal audit function (IAF). None of the rest of the IAQ variables and the BOD variables received support as having a significant influence on the extent of outsourcing.

A further review of results shown on Table 6.6 indicates that the omnibus analyses of the variables of ASX-listed firms with a higher number of foreign subsidiaries (signifying firm complexity), at a p -value < 0.05 , have a significant negative influence on the extent of internal audit outsourcing (IAO).

The goodness-of-fit for all regressions suggests relatively stable and good models with the adjusted R^2 of the omnibus regression test having the highest (38.0%) value with a significant p -value < 0.05 level based on F -statistics.

Table 6.6: OLS Regression Analysis of Extent of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model excluding control variables		Model including <i>IAQCert</i>		Model including <i>IAQExperi</i>		Model including <i>IAQSize</i>	
	n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	19.526	0.549	0.344	0.996	8.312	0.907	-2.355	0.555
<i>BODIndep</i>	-0.042	0.726	0.108	0.422	0.112	0.416	0.133	0.304
<i>BODSize</i>	0.102	0.384	-0.020	0.892	-0.028	0.845	0.020	0.886
<i>BODDualty</i>	0.087	0.474	0.187	0.183	0.203	0.140	0.218	0.097
<i>IAQCert</i>	0.142	0.238	0.061	0.655				
<i>IAQExperi</i>	0.156	0.194			-0.015	0.913		
<i>IAQSize</i>	0.093	0.461					0.303	0.063
<i>IAQTrain</i>	-0.133	0.248						
<i>IAQObject</i>	0.570	0.000*						
<i>IAQTimeFin</i>	0.022	0.855						
<i>LogMarCap</i>			0.024	0.855	0.029	0.833	0.105	0.433
<i>ForgnSubs</i>			-0.231	0.094	-0.236	0.087	-0.298	0.072
<i>AuditorSpecialist</i>			-0.122	0.377	-0.127	0.359	-0.102	0.439
F-statistics (p-value)	3.607	0.002	1.045	0.412	1.014	0.433	1.824	0.102
Adjusted R ²	0.003		0.005		0.002		0.089	

Table 6.6 (Continued)
OLS Regression Analysis of Extent of Internal Audit Outsourcing for Financial Year ended 2011

Variables	Model including <i>IAQTrain</i>		Model including <i>IAQObject</i>		Model including <i>IAQTimeFin</i>		Model including all variables	
	n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	10.052	0.886	69.941	0.228	9.713	0.891	26.904	0.681
<i>BODIndep</i>	0.103	0.443	-0.018	0.870	0.116	0.389	0.042	0.714
<i>BODSize</i>	-0.008	0.957	-0.020	0.861	-0.015	0.916	0.045	0.707
<i>BODDuality</i>	0.215	0.116	0.126	0.251	0.185	0.181	0.120	0.294
<i>IAQCert</i>							0.131	0.243
<i>IAQExperi</i>							0.146	0.199
<i>IAQSize</i>							0.173	0.179
<i>IAQTrain</i>	-0.137	0.304					-0.162	0.144
<i>IAQObject</i>			0.603	0.000*			0.595	0.000*
<i>IAQTimeFin</i>					0.097	0.478	-0.030	0.799
<i>LogMarCap</i>	0.046	0.732	-0.007	0.950	0.011	0.935	0.038	0.747
<i>ForgnSubs</i>	-0.238	0.081	-0.331	0.004*	-0.229	0.095	-0.355	0.002*
<i>AuditorSpecialist</i>	-0.135	0.326	-0.070	0.526	-0.129	0.348	-0.051	0.641
F-statistics (p-value)	1.187	0.327	5.888	0.000	1.095	0.380	4.014	0.000
Adjusted R ²	0.022		0.367		0.011		0.380	

Notes: *p < 0.05

Dependent variable = *ExtentIAO* (Extent of internal audit outsourcing)

where:

BODIndep = Board of directors' independence; *BODSize* = Board of directors' size; *BODDuality* = Board of directors' duality; *IAQCert* = Internal audit quality certification; *IAQExperi* = Internal audit quality experience; *IAQSize* = Internal audit quality size; *IAQTrain* = Internal audit quality training; *IAQObject* = Internal audit quality objectivity; *IAQTimeFin* = Internal audit quality time spent on financial audits; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist.

6.5 Existence of Internal Audit Function and Discretionary Accruals

This section provides the results of the multivariate OLS regression used to examine the association of the existence of internal audit function (*IAF*) with discretionary accruals (*DAC*) for the financial year ended 2011. As in earlier tests (e.g., in Section 6.2 of this chapter), a sample size of 240 ASX-listed firms was included, combining questionnaire (primary) data and annual financial report (secondary) data.

As discussed in Chapter Two, subsection 2.8.1, discretionary accruals are viewed as an appropriate proxy for moral business behaviour. It is argued that the less such behaviour is undertaken, the less likely companies will be to attempt to disguise real earnings in order to mislead users of their financial statements. A major contention of this research is that an effective and proactive internal audit function (*IAF*) will directly assist the audit committee (AC) and, indirectly, the external audit in helping to ensure that financial results are properly and fairly reported. It was anticipated that the following regression tests would support this contention as the results would show that the existence of an *IAF* would positively influence the extent to which ASX-listed firms undertook earnings management, in the form of their use of discretionary accruals.

The results of the OLS regression used to test the hypothesis in relation to the association of the existence of the internal audit function with discretionary accruals (H_4) is presented in this section, referring to Chapter Three, subsection 3.3.4. This OLS regression used a dichotomous variable, that is, existence of internal audit function (*IAF*), as an independent variable and examined its association with discretionary accruals (*DAC*), the dependent variable, for a sample size of 240 ASX-listed firms. Following the direct specification of the relevant independent variables (including control variables), a stable regression outcome was achieved ($F = 2.42, 0.003$). The results in columns 1 and 2 suggest that the beta coefficient of *IAF* (-0.064) is negative but insignificant at the 0.05 level of significance. This implies that the existence of the internal audit function (*IAF*) does not significantly influence the practice of discretionary accruals; therefore,

Hypothesis H₄ can be rejected. This outcome applies in relation to all 240 firms included in the analysis.

As expected, selected control variables displayed effects of varying significance on the level of discretionary accruals (DAC). Table 6.7, columns 1 and 2 indicates that the OLS coefficient of *SQRTLev* (0.201) is positive and statistically significant at a *p*-value < 0.05. Moreover, the coefficient of *ForgnSubs* (-0.210) and *AuditorSpecialist* (-0.230) are both negative and statistically significant at a *p*-value < 0.05. In relation to the industry control variables examined in this study, consumer discretionary (*IndustryConDis*), consumer staples (*IndustryConStaples*) and materials (*IndustryMaterials*) industry sectors have positive coefficients with a significant relationship (*p*-value < 0.05). These significant factors help to explain only 10.5% (adjusted *R*²) of the variation in the dependent variable. In Chapter Seven, additional sensitivity tests are conducted in relation to these major industry sectors (i.e., materials, industrials and consumer discretionary) which display a positive relationship with discretionary accruals.

Table 6.7: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011

Variables	n=240	
	Beta Coeff.	<i>p</i> -value
Constant	-2.404	0.061
<i>IAF</i>	-0.064	0.426
<i>ACEExpert</i>	-0.109	0.143
<i>LogMarCap</i>	0.137	0.090
<i>SQRTLev</i>	0.201	0.012*
<i>ForgnSubs</i>	-0.210	0.005*
<i>AuditorSpecialist</i>	-0.230	0.004*
<i>IndustryConDis</i>	0.294	0.011*
<i>IndustryConStaples</i>	0.187	0.033 *
<i>IndustryEnergy</i>	0.204	0.065
<i>IndustryHealthCare</i>	0.150	0.094
<i>IndustryIndustrials</i>	0.183	0.106
<i>IndustryInfoTech</i>	0.047	0.577
<i>IndustryTeleCom</i>	0.017	0.824
<i>IndustryUtilities</i>	0.035	0.673
<i>F</i> -statistics (<i>p</i> -value)	2.420	0.003
Adjusted <i>R</i> ²		0.105

Notes: **p* < 0.05

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

6.6 Existence of Internal Audit Outsourcing and Discretionary Accruals

This section follows on from the above contention that the existence of an IAF influenced the degree to which ASX-listed firms practised the use of discretionary accruals (*DAC*). In Chapter Three, subsection 3.3.5, it was determined that a number of factors influenced whether or not respondent firms outsourced part or all of their internal audit function (IAF). All of these factors, including enhancing the management of internal control, are concerned with enabling firms to better achieve their strategic objectives. Outsourcing therefore represents an incremental improvement on the services and quality of the internal audit function (IAF) and will in itself (i.e., in its existence and the extent of its use) add value to the function. The motivation for the belief that such activities may limit the practice of using discretionary accruals in ASX-listed firms thus arises.

The results reported in this section are from the multivariate OLS regression which examined the association of the existence of internal audit outsourcing (*IAO*) with discretionary accruals (*DAC*) for the financial year ended 2011. As in subsections 6.3.1 and 6.3.2 earlier in this chapter, the size of the sample was limited to 60 firms. Here, the data were analysed from the questionnaire responses relating to the existence of internal audit outsourcing. In addition to using existence of internal audit outsourcing (*IAO*) as an independent dichotomous variable, the multivariate results examined the association of six internal audit quality characteristics with discretionary accruals (*DAC*). The following tests relate to the hypotheses on the association of the existence of internal audit outsourcing (*IAO*) and internal audit quality (*IAQ*) with discretionary accruals (*DAC*) (H_5 and H_{7a} , H_{7b} , H_{7c} , H_{7d} , H_{7e} and H_{7f}). In line with the central limit theory and given the

sample size of 60, none of the industry control variables has been used in these regressions. Eight different tests were selected for analysis, firstly, with independent variables and, secondly, with each internal audit quality characteristic along with control variables and, finally, with all independent and control variables providing different aspects of association.

Table 6.8 provides the results of the OLS regression tests for Hypotheses H₅, H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f}, referring to Chapter Three, subsection 3.3.5. All regression tests used discretionary accruals (*DAC*) as a continuous dependent variable and examined its association with the existence of internal audit outsourcing (*IAO*) and six internal audit quality (*IAQ*) attributes (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) as independent variables for a sample size of 60 ASX-listed firms. The test results summarised in Table 6.8 are necessarily parsimonious, given the limited sample size (60); however, key variables have been specified for retesting within the eight variations. Regression results reported in columns 1 and 2 (independent variables only) and columns 15 and 16 (the omnibus test) emanated from unstable models and the outcomes cannot be evaluated. In the remaining restricted tests, as the regression models were stable, they explained over 20% of the variation in the dependent variable (*DAC*). None of the seven independent variables (i.e., existence of outsourcing and quality of internal audit function) met the significance requirements ($p < 0.05$), indicating that all of Hypotheses H₅, H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} were rejected. The quality of internal audit is further examined for sensitivity with the results reported in Chapter Seven.

Two control variables consistently featured as factors influencing the incidence of earnings management. These variables, namely *SQRTLev* and *AuditorSpecialist*, provided significant contributions towards explaining the overall relationships and were also reported as significant factors influencing discretionary accruals (*DAC*) in Section 6.5 above.

Table 6.8: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011

Variables	Model excluding control variables		Model including IAQCert		Model including IAQExperi		Model including IAQSize		Model including IAQTrain		Model including IAQObject		Model including IAQTimeFin		Model including all variables	
	n=60		n=60		n=60		n=60		n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	0.478	0.702	-4.132	0.138	-4.240	0.100	-4.294	0.109	-4.208	0.110	-4.259	0.106	-4.406	0.093	-4.776	0.130
IAO	-0.133	0.393	-0.202	0.145	-0.220	0.113	-0.201	0.146	-0.202	0.146	-0.199	0.157	-0.205	0.139	-0.214	0.153
IAQCert	0.017	0.913	-0.009	0.946											0.004	0.977
IAQExperi	-0.021	0.895			-0.134	0.332									-0.135	0.366
IAQSize	-0.007	0.696					0.022	0.872							0.040	0.804
IAQTrain	0.050	0.749							0.004	0.977					-0.014	0.924
IAQObject	-0.085	0.597									0.022	0.868			0.045	0.765
IAQTimeFin	-0.104	0.514											-0.090	0.526	-0.104	0.510
ACEExpert			0.095	0.495	0.061	0.669	0.093	0.507	0.095	0.496	0.100	0.483	0.108	0.442	0.081	0.601
LogMarCap			0.207	0.129	0.240	0.085	0.212	0.130	0.207	0.130	0.207	0.129	0.223	0.107	0.269	0.088
SQRTLev			0.304	0.033*	0.323	0.023*	0.304	0.032*	0.305	0.031*	0.306	0.031*	0.292	0.040*	0.308	0.044*
ForgnSubs			-0.144	0.278	-0.125	0.345	-0.147	0.273	-0.143	0.311	-0.144	0.277	-0.117	0.400	-0.104	0.503
Auditor Specialist			-0.316	0.023*	-0.326	0.016*	-0.312	0.022*	-0.314	0.021*	-0.317	0.021*	-0.311	0.022*	-0.326	0.030*
F-statistics (p-value)	0.228	0.976	2.783	0.018	2.984	0.013	2.787	0.018	2.782	0.018	2.788	0.018	2.868	0.016	1.594	0.137
Adjusted R ²	-0.121		0.206		0.224		0.207		0.206		0.207		0.214		0.129	

Notes: *p < 0.05

Dependent variable = DAC (Discretionary accruals)

where:

IAO = Existence of internal audit outsourcing; IAQCert = Internal audit quality certification; IAQExperi = Internal audit quality experience; IAQSize = Internal audit quality size; IAQTrain = Internal audit quality training; IAQObject = Internal audit quality objectivity; IAQTimeFin = Internal audit quality time spent on financial audits; ACEExpert = Audit committee expertise; LogMarCap = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; SQRTLev = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; ForgnSubs = Number of foreign subsidiaries divided by total number of subsidiaries; AuditorSpecialist = External auditor specialist.

6.7 Extent of Internal Audit Outsourcing and Discretionary Accruals

This section reports the results of the regression test in which internal audit outsourcing was measured as a continuous scale variable, namely, ‘extent of internal audit outsourcing’ with a range from 0–100%. Figure 6.1 below demonstrates the scale range of the extent of outsourcing for the 60 firms that responded to this section of the research questionnaire. The vast majority of firms reported that they did not outsource any part of their internal audit function (IAF), producing a strongly positive skew to the distribution. The results of this version of the regressions, using the same independent variables that were included in Section 6.6, are summarised in Table 6.9. Again, sensitivity tests with respect to normality issues for the dependent variable and for internal audit quality (IAQ) variables are reported in Chapter Seven.

The results reported in this section are from the multivariate OLS regression which examined the association of the extent of internal audit outsourcing with discretionary accruals for the financial year ended 2011. As in Sections 6.3 and 6.4 earlier in this chapter, the size of the sample was limited to 60. Here, only data from the questionnaire responses on the extent of internal audit outsourcing have been considered. In addition to using extent of internal audit outsourcing (*ExtentIAO*) as the independent continuous variable, the multivariate results examined the association of six internal audit quality (IAQ) characteristics with discretionary accruals (DAC). These tests relate to the hypotheses on the association of the extent of internal audit outsourcing (IAO) and internal audit quality (IAQ) with discretionary accruals (DAC) (H_6 , H_{7a} , H_{7b} , H_{7c} , H_{7d} , H_{7e} and H_{7f}). In line with the central limit theory and given the sample size of 60, none of the industry control variables was used in these regressions. Eight different tests were selected for analysis, firstly, with independent variables and, secondly, with each internal audit quality characteristic along with control variables and, finally, with all independent and control variables providing different aspects of association.

Table 6.9 provides the results of the OLS regression used to test Hypotheses H_6 , H_{7a} , H_{7b} , H_{7c} , H_{7d} , H_{7e} and H_{7f} , referring to Chapter Three, subsection 3.3.6. This regression used

the continuous variable, namely, discretionary accruals (*DAC*), as the dependent variable and examined its association with the extent of internal audit outsourcing (*ExtentIAO*) and six internal audit quality (IAQ) attributes (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) as independent variables for a sample size of 60 ASX-listed firms. The test results summarised in Table 6.9 are necessarily parsimonious, given the limited sample size (60); however, key variables have been specified for retesting within the eight variations. The OLS regression results reported in columns 1 and 2 (independent variable only and omnibus test) emanated from unstable models and outcomes cannot be evaluated. In the remaining restricted tests, the regression models were stable and explained over 18% of the variation in the dependent variable, discretionary accruals (*DAC*). None of the seven independent variables (i.e., extent of internal audit outsourcing and quality of internal audit function) met the significance requirements ($p < 0.05$), indicating that all of Hypotheses H₆, H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} were rejected. The quality of internal audit is further examined for sensitivity and the results are reported in Chapter Seven.

As in the earlier analyses in Section 6.6 of this chapter, two control variables (*SQRTLev* and *AuditorSpecialist*) consistently featured as influencing the incidence of earnings management. These variables provided significant contributions towards explaining the overall relationships and were also reported as significant factors influencing *DAC* in Sections 6.5 and 6.6 above. Therefore, the findings of this analysis were not significantly different from the findings reported above for the existence of internal audit outsourcing.

Table 6.9: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011

Variables	Model excluding control variables		Model including IAQCert		Model including IAQExperi		Model including IAQSize		Model including IAQTrain		Model including IAQObject		Model including IAQTimeFin		Model including all variables	
	n=60		n=60		n=60		n=60		n=60		n=60		n=60		n=60	
	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value	Beta Coeff.	p-value
Constant	0.321	0.795	-4.069	0.148	-4.087	0.119	-4.311	0.111	-3.994	0.133	-3.936	0.142	-4.226	0.111	-4.679	0.145
ExtentIAO	-0.105	0.583	-0.150	0.275	-0.146	0.285	-0.162	0.247	-0.152	0.269	-0.171	0.291	-0.145	0.290	-0.164	0.351
IAQCert	0.031	0.848	0.002	0.990											0.027	0.857
IAQExperi	-0.007	0.966			-0.098	0.481									-0.088	0.562
IAQSize	0.022	0.894					0.059	0.672							0.073	0.654
IAQTrain	0.033	0.835							-0.025	0.857					-0.050	0.742
IAQObject	-0.114	0.547									-0.039	0.808			-0.007	0.966
IAQTimeFin	-0.106	0.508											-0.072	0.616	-0.100	0.532
ACEExpert			0.147	0.293	0.124	0.383	0.141	0.312	0.147	0.291	0.142	0.315	0.157	0.264	0.134	0.382
LogMarCap			0.177	0.193	0.200	0.152	0.191	0.172	0.179	0.189	0.177	0.193	0.190	0.170	0.236	0.135
SQRTLev			0.280	0.049*	0.288	0.040*	0.279	0.046*	0.281	0.045*	0.280	0.046*	0.268	0.046*	0.279	0.048*
ForgnSubs			-0.148	0.270	-0.137	0.308	-0.154	0.254	-0.156	0.270	-0.145	0.282	-0.128	0.363	-0.131	0.401
Auditor Specialist			-0.339	0.017*	-0.348	0.013*	-0.336	0.016*	-0.339	0.015*	-0.336	0.016*	-0.336	0.016*	-0.333	0.029*
F-statistics (p-value)	0.164	0.991	2.587	0.026	2.691	0.022	2.625	0.025	2.594	0.026	2.600	0.026	2.640	0.024	1.445	0.191
Adjusted R ²	-0.132		0.188		0.198		0.192		0.189		0.189		0.193		0.100	

Notes: *p < 0.05; Dependent variable = DAC (Discretionary accruals)

where:

ExtentIAO = Extent of internal audit outsourcing; IAQCert = Internal audit quality certification; IAQExperi = Internal audit quality experience; IAQSize = Internal audit quality size; IAQTrain = Internal audit quality training; IAQObject = Internal audit quality objectivity; IAQTimeFin = Internal audit quality time spent on financial audits; ACEExpert = Audit committee expertise; LogMarCap = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; SQRTLev = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; Forgnsubs = Number of foreign subsidiaries divided by total number of subsidiaries; AuditorSpecialist = External auditor specialist.

6.8 Summary of the Chapter

This chapter has reported the empirical results of this study. Firstly, the chapter presented multivariate results analysing the association of two corporate governance characteristics with the internal audit function (IAF), and the existence and extent of internal audit outsourcing (IAO). Later, multivariate results were used to examine the association of the existence of the internal audit function (IAF) and the existence and extent of internal audit outsourcing (IAO) with discretionary accruals (DAC). A summary of all the tested hypotheses results is provided in Appendix B for more information. These are discussed in detail in Chapter Eight.

Chapter Seven discusses the results of robustness and sensitivity analyses conducted in addition to the multivariate analyses in Chapter Six. Specifically, the robustness and sensitivity analyses provide different insights into the association of audit committee (AC) effectiveness and board of directors' (BOD) effectiveness with the variables *IAF*, *IAO* and *ExtentIAO*. In addition, different measures of discretionary accruals (DAC) were used to analyse its association with the variables, *IAF*, *IAO* and *ExtentIAO*. It was considered that these analyses could result in some modification of test results depending on the findings.

Chapter Seven: Sensitivity and Robustness Analysis

7.1 Overview of the Chapter

Chapter Six discussed the main empirical results of this study. The results of logistic regressions reported the association of two important corporate governance mechanisms (audit committee [AC] and board of directors' [BOD] effectiveness) with the existence of the internal audit function (IAF) and internal audit outsourcing (IAO) of ASX-listed firms. This was followed by OLS regression results that presented the association of two corporate governance mechanisms with the extent of internal audit outsourcing (IAO). Subsequently, Chapter Six presented the results of multivariate OLS regression to test the association of the existence of the internal audit function (IAF) and the existence and extent of internal audit outsourcing (IAO) with discretionary accruals (DAC) which was used as a proxy for measuring earnings management and, in general, the reporting ethicality of ASX-listed firms.

Chapter Seven outlines the sensitivity and robustness analyses used to check the stability of the main results represented in Chapter Six. The beginning of the chapter reports on the use of an alternative measure of the dependent variable, discretionary accruals (*DAC*), to examine the durability of the main results. This was followed by alternative measures of all the explanatory variables, that is, attributes of audit committee (AC) and board of directors' (BOD) effectiveness and internal audit quality (IAQ) and control variables were used and re-run in the respective logistic and OLS regressions to test whether the variables used in the main analysis were relatively stable. Another continuous dependent variable, *ExtentIAO*, using dummy values of 1 for those with an extent of 1–100% of outsourcing and 0 for 0% of outsourcing, has already been examined in Hypotheses H_{2a} and H_{2b}. Therefore, *ExtentIAO* has not been further assessed. This chapter later reports that firms in the sample were partitioned based on firm size, risk, complexity, auditor firm quality and industry, and the main regressions were re-run to test whether the results were influenced by these firm characteristics. Finally, the sample was partitioned by the presence or absence of the internal audit function (IAF) which influences the results of the related regressions.

7.2 Alternative Measure of Discretionary Accruals

This section discusses the sensitivity of the main results with an alternative measure of the continuous dependent variable, discretionary accruals (*DAC*), in Hypotheses H₄, H₅ and H₆ and H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} used to examine the association of the existence of the internal audit function (*IAF*), existence of internal audit outsourcing (*IAO*), extent of internal audit outsourcing (*ExtentIAO*) and internal audit quality (*IAQ*) with discretionary accruals (*DAC*). This study used the modified Jones model, one of the most widely used constructs to measure discretionary accruals (*DAC*) in the main analysis discussed in Chapter Four, subsection 4.4.4, which partitions total accruals into discretionary and non-discretionary components (Dechow, R. Sloan and A. Sweeney 1995). However, Kothari, Leone and Wasley (2005) later argued that discretionary accruals (*DAC*), measured by following the Jones and modified Jones models, might fail to capture model specification for firms in the sample with extreme financial performance that would be more likely to engage in earnings management. To overcome the problem of low power and model misspecification, it is important to control for firm financial performance (Dechow, Sloan and Sweeney 1995). Kothari, Leone and Wasley (2005) therefore introduced the performance-matched modified Jones model (PMMJM) to control for firm performance-related misspecification, on the basis of the firm's return on assets (ROA) and industry membership. Consistent with the earlier studies (Xie, Davidson and DaDalt 2003; Prawitt, Smith and Wood 2009; Sun and Liu 2012; Sun et al. 2010), this study used the performance-matched modified Jones model (Kothari, Leone and Wasley 2005) as an alternative measure of discretionary accruals (*DAC*) to control for the firm's financial performance and to solve model misspecification and the test of power. The performance-matched modified Jones model (PMMJM) was used to analyse the association of the existence of the internal audit function (*IAF*), and the existence and extent of internal audit outsourcing (*IAO*) with discretionary accruals (*DAC*) in Hypotheses H₄, H₅ and H₆, respectively, along with H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f}. Table 7.1 shows the OLS regression

results of H₄, H₅ and H₆; and H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} using the performance-matched modified Jones model (PMMJM).

Table 7.1: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011

Regression results of <i>IAF</i> with <i>DAC</i>			Regression results of <i>IAO</i> and <i>IAQ</i> attributes with <i>DAC</i>			Regression results of <i>ExtentIAO</i> and <i>IAQ</i> attributes with <i>DAC</i>		
Variables	n=240		Variables	n=60		Variables	n=60	
	Beta Coeff.	p-value		Beta Coeff.	p-value		Beta Coeff.	p-value
Constant	-0.448	0.723	Constant	-2.585	0.357	Constant	-2.714	0.329
<i>IAF</i>	-0.084	0.298	<i>IAO</i>	-0.078	0.597	<i>ExtentIAO</i>	-0.175	0.307
<i>ACEExpert</i>	-0.104	0.179	<i>IAQCert</i>	-0.018	0.901	<i>IAQCert</i>	0.003	0.981
<i>LogMarCap</i>	0.053	0.516	<i>IAQExperi</i>	-0.085	0.558	<i>IAQExperi</i>	-0.074	0.607
<i>SQRTLev</i>	0.078	0.339	<i>IAQSize</i>	0.0109	0.487	<i>IAQSize</i>	0.135	0.386
<i>ForgnSubs</i>	-0.193	0.070	<i>IAQTrain</i>	0.088	0.544	<i>IAQTrain</i>	0.051	0.725
<i>AuditorSpecialist</i>	-0.182	0.026*	<i>IAQObject</i>	0.155	0.310	<i>IAQObject</i>	0.082	0.633
<i>IndustryConDis</i>	-0.017	0.845	<i>IAQTimeFin</i>	-0.109	0.485	<i>IAQTimeFin</i>	-0.111	0.473
<i>IndustryConStaples</i>	0.061	0.450	<i>ACEExpert</i>	0.107	0.463	<i>ACEExpert</i>	0.113	0.432
<i>IndustryEnergy</i>	-0.029	0.738	<i>LogMarCap</i>	0.148	0.318	<i>LogMarCap</i>	0.161	0.276
<i>IndustryHealthCare</i>	-0.003	0.970	<i>SQRTLev</i>	0.132	0.375	<i>SQRTLev</i>	0.144	0.327
<i>IndustryIndustrials</i>	-0.119	0.189	<i>ForgnSubs</i>	0.030	0.848	<i>ForgnSubs</i>	0.019	0.896
<i>IndustryInfoTech</i>	-0.169	0.040*	<i>AuditorSpecialist</i>	-0.350	0.020*	<i>AuditorSpecialist</i>	-0.349	0.019*
<i>IndustryTeleCom</i>	-0.053	0.487						
<i>IndustryUtilities</i>	-0.057	0.483						
F-statistics (p-value)	2.070	0.096	F-statistics (p-value)	1.184	0.103	F-statistics (p-value)	1.066	0.411
Adjusted R ²	0.046		Adjusted R ²	0.067		Adjusted R ²		0.048

Notes: *p < 0.05; Dependent variable = *DAC* (Discretionary accruals) using PMMJM

where: *IAF* = Existence of internal audit function; *IAO* = Existence of internal audit outsourcing; *ExtentIAO* = Extent of internal audit outsourcing; *IAQCert* = Internal audit quality certification; *IAQExperi* = Internal audit quality experience; *IAQSize* = Internal audit quality size; *IAQTrain* = Internal audit quality training; *IAQObject* = Internal audit quality objectivity; *IAQTimeFin* = Internal audit quality time spent on financial audits; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

As shown in Table 7.1, the OLS regression results partially supported the main results of Hypotheses H₄, H₅ and H₆; and Hypotheses H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} of this study as presented in Tables 6.7, 6.8 and 6.9, respectively. Specifically, as shown in Table 7.1, the results of Hypothesis H₄ reported that the coefficient of *IAF* (the independent variable) was negative and statistically insignificant (*p*-value= 0.298) based on the statistical *t*-test for the 240 ASX-listed firms in the sample. The main regression result of Hypothesis H₄ presented in Table 6.7 showed a similar negative insignificant association between the existence of internal audit function (*IAF*) and discretionary accruals (*DAC*). A further examination of the results for Hypothesis H₄, as shown in Table 7.1, suggests that, consistent with the main analysis, the coefficient of auditor specialist (*AuditorSpecialist*) was negative and statistically significant. However, *SQRTLev* and *ForgnSubs* showed a similar direction for their coefficients but an insignificant association with discretionary accruals (*DAC*). Furthermore, information technology industry (*IndustryInfoTech*) was the only control variable that showed similar results to the main analysis with that being significant influence to minimise the results of discretionary accruals (*DAC*). In relation to the regression results shown in Table 6.7, the explanatory power of the regression tests for Hypothesis H₄ in Table 7.1 was lower (adjusted *R*² only 4.6% compared to 10.5%). The regression model was also only marginally stable at *p* < 0.1. Therefore, the measurement of discretionary accruals (*DAC*) using the PMMJM was not significantly associated with the reduction of earnings management.

The OLS regression results for Hypotheses H₅ and H₆ along with those for Hypotheses H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f}, as shown in Table 7.1, reported a similar directional (negative) and insignificant association of the existence of internal audit outsourcing (*IAO*) and extent of outsourcing (*ExtentIAO*) with discretionary accruals (*DAC*) compared to the main regression analysis shown in Tables 6.8 and 6.9, respectively. Using the PMMJM does not result in any changes in terms of *IAO* and *ExtentIAO* influencing *DAC*. A further examination of the results, shown in Table 7.1, related to Hypotheses H₅ and H₆; and Hypotheses H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f}, showed that using different measures for *DAC* did

not make any changes in the influence of the audit firm on discretionary accruals (DAC). *AuditorSpecialist* had a significant influence on reducing discretionary accruals (DAC) in both the hypotheses. Compared to the main regression analyses in Tables 6.8 and 6.9, the adjusted R^2 was less (6.7% and 4.8%) in explaining the variation in the dependent variable, *DAC*. The regressions for Hypotheses H₅ and H₆ involved a smaller sample (n=60) and the specified model solutions were not significant for $p < 0.05$. Therefore, using a different measure in line with the PMMJM for *DAC* in Hypotheses H₅ and H₆; and Hypotheses H_{7a}, H_{7b}, H_{7c}, H_{7d}, H_{7e} and H_{7f} did not significantly demonstrate the association of *IAO* and *ExtentIAO* with *DAC*.

7.3 Alternative Measures of Audit Committee Characteristics, Internal Audit Quality and Control Variables

The measurement of audit committee (AC) effectiveness was consistent with the prior literature (Abbott and Parker 2000; Carcello and Neal 2000; Goodwin and Yeo 2001; Raghunandan, Read and Rama 2001; Carcello, Hermanson and Neal 2002; Bédard, Chtourou and Courteau 2004; Carcello, Hermanson and Raghunandan 2005b; Abbott et al. 2007; Barua, Rama and Sharma 2010). There are various ways in which to calculate the AC characteristics used in this study. As discussed in Chapter Four in subsections 4.5.1.1 and 4.5.1.3, independence and frequency of audit committee (AC) meetings were measured using the actual continuous number of independent AC members and number of AC meetings. Alternative measures of *ACIndep* and *ACMeeting* were used in Hypotheses H_{1a1}, H_{1a2}, H_{1a3}, H_{2a1}, H_{2a2} and H_{2a3}; and Hypotheses H_{3a1}, H_{3a2} and H_{3a3} for sensitivity analysis. *ACIndep*, considered a dummy variable, was given a value of 1 in sensitivity analysis if the AC entirely consisted of independent directors; otherwise, the value was 0. Similarly, *ACMeeting*, measured as a dummy variable, was given a value of 1 if the AC met at least four times per annum; otherwise, the value was 0. *ACEExpert*, another AC attribute, was already measured as a dummy variable in the main analysis and was therefore not considered for use with an alternative measure in the sensitivity analysis. The logistic and OLS regressions were re-run

to report the effect of the alternative measures of AC attributes in Hypotheses H_{1a1}, H_{1a2}, H_{1a3}, H_{2a1}, H_{2a2} and H_{2a3}; and in Hypotheses H_{3a1}, H_{3a2} and H_{3a3}.

Internal audit quality (IAQ) attributes represented other independent variables used in Hypotheses H_{2a1}, H_{2a2} and H_{2a3}; and Hypotheses H_{3a1}, H_{3a2} and H_{3a3} to examine IAQ's association with the existence and extent of internal audit outsourcing (IAO). In Chapter Four, subsection 4.5.3, six individual IAQ variables were measured using the actual continuous values for *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain* and *IAQTimeFin*, and dummy values for *IAQObject*. As reported in this section, an alternative measure was used which was a composite score combining six variables and assigning dichotomous values of 1 if it was above the median for the sample of 60 for each variable; otherwise, the value was 0. Scores of each individual component of IAQ were combined to create a composite measure for *IAQ* potentially ranging from 0 to 6, with larger *IAQ* scores indicating higher quality and 0 indicating lower quality.

Furthermore, related control variables used in the analysis of Hypotheses H_{1a1}, H_{1a2}, H_{1a3}, H_{2a1}, H_{2a2} and H_{2a3}; and H_{3a1}, H_{3a2} and H_{3a3} have been altered in firm size, complexity and auditor firm quality categories in the sensitivity analysis. In addition to using *LogMarCap*, *ForgnSubs* and *AuditorSpecialist* in the main analysis, *LogTA* (natural logarithm of total assets), *SQRTSubs* (square root of number of subsidiaries) and *Big4* (Big Four audit firm) have been used as acceptable substitutes. Regressions reported in Table 6.1 for Hypotheses H_{1a}; Table 6.3 for Hypotheses H_{2a}; and Table 6.5 for Hypotheses H_{3a} were re-performed and are presented in Table 7.2 with alternative measures of *ACIndep*, *ACMeeting*, composite score of *IAQ* and control variables (*LogTA*, *SQRTSubs* and *Big4*) to determine if the main regression results in Chapter Six were influenced by the measures of particular variables.

Table 7.2: Logistic and OLS Regression Analyses of Existence of Internal Audit, and Existence and Extent of Internal Audit Outsourcing for Financial Year ended 2011

Regression results of AC effectiveness with <i>IAF</i>				Regression results of AC effectiveness with <i>IAO</i>				Regression results of AC effectiveness with <i>ExtentIAO</i>			
Variables	n=240			Variables	n=60			Variables	n=60		
	Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	p-value	
Constant	15.454	1.000	1.021	Constant	-4.029	0.432	0.018	Constant	19.917	0.781	
<i>ACIndep</i>	0.698	0.037*	1.498	<i>ACIndep</i>	0.094	0.047*	1.104	<i>ACIndep</i>	0.311	0.018*	
<i>ACExpert</i>	0.410	0.321	1.107	<i>ACExpert</i>	0.063	0.957	1.065	<i>ACExpert</i>	0.023	0.864	
<i>ACMeeting</i>	0.499	0.092	1.116	<i>ACMeeting</i>	-0.937	0.233	0.392	<i>ACMeeting</i>	0.223	0.140	
LogTA	1.294	0.000*	3.649	<i>IAQ</i>	0.183	0.524	1.200	<i>IAQ</i>	-0.249	0.049*	
SQRTSubs	-0.028	0.703	0.929	LogTA	0.513	0.361	1.671	LogTA	-0.014	0.930	
<i>Big4</i>	-0.634	0.119	0.530	SQRTSubs	-0.038	0.686	0.963	SQRTSubs	0.006	0.968	
<i>IndustryConDis</i>	-0.318	0.493	0.728	<i>Big4</i>	-20.906	0.432	0.018	<i>Big4</i>	0.057	0.662	
<i>IndustryConStaples</i>	-1.479	0.234	0.228								
<i>IndustryEnergy</i>	0.354	0.474	1.425								
<i>IndustryHealthCare</i>	-0.810	0.231	0.445								
<i>IndustryIndustrials</i>	-1.419	0.011*	0.242								
<i>IndustryInfoTech</i>	-0.761	0.305	0.467								
<i>IndustryTeleCom</i>	-20.183	0.999	0.000								
<i>IndustryUtilities</i>	-1.693	0.152	0.184								
Goodness-of-Fit Statistics				Goodness-of-Fit Statistics							
-2 Log-likelihood	237.156	0.000		-2 Log-likelihood	68.297	0.288					
Hosmer and Lameshow's X^2	8.152	0.419		Hosmer and Lameshow's X^2	7.475	0.486					
Cox and Snell's R^2	0.303			Cox and Snell's R^2	0.135						
Nagelkerke's R^2	0.408			Nagelkerke's R^2	0.185						
Pseudo R^2	0.265			Pseudo R^2	0.110			<i>F</i> -statistics (<i>p</i> -value)	2.821	0.015	
Hit Ratio	75.1%			Hit Ratio	64.4%			Adjusted R^2		0.180	

Notes: * $p < 0.05$ (Wald statistic); Dependent variable = *IAF* (Existence of internal audit function); *IAO* (Existence of internal audit outsourcing); *ExtentIAO* (Extent of internal audit outsourcing)
where:

ACIndep = Audit committee independence; *ACExpert* = Audit committee expertise; *ACMeeting* = Audit committee meetings; *IAQ* = Composite score of internal audit quality combining six IAQ factors; *LogTA* = Natural logarithm of total assets of a firm at end of financial year 2011; *SQRTSubs*= Square root of the number of firm subsidiaries; *Big4* = Big Four external auditor; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* =Utilities industry.

7.3.1 Audit committee independence and meetings

Regression results as shown in Table 7.2 provide support for the main results in Tables 6.1, 6.3 and 6.5 of Chapter Six using alternative measures of *ACIndep*. Specifically, the coefficient of *ACIndep* was positive and significant at $p < 0.05$ based on the statistical *t*-test in all the regression analyses. However, the exception was *ACMeeting* which was not significantly associated with *IAF*, *IAO* and *ExtentIAO* and therefore did not support the main results in Chapter Six.

7.3.2 Internal audit quality attributes

Regression results as shown in Table 7.2 provide support for the main results in Tables 6.3 and 6.5 (i.e., with *IAQObject*) using alternative measures of internal audit quality (*IAQ*). The composite score of *IAQ* used in sensitivity analysis was significantly associated with the extent of internal audit outsourcing (*ExtentIAO*) but not with the existence of internal audit outsourcing (*IAO*). Thus, the sensitivity analyses of Hypotheses H_{2a} and H_{3a} were both supported, as shown in Table 7.2. The logistic and OLS regression models were both stable and significant at $p < 0.05$. The goodness-of-fit data in column 2 of Table 7.2 indicates an adjusted R^2 around 18% which is significant given the small sample size. The OLS regression results also clearly affirm the roles of *ACIndep* and *IAQ* in predicting the extent of internal audit outsourcing (*ExtentIAO*).

7.3.3 Control variables

Using alternative measures of firm size, complexity and audit firm quality in Hypotheses H_{1a1} , H_{1a2} , H_{1a3} , H_{2a1} , H_{2a2} and H_{2a3} ; and Hypotheses H_{3a1} , H_{3a2} and H_{3a3} , as shown in Table 7.2, partially supported the main results in Tables 6.1, 6.3 and 6.5 of Chapter Six. Specifically, the coefficient of *LogTA* in regression analyses of Hypotheses H_{1a1} , H_{1a2} and H_{1a3} was positive and significantly influenced the existence of an internal audit function (*IAF*). Thus, alternative measures of firm size still supported the main results in the analysis of Hypotheses H_{1a1} , H_{1a2} and H_{1a3} . Moreover, sensitivity analysis of Hypotheses H_{2a1} , H_{2a2} and H_{2a3} ; and Hypotheses

H_{3a1} , H_{3a2} and H_{3a3} , in particular of firm complexity (*SQRTSubs*), did not support the main result in which *ForgnSubs* was significantly associated with *IAO*.

7.4 Alternative Measures of Board of Directors' Characteristics, Internal Audit Quality and Control Variables

Board of directors' (BOD) effectiveness was measured using three important attributes of board of directors (BOD). In line with the earlier literature (Beasley 1996; Klein 2002a; Xie, Davidson and DaDalt 2003; Nicholson and Kiel 2004; Sharma 2004; Sun and Liu 2012), board independence (*BODIndep*), size (*BODSize*) and duality (*BODDuality*) were used as common board characteristics. As discussed in Chapter Four, subsection 4.5.2.1, the measure for board independence was the actual continuous number of independent board members. Alternative measures for *BODIndep* and *BODSize* were used for sensitivity analyses of Hypotheses H_{1b1} , H_{1b2} , H_{1b3} , H_{2b1} , H_{2b2} and H_{2b3} ; and Hypotheses H_{3b1} , H_{3b2} and H_{3b3} . As a dummy variable, *BODIndep* was measured by being given a value of 1 if the majority of directors on the board were independent members; otherwise, the value was 0. Furthermore, *BODSize* was measured as a dummy variable by being given a value of 1 if the board consisted of 5–9 members; otherwise, the value was 0. Another BOD characteristic, *BODDuality*, was used as a dummy variable in the main analyses and, therefore, was not considered for use with an alternative measure in the sensitivity analysis. Therefore, logistic and OLS regression analyses were re-performed to examine the effect of alternative measures of BOD characteristics in Hypotheses H_{1b1} , H_{1b2} , H_{1b3} , H_{2b1} , H_{2b2} and H_{2b3} ; and Hypotheses H_{3b1} , H_{3b2} and H_{3b3} .

Internal audit quality (IAQ) attributes were other independent variables used in Hypotheses H_{2b1} , H_{2b2} and H_{2b3} ; and Hypotheses H_{3b1} , H_{3b2} and H_{3b3} to examine an association with the existence and extent of internal audit outsourcing (IAO). In Chapter Four, subsection 4.5.3, six individual IAQ variables were measured using the actual continuous values for *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain* and *IAQTimeFin* and dummy values for *IAQObject*. An alternative measure was used: this was a composite score combining six variables that were

assigned dichotomous values of 1 if it was above the median for the sample of 60 for each variable; otherwise, the value was 0. Scores of each individual component of IAQ were combined to create a composite measure for *IAQ* potentially ranging from 0 to 6, with larger *IAQ* scores indicating higher quality and 0 indicating lower quality.

In terms of control variables, alternative measures of firm size, complexity and auditor firm quality were used in sensitivity analyses of Hypotheses H_{1b1}, H_{1b2}, H_{1b3}, H_{2b1}, H_{2b2} and H_{2b3}; and Hypotheses H_{3b1}, H_{3b2} and H_{3b3}. Rather than using Log*MarCap*, *ForgnSubs* and *AuditorSpecialist* as in the main analyses, Log*TA*, SQRT*Subs* and *Big4* were applied as acceptable alternatives in the sensitivity analyses. Regressions performed, as shown in Table 6.2 for Hypotheses H_{1b1}, H_{1b2} and H_{1b3}; Table 6.4 for Hypotheses H_{2b1}, H_{2b2} and H_{2b3}; and Table 6.6 for H_{3b1}, H_{3b2} and H_{3b3}, were re-performed using alternative measures and presented in Table 7.3 to determine whether or not these alternative measures supported the main results of Chapter Six.

7.4.1 Board independence and size

Regression results, as shown in Table 7.3, did not support the main results shown in Table 6.6 of Chapter Six using the alternative measure of *BODIndep*. Specifically, *BODIndep* was not significant in terms of its association with the existence of internal audit, and the existence or extent of internal audit outsourcing in Hypotheses H_{1b1}, H_{1b2}, H_{1b3}, H_{2b1}, H_{2b2} and H_{2b3}; and H_{3b1}, H_{3b2} and H_{3b3}, respectively. In the sensitivity analysis, *BODIndep* demonstrated a positive significant association with the extent of outsourcing at $p < 0.05$ based on the statistical *t*-test. However, *BODSize* did not support the main results that examined the association of board size with the existence of the internal audit function in Hypotheses H_{2b1}, H_{2b2} and H_{2b3}.

7.4.2 Internal audit quality attributes

Regression results, as shown in Table 7.3, also provided support for the main analyses performed, as shown in Table 6.6 (i.e., with *IAQObject*), using a composite score of *IAQ* to examine the association of *IAQ* with the extent of internal audit outsourcing (*ExtentIAO*). The composite score of *IAQ* was significantly associated with the extent of outsourcing (*ExtentIAO*) but not with the existence of outsourcing (*IAO*). Thus, the sensitivity analysis of Hypotheses H_{2b} and H_{3b} were both supported, as shown in Table 7.3. The OLS regression model was stable and significant at $p < 0.05$. The goodness-of-fit data in column 2 of Table 7.3 indicated an adjusted R^2 around 18.6% which was significant given the small sample size. The OLS model also clearly affirmed the roles of *BODIndep* and *IAQ* in predicting the extent of internal audit outsourcing (*ExtentIAO*).

7.4.3 Control variables

Using alternative measures of firm size, complexity and auditor firm quality in Hypotheses H_{1b1}, H_{1b2}, H_{1b3}, H_{2b1}, H_{2b2} and H_{2b3}; and Hypotheses H_{3b1}, H_{3b2} and H_{3b3}, as shown in Table 7.3, partially supported the main results shown in Tables 6.2, 6.4, and 6.6. In considering the alternative measure of firm size, the coefficient of LogTA in regression analysis of Hypotheses H_{1b1}, H_{1b2} and H_{1b3} was positive and significantly influenced the existence of internal audit function (*IAF*) at the $p < 0.05$ level which supported the main results of Hypotheses H_{1b1}, H_{1b2} and H_{1b3}. An alternative measure for firm complexity, SQRTSubs, was used in sensitivity analysis and did not support the results of Hypotheses H_{3b1}, H_{3b2} and H_{3b3} in the main analysis shown in Table 6.6 of Chapter Six. Firm complexity was not significantly related to any of the dependent variables of *IAF*, *IAO* and *ExtentIAO* in Hypotheses H_{1b1}, H_{1b2}, H_{1b3}, H_{2b1}, H_{2b2} and H_{2b3}; and Hypotheses H_{3b1}, H_{3b2} and H_{3b3}.

The logistic regression results relating to Hypotheses H_{1b1}, H_{1b2} and H_{1b3}, as shown in Table 7.3, were strongly significant with an adjusted R^2 approaching 35%. The variables, *BODDuality* and LogTA (firm size) were positive predictors of the existence of internal audit function (*IAF*). Interestingly, the greater the likelihood that a firm employed the CEO as the

board chair, the higher the probability (61.6%) that the firm also had an internal audit function (IAF). It was considered valuable for the study to further analyse the effect of partitioning industry sectors given the negative influence of the industrials industry sector on the likely employment of an internal audit function (IAF).

Table 7.3: Logistic and OLS Regression Analyses of Existence of Internal Audit, and Existence and Extent of Internal Audit Outsourcing for Financial Year ended 2011

Regression results of BOD effectiveness with <i>IAF</i>				Regression results of BOD effectiveness with <i>IAO</i>				Regression results of BOD effectiveness with <i>ExtentIAO</i>			
Variables	n=240			Variables	n=60			Variables	n=60		
	Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	p-value	
Constant	14.491	1.000	2.561	Constant	-3.299	0.528	0.037	Constant	33.825	0.650	
<i>BODIndep</i>	0.410	0.253	1.663	<i>BODIndep</i>	0.614	0.362	1.541	<i>BODIndep</i>	0.295	0.039*	
<i>BODSize</i>	0.367	0.363	1.443	<i>BODSize</i>	0.166	0.198	1.372	<i>BODSize</i>	0.163	0.264	
<i>BODDuality</i>	0.662	0.049*	1.616	<i>BODDuality</i>	-0.990	0.853	0.372	<i>BODDuality</i>	0.125	0.366	
LogTA	1.329	0.000*	1.777	<i>IAQ</i>	0.116	0.691	1.123	<i>IAQ</i>	0.260	0.047*	
SQRTSubs	-0.046	0.541	0.408	LogTA	-0.033	0.411	0.968	LogTA	-0.050	0.760	
Big4	-0.632	0.117	0.531	SQRTSubs	0.464	0.729	1.591	SQRTSubs	0.022	0.888	
<i>IndustryConDis</i>	-0.221	0.633	0.802	Big4	-20.855	0.999	0.000	Big4	0.054	0.694	
<i>IndustryConStaples</i>	-1.756	0.170	0.173								
<i>IndustryEnergy</i>	0.435	0.380	1.545								
<i>IndustryHealthCare</i>	-0.883	0.176	0.413								
<i>IndustryIndustrials</i>	-1.250	0.022*	0.286								
<i>IndustryInfoTech</i>	-0.971	0.201	0.379								
<i>IndustryTeleCom</i>	-1.719	0.999	0.000								
<i>IndustryUtilities</i>	-1.350	0.243	0.259								
Goodness-of-Fit Statistics				Goodness-of-Fit Statistics							
-2 Log-likelihood	235.513	0.000		-2 Log-likelihood	67.912	0.259					
Hosmer and Lameshow's X^2	6.051	0.642		Hosmer and Lameshow's X^2	10.568	0.227					
Cox and Snell's R^2	0.319			Cox and Snell's R^2	0.140						
Nagelkerke's R^2	0.429			Nagelkerke's R^2	0.193						
Pseudo R^2	0.282			Pseudo R^2	0.116			F-statistics (p-value)	2.088	0.062	
Hit Ratio	77.1%			Hit Ratio	69.5%			Adjusted R^2		0.186	

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function); *IAO* (Existence of internal audit outsourcing); *ExtentIAO* (Extent of internal audit outsourcing) where:

BODIndep = Board of directors' independence; *BODSize* = Board of directors' size; *BODDuality* = Board of directors' duality; *IAQ* = Composite score of internal audit quality combining six IAQ factors; *LogTA* = Natural logarithm of total assets of a firm at end of financial year 2011; *SQRTSubs* = Square root of the number of firm subsidiaries; *Big4* = Big Four external auditor; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.5 Additional Analyses by Partitioning of the Sample

The following section discusses the robustness and sensitivity analyses of the main results provided in Chapter Six. The sample was partitioned by five firm characteristics: firm size, firm risk, firm complexity, auditor firm quality and industry. Firm size was partitioned by dividing the sample of 240 firms into two groups; the firms belonging to the top 250 and to the bottom 250 as per the ranking by market capital value from the top 500 ASX-listed firms. Partitioning of firm risk and complexity was done with the relevant split point (i.e., median) of the firms. Auditor firm quality was also used for partitioning on the basis of firms employing or not employing specialised audit firms. Later, industry partitioning of major and other industry groups was used for partitioning of firms in the sample. Subsections 7.3.1 to 7.3.5 discuss the results of the related analyses of the main analysis in Chapter Six after the sample was partitioned by the firm characteristics stated above.

7.5.1 Firm size partitioning

Tables 7.4 and 7.5 show the regression results when firms in the sample were partitioned by firm size and the main regression results of Chapter Six, Tables 6.1, 6.2 and 6.7 were re-run. Partitioning by firm size was performed to determine if the main regression results of Hypotheses H_{1a1} , H_{1a2} , H_{1a3} , H_{1b1} , H_{1b2} , H_{1b3} and H_4 in Tables 6.1, 6.2 and 6.7, respectively, were influenced by whether the size of a firm was larger or smaller. Specifically, the partitioning examined whether larger or smaller firms (as measured by logarithm of market capitalisation [LogMarCap]) influenced the existence of the internal audit function (*IAF*) and discretionary accruals (*DAC*) in the main results. Median values of the logarithm of market capitalisation of the 240 firms in the sample were used as split point in this case.

The logistic regression results, shown in Table 7.4, partially supported the main results of Hypotheses H_{1a1} , H_{1a2} and H_{1a3} presented in Chapter Six, Table 6.1 of this study. Specifically, the results suggested that the coefficient of *ACIndep* was positive and statistically significant for both larger and smaller firms (*p*-value = 0.002 and 0.012, respectively).

However, the coefficient of *ACMeeting* was positive but statistically insignificant for both larger and smaller firms. Therefore, this additional analysis reported that, even after partitioning the sample by firm size, only *ACIndep* was significantly associated with the existence of internal audit function (*IAF*). Furthermore, partitioning by firm size in terms of investigating the association of AC attributes with the existence of IAF provided interesting insights from comparing larger and smaller firms. It is clearly evident that larger firms with more foreign subsidiaries were more likely to employ an internal audit function (*IAF*). Larger firms in the industrials industry sector strongly influenced the establishment of an internal audit function (*IAF*).

Results of another logistic regression, as shown in Table 7.4, also partially supported the main results of Hypotheses H_{1b1} , H_{1b2} and H_{1b3} presented in Chapter Six, Table 6.2 of this study. The results suggested that the coefficient of *BODSize* was positive and statistically significant for both larger and smaller firms (p -value = 0.038 and 0.002, respectively). However, the coefficient of another BOD characteristic, *BODDuality*, was positive for larger and smaller firms but statistically significant only for smaller firms at p -value = 0.019. Therefore, regression results for Hypothesis H_{1b} reported that *BODSize* was significantly associated with *IAF* in both smaller and larger firms. However, *BODDuality* of smaller firms only significantly influenced the existence of internal audit function (*IAF*) of ASX-listed firms after partitioning the sample by firm size. Partitioning by firm size to investigate whether BOD attributes influenced the establishment of an IAF provided important insights. It was evident that firms with more foreign subsidiaries (the proxy for firm complexity) significantly influenced the establishment of an internal audit function (*IAF*). Larger firms within the industrials and information technology industry sectors were more likely to influence the decision to establish an IAF decision than smaller firms.

The OLS regression results, shown in Table 7.5, supported the main results of Hypothesis H_4 presented in Chapter Six, Table 6.7. Specifically, the results suggested that the coefficient of *IAF* (the independent variable) was negative and statistically insignificant for

both larger and smaller firms (p -value = 0.905 and 0.271, respectively) in the sample. This sensitivity analysis clearly supported the main results, as shown in Chapter Six, that the existence of an internal audit function (*IAF*) was not significantly associated with the reduction of discretionary accruals even after partitioning the sample by firm size.

Moreover, firms partitioned by firm size showed some important insights when investigating the association of the existence of *IAF* (*IAF*) with discretionary accruals (*DAC*). It was evident that larger firms, that is, firms that are more likely to experience risk (measured by *SQRTLEV*) and which utilise specialised auditors, significantly influenced discretionary accruals (*DAC*). Thus, larger firms tended to engage specialised auditors to properly manage firm risk and thereby significantly influenced the practice of financial reporting. The goodness-of-fit model for larger firms was also more stable with a higher adjusted R^2 compared to that of smaller firms.

Table 7.4: Logistic Regression Analysis of Existence of Internal Audit for Financial Year ended 2011: Partitioning by Firm Size

Regression results of AC effectiveness with <i>IAF</i>							Regression results of BOD effectiveness with <i>IAF</i>							
Variables	Larger firms			Smaller firms			Variables	Larger firms			Smaller firms			
	n=117			n=123				n=117			n=123			
	Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	Wald Statistic	Exp(B)	Beta Coeff.	Wald Statistic	Exp(B)	
Constant	18.934	1.000	3.548	19.151	0.999	5.362	Constant	16.434	1.000	3.265	19.497	0.999	4.235	
<i>ACIndep</i>	0.024	0.002	1.024	0.011	0.012*	1.011	<i>BODIndep</i>	1.459	0.124	4.303	0.532	0.643	1.703	
<i>ACEExpert</i>	0.050	0.926	1.051	0.971	0.277	2.641	<i>BODSize</i>	0.048	0.038*	1.049	0.489	0.002*	1.631	
<i>ACMeeting</i>	0.103	0.443	1.102	0.510	0.374	1.665	<i>BODDuality</i>	0.321	0.531	1.025	1.763	0.019*	1.171	
<i>LogMarCap</i>	1.266	0.042*	3.548	1.136	0.015*	3.115	<i>LogMarCap</i>	0.830	0.219	2.294	0.178	0.134	2.249	
<i>ForgnSubs</i>	-1.303	0.050*	0.272	-0.717	0.370	0.247	<i>ForgnSubs</i>	-1.327	0.041*	0.265	-1.742	0.036*	0.100	
<i>AuditorSpecialist</i>	0.382	0.446	0.682	-0.275	0.631	0.760	<i>AuditorSpecialist</i>	-0.543	0.248	0.581	-0.451	0.445	0.637	
<i>IndustryConDis</i>	-1.176	0.101	0.308	0.788	0.255	2.199	<i>IndustryConDis</i>	-1.120	0.107	0.326	0.792	0.284	2.208	
<i>IndustryConStaples</i>	-2.615	0.143	0.073	-1.990	0.566	0.000	<i>IndustryConStaples</i>	-2.163	0.187	0.115	-7.131	0.999	0.000	
<i>IndustryEnergy</i>	0.242	0.744	0.785	1.416	0.078	4.119	<i>IndustryEnergy</i>	-0.422	0.563	0.655	1.141	0.191	3.129	
<i>IndustryHealthCare</i>	0.234	0.783	0.791	-0.786	0.581	0.455	<i>IndustryHealthCare</i>	-0.732	0.380	0.481	-2.594	0.106	0.075	
<i>IndustryIndustrials</i>	-2.041	0.006*	0.130	-0.614	0.520	0.541	<i>IndustryIndustrials</i>	-1.972	0.004*	0.139	-0.915	0.352	0.400	
<i>IndustryInfoTech</i>	-1.685	0.068	0.185	-0.614	0.520	1.795	<i>IndustryInfoTech</i>	-1.732	0.042*	0.177	-1.761	0.266	0.172	
<i>IndustryTeleCom</i>	-1.235	0.102	0.145	-2.979	0.799	0.000	<i>IndustryTeleCom</i>	-1.532	0.526	0.126	-1.124	0.256	0.000	
<i>IndustryUtilities</i>	-3.172	0.523	0.000	-0.348	0.775	0.706	<i>IndustryUtilities</i>	-2.475	1.000	0.000	-0.539	0.671	0.583	
Goodness-of-Fit Statistics							Goodness-of-Fit Statistics							
-2 Log-likelihood	117.216	0.001		103.568	0.006		-2 Log-likelihood	126.189	0.010		92.471	0.000		
Hosmer and Lameshow's X^2	7.474	0.486		4.079	0.850		Hosmer and Lameshow's X^2	14.726	0.065		6.492	0.592		
Cox and Snell's R^2	0.257			0.221			Cox and Snell's R^2	0.211			0.289			
Nagelkerke's R^2	0.350			0.333			Nagelkerke's R^2	0.288			0.434			
Pseudo R^2	0.224			0.231			Pseudo R^2	0.179			0.313			
Hit Ratio	75.4%			78.0%			Hit Ratio	75.2%			80.5%			

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function)

where:

$ACIndep$ = Audit committee independence; $ACExpert$ = Audit committee expertise; $ACMeeting$ = Audit committee meetings; $BODIndep$ = Board of directors' independence; $BODSize$ = Board of directors' size; $BODDuality$ = Board of directors' duality; $LogMarCap$ = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; $ForgnSubs$ = Number of foreign subsidiaries divided by total number of subsidiaries; $AuditorSpecialist$ = External auditor specialist; $IndustryConDis$ = Consumer discretionary industry; $IndustryConStaples$ = Consumer staples industry; $IndustryEnergy$ = Energy industry; $IndustryHealthCare$ = Health care industry; $IndustryIndustrials$ = Industrials industry; $IndustryInfoTech$ = Information technology industry; $IndustryMaterials$ = Materials industry; $IndustryTeleCom$ = Telecommunications industry; $IndustryUtilities$ = Utilities industry.

Table 7.5: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011: Partitioning by Firm Size

Regression results of <i>IAF</i> with <i>DAC</i>					
Larger Firms n=117			Smaller Firms n=123		
Variables	Beta Coeff.	p-value	Variables	Beta Coeff.	p-value
Constant	-1.515	0.294	Constant	1.148	0.797
<i>IAF</i>	-0.099	0.316	<i>IAF</i>	-0.771	0.444
<i>ACEExpert</i>	0.014	.0882	<i>ACEExpert</i>	-1.608	0.113
<i>LogMarCap</i>	0.128	0.212	<i>LogMarCap</i>	-0.023	0.982
<i>SQRTLev</i>	0.231	0.022*	<i>SQRTLev</i>	0.882	0.381
<i>ForgnSubs</i>	-0.052	0.600	<i>ForgnSubs</i>	-2.247	0.029*
<i>AuditorSpecialist</i>	-0.236	0.020*	<i>AuditorSpecialist</i>	-1.705	0.094
<i>IndustryConDis</i>	-0.007	.0948	<i>IndustryConDis</i>	-0.925	0.359
<i>IndustryConStaples</i>	0.009	0.930	<i>IndustryConStaples</i>	0.425	0.672
<i>IndustryEnergy</i>	-0.121	0.277	<i>IndustryEnergy</i>	-0.407	0.686
<i>IndustryHealthCare</i>	-0.081	0.442	<i>IndustryHealthCare</i>	0.134	0.894
<i>IndustryIndustrials</i>	-0.413	0.205	<i>IndustryIndustrials</i>	-0.824	0.413
<i>IndustryInfoTech</i>	-0.073	0.457	<i>IndustryInfoTech</i>	-1.866	0.067
<i>IndustryTeleCom</i>	-0.113	0.205	<i>IndustryTeleCom</i>	-0.125	0.425
<i>IndustryUtilities</i>	-0.117	0.270	<i>IndustryUtilities</i>	-0.704	0.484
F-statistics (p-value)	1.594	0.095	F-statistics (p-value)	1.208	0.298
Adjusted R ²	0.070		Adjusted R ²	0.037	

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.5.2 Firm risk partitioning

Table 7.6 shows the OLS regression results of Hypothesis H₄ when the firms in the sample were partitioned by firm risk and the main regression results of Chapter Six, Table 6.7 were re-run. Partitioning by firm risk was performed to determine if the main regression results of Hypothesis H₄ in Table 6.7 was influenced by the effects of more or less risky firms. Specifically, it was necessary to establish whether firm risk (as measured by the square root of leverage [SQRTLev]) has an influence on discretionary accruals (*DAC*) in the main results. The median SQRTLev values of firms in the sample were used as the split point to differentiate between more risky and less risky firms. Partitioning of the sample by firm risk and the re-run of regressions relating to Hypotheses H₅ and H₆ were not possible due to the limited sample number.

The OLS regression results, shown in Table 7.6, supported the main results of Hypothesis H₄ presented in Chapter Six, Table 6.7 of this study. Specifically, the results suggested that the coefficient of *IAF* (the independent variable) was positive and statistically insignificant for more risky firms (*p*-value = 0.305). However, consistent with the main regression results for Hypothesis H₄ shown on Table 6.7, the coefficient of *IAF* was negative and still insignificant for less risky firms (*p*-value = 0.271). Therefore, this additional analysis reported that *IAF* was not significantly associated with the reduction of earnings management (as measured by discretionary accruals [*DAC*]) even after partitioning the sample by firm risk.

Firms were partitioned by firm risk and investigated in association with the existence of *IAF* (*IAF*) and discretionary accruals (*DAC*). A stable regression model was the result for firms identified within the low risk sector ($R^2 = 12.8\%$). A strong positive association was reported with respect to risk itself (SQRTLev): the use of discretionary accruals (DAC) for the financial year ended 2011 and the use of foreign subsidiaries were also negatively associated with the use of discretionary accruals (DAC). These relationships appeared logical; however, there was no indication that the existence of an IAF has any bearing on the position of these firms in relation to risk.

Table 7.6: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011: Partitioning by Firm Risk

Regression results of <i>IAF</i> with <i>DAC</i>					
More Risky Firms			Less Risky Firms		
n=91			n=149		
Variables	Beta Coeff.	p-value	Variables	Beta Coeff.	p-value
Constant	-2.909	0.136	Constant	0.623	0.741
<i>IAF</i>	-0.014	0.305	<i>IAF</i>	-0.132	0.271
<i>ACEExpert</i>	0.054	0.633	<i>ACEExpert</i>	-0.171	0.105
<i>LogMarCap</i>	0.240	0.033*	<i>LogMarCap</i>	-0.019	0.868
<i>SQRTLev</i>	0.105	0.032*	<i>SQRTLev</i>	0.408	0.000*
<i>ForgnSubs</i>	-0.201	0.100	<i>ForgnSubs</i>	-0.265	0.015*
<i>AuditorSpecialist</i>	-0.266	0.025*	<i>AuditorSpecialist</i>	-0.162	0.156
<i>IndustryConDis</i>	0.024	0.862	<i>IndustryConDis</i>	-0.072	0.527
<i>IndustryConStaples</i>	0.082	0.506	<i>IndustryConStaples</i>	-0.080	0.450
<i>IndustryEnergy</i>	-0.168	0.169	<i>IndustryEnergy</i>	-0.009	0.393
<i>IndustryHealthCare</i>	-0.028	0.806	<i>IndustryHealthCare</i>	0.027	0.811
<i>IndustryIndustrials</i>	-0.170	0.230	<i>IndustryIndustrials</i>	-0.014	0.904
<i>IndustryInfoTech</i>	-0.173	0.166	<i>IndustryInfoTech</i>	-0.174	0.111
<i>IndustryTeleCom</i>	-0.131	0.228	<i>IndustryTeleCom</i>	-0.085	0.426
<i>IndustryUtilities</i>	-0.113	0.394	<i>IndustryUtilities</i>	0.129	0.224
F-statistics (p-value)	1.395	0.177	F-statistics (p-value)	1.914	0.038
Adjusted R ²	0.058		Adjusted R ²	0.124	

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.5.3 Firm complexity partitioning

Table 7.7 presents the OLS regression results for Hypothesis H₄ when firms in the sample were partitioned by firm complexity and compared with the main regression results presented in Chapter Six, Table 6.7. Partitioning by firm complexity was performed to determine if the main regression results of Hypothesis H₄ shown in Table 6.7 were influenced by the effects of more or less complex firms. Specifically, the analysis would establish whether firm complexity (as measured by the number of foreign subsidiaries [*ForgnSubs*]) influenced discretionary accruals (*DAC*). The median values of *ForgnSubs* for firms in the sample were used as the split point to differentiate between more and less complex firms. Partitioning of the sample by firm complexity and re-running the regressions with respect to Hypotheses H_{2a1}, H_{2a2}, H_{2a3}, H_{3a1}, H_{3a2} and H_{3a3}; and H_{3b1}, H_{3b2} and H_{3b3} were not possible due to the limited number in the sample.

The OLS regression results, shown in Table 7.7, supported the main results of Hypothesis H₄ presented in Chapter Six, Table 6.7 of this study. Specifically, the results suggested that the coefficient of *IAF* (the independent variable) was positive but statistically insignificant for more complex firms (*p*-value = 0.336). However, consistent with the main regression results for Hypothesis H₄ shown in Table 6.7, the coefficient of *IAF* was negative and insignificant for less complex firms (*p*-value = 0.375). Therefore, this additional analysis reported that *IAF* was not significantly associated with the reduction of earnings management (as measured by discretionary accruals [*DAC*]) even after partitioning the sample by firm complexity.

Partitioning by firm complexity in association with existence of internal audit function (*IAF*) and the influences on *DAC* provided some potentially interesting insights. However, the regression models were less than marginally stable (*p* > 0.05) and the effect of complexity and risk on discretionary accruals (*DAC*) must be questioned in this analysis.

Table 7.7: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011: Partitioning by Firm Complexity

Regression results of <i>IAF</i> with <i>DAC</i>					
More Complex Firms n=90			Less Complex Firms n=150		
Variables	Beta Coeff.	p-value	Variables	Beta Coeff.	p-value
Constant	-0.699	0.693	Constant	-1.582	0.454
<i>IAF</i>	-0.113	0.336	<i>IAF</i>	-0.102	0.375
<i>ACEExpert</i>	-0.102	0.374	<i>ACEExpert</i>	-0.105	0.366
<i>LogMarCap</i>	0.041	0.728	<i>LogMarCap</i>	0.153	0.235
<i>SQRTLev</i>	0.273	0.013*	<i>SQRTLev</i>	0.165	0.212
<i>ForgnSubs</i>	-0.104	0.367	<i>ForgnSubs</i>	-0.070	0.548
<i>AuditorSpecialist</i>	-0.305	0.020*	<i>AuditorSpecialist</i>	-0.156	0.191
<i>IndustryConDis</i>	0.113	0.363	<i>IndustryConDis</i>	-0.159	0.247
<i>IndustryConStaples</i>	0.077	0.532	<i>IndustryConStaples</i>	-0.040	0.735
<i>IndustryEnergy</i>	0.040	0.753	<i>IndustryEnergy</i>	-0.158	0.217
<i>IndustryHealthCare</i>	0.079	0.506	<i>IndustryHealthCare</i>	-0.150	0.182
<i>IndustryIndustrials</i>	-0.001	0.992	<i>IndustryIndustrials</i>	-0.252	0.067
<i>IndustryInfoTech</i>	-0.008	0.444	<i>IndustryInfoTech</i>	-0.231	0.067
<i>IndustryTeleCom</i>	-0.033	0.758	<i>IndustryTeleCom</i>	-0.134	0.220
<i>IndustryUtilities</i>	0.107	0.318	<i>IndustryUtilities</i>	-0.215	0.105
F-statistics (p-value)	1.681	0.078	F-statistics (p-value)	0.977	0.485
Adjusted R ²	0.097		Adjusted R ²	-0.004	

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.5.4 Auditor firm quality partitioning

Table 7.8 presents the OLS regression results of Hypothesis H₄ when the firms in the sample were partitioned by auditor firm quality and re-run in the same fashion as reported in Chapter Six, Table 6.7. Using an alternative measure of auditor firm quality, that is, *Big4* instead of *AuditorSpecialist* did not provide any significant influence in association with *IAF*, *IAO* or *ExtentIAO*. Partitioning of firms by auditor firm quality was performed in addition to determine if the main regression results of Hypothesis H₄ in Table 6.7 were influenced by the effects of using or not using a specialised auditor for the ASX-listed firms in the sample. Specifically, the tests established whether auditor firm quality (as measured by the presence of a specialised auditor [*AuditorSpecialist*]) influenced discretionary accruals (DAC) in the partitioned results. Partitioning of firms in the sample based on whether or not they had a specialised auditor and re-running the regression analyses used for Hypotheses H₅ and H₆ were not possible because the respective size of the sample was limited.

The OLS regression results, as shown in Table 7.8, supported the main results of Hypothesis H₄ presented in Chapter Six, Table 6.7 of this study but the goodness of fit was unsatisfactory ($p > 0.05$) and any potential associations were potentially spurious. Specifically, the results suggested that the coefficient of *IAF* (the independent variable) was positive yet statistically insignificant for firms with a specialised auditor (p -value = 0.251). However, consistent with the main regression results for Hypothesis H₄ shown in Table 6.7, the coefficient of *IAF* was negative and was still insignificant for firms with no specialised auditor (p -value = 0.545). Therefore, this additional analysis indicated that *IAF* was not significantly associated with the reduction of earnings management (as measured by discretionary accruals [DAC]) even after partitioning the sample by auditor firm quality.

It was clearly evident from the partitioning by auditor firm quality that firms with a specialised auditor have a significant amount of firm risk and complexity. This situation can be described in another way by stating that, due to the significant risk and complexity

occurring within firms, firms demand to have specialised auditor. The goodness-of-fit model was more stable with a higher adjusted R^2 compared to firms without a specialised auditor.

Table 7.8: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011: Partitioning by Auditor Firm Quality

Regression results of <i>IAF</i> with <i>DAC</i>					
Firms with Specialised Auditor			Firms without Specialised Auditor		
n=109			n=131		
Variables	Beta Coeff.	p-value	Variables	Beta Coeff.	p-value
Constant	-1.363	0.332	Constant	-1.825	0.493
<i>IAF</i>	-0.118	0.251	<i>IAF</i>	-0.084	0.545
<i>ACEExpert</i>	-0.063	0.520	<i>ACEExpert</i>	-0.105	0.443
<i>LogMarCap</i>	0.079	0.454	<i>LogMarCap</i>	0.139	0.313
<i>SQRTLev</i>	0.235	0.021*	<i>SQRTLev</i>	0.086	0.557
<i>ForgnSubs</i>	-0.246	0.013*	<i>ForgnSubs</i>	-0.132	0.334
<i>IndustryConDis</i>	-0.044	0.685	<i>IndustryConDis</i>	0.014	0.933
<i>IndustryConStaples</i>	-0.023	0.822	<i>IndustryConStaples</i>	0.032	0.834
<i>IndustryEnergy</i>	-0.093	0.379	<i>IndustryEnergy</i>	-0.087	0.600
<i>IndustryHealthCare</i>	0.005	0.961	<i>IndustryHealthCare</i>	-0.067	0.653
<i>IndustryIndustrials</i>	-0.142	0.206	<i>IndustryIndustrials</i>	-0.159	0.352
<i>IndustryInfoTech</i>	-0.164	0.111	<i>IndustryInfoTech</i>	-0.163	0.254
<i>IndustryTeleCom</i>	-0.130	0.189	<i>IndustryUtilities</i>	-0.140	0.331
<i>IndustryUtilities</i>	-0.057	0.575			
F-statistics (p-value)	1.578	0.105	F-statistics (p-value)	0.533	0.885
Adjusted R ²		0.065	Adjusted R ²		-0.084

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.5.5 Industry partitioning

Tables 7.9, 7.10 and 7.11 present the logistic and OLS regression results of Hypothesis H_{1a1}, H_{1a2}, H_{1a3}, H_{1b1}, H_{1b2}, H_{1b3} and H₄ when the firms in the sample were partitioned by industry and the main regression associated with Chapter Six, Tables 6.1, 6.2 and 6.7 were re-run. Referring to the main results in Chapter Six, firms from the industrials industry sector demonstrated a consistent positive influence on the existence of IAF (*IAF*) in association with AC and BOD effectiveness. However, information technology sector firms showed a statistically positive significant influence on the existence of IAF (*IAF*) only in association with BOD effectiveness. Moreover, investigating the association of *IAF* with *DAC* in Hypothesis H₄ showed that only consumer discretionary and consumer staples industry sectors had a significant positive influence on *DAC*. Therefore, there are differences in terms of industry sector partitioning and the influence of industry sector on the decision to use an IAF and discretionary accruals (*DAC*). Additional analyses were therefore performed partitioning by industry sector to determine if the main regression results for Hypotheses H_{1a1}, H_{1a2}, H_{1a3}, H_{1b1}, H_{1b2}, H_{1b3} and H₄ shown in Chapter Six were affected. The firms in the sample were split into two industry groups: major (consisting of materials, industrials and consumer discretionary) and ‘others’ (consisting of consumer staples, energy, health care, information technology, telecommunications and utilities). Specifically, sensitivity analysis would examine whether being in one or the other two industry groups (major and others) had any influence on the main results for *IAF* in Hypotheses H_{1a1}, H_{1a2}, H_{1a3}, H_{1b1}, H_{1b2} and H_{1b3}, and for *DAC* in Hypothesis H₄.

The logistic regression results, presented in Table 7.9, partially supported the main results of Hypotheses H_{1a1}, H_{1a2} and H_{1a3}, as shown in Chapter Six, Table 6.1 of this study. Specifically, the results suggested that the coefficient of *ACIndep* was positive and statistically significant for both major and ‘others’ industry groups (*p*-value = 0.013 and 0.043, respectively). However, the coefficient of *ACMeeting* was still positive but statistically insignificant for both industry groups of firms in the sample. Therefore, the sensitivity analysis

reported that only *ACIndep* was significantly associated with the existence of internal audit function (*IAF*) even after partitioning the sample by industry. Table 7.9 provides further information that firms in the industrials industry sector significantly influenced the decision about the existence of the *IAF* in comparison with firms in the materials industry sector which was considered the base industry sector in the analysis. Compared to the ‘others’ industry group in which the energy industry sector was the base industry sector, none of the individual sectors had any significant influence on the *IAF* decision.

Further logistic regression results, presented in Table 7.10, also partially supported the main results of Hypotheses H_{1b1} , H_{1b2} and H_{1b3} shown in Chapter Six, Table 6.2 of this study. The results suggested that the coefficient of *BODSize* was positive and statistically significant for both major and ‘others’ industry groups (p -value = 0.002 and 0.008, respectively). However, the coefficient of *BODDuality* was negative and statistically insignificant for both industry sectors. Furthermore, the regression results of Hypothesis H_{1b} for *BODIndep* were different from the main results. Board independence had a positive and significant association with *IAF* for the major industry group only. Therefore, Hypotheses H_{1b1} , H_{1b2} and H_{1b3} regression results reported that *BODIndep* and *BODSize* were significantly associated with *IAF* in the major and ‘others’ industry groups, respectively. However, for *BODDuality*, neither industry group displayed any significant influence on the existence of internal audit in the ASX-listed firms in the sample. Table 7.10 provides additional information that, in comparison with the materials industry sector (which is the base industry in the major group), the industrials sector firms were more likely to have an internal audit function (*IAF*) compared to other industry sector groups. This deserves further review.

The OLS regression results, presented in Table 7.11, supported the main results of Hypothesis H_4 shown in Chapter Six, Table 6.7. Specifically, the results suggested that the coefficient of *IAF* (the independent variable) was negative and statistically insignificant for the major industry group that consisted of materials, industrials and consumer discretionary industry sectors (p -value = 0.802). However, the coefficient of *IAF* was positive and

statistically insignificant for the ‘others’ industry group (p -value = 0.362). This sensitivity analysis clearly supported the main results shown in Chapter Six indicating that the *IAF* was not significantly associated with the reduction of discretionary accruals (*DAC*) even after partitioning the sample by industry. Table 7.11 also shows similar findings in terms of the major and ‘others’ industry groups. In the major industry group which used the materials industry sector as the base industry (when applying dichotomous variables), firms were less likely to engage in earnings management compared to firms in the ‘others’ group. None of the industry sector groups has shown significant association with discretionary accruals (*DAC*).

A further analysis of firms within the industrials industry sector deserves attention; however, the relatively small size of the sample in this study restricts any significant research.

Table 7.9: Logistic Regression Analysis of Existence of Internal Audit for Financial Year ended 2011: Partitioning by Industry

Regression results of AC effectiveness with <i>IAF</i>							
Materials, Industrials and Consumer Discretionary Industries				All Other Industries			
Variables	n=162			Variables	n=78		
	Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	Wald Statistic	Exp(B)
Constant	-4.401	1.000	0.012	Constant	3.699	1.000	40.394
<i>ACIndep</i>	0.016	0.013*	1.017	<i>ACIndep</i>	0.021	0.043*	1.023
<i>ACExpert</i>	0.123	0.819	1.131	<i>ACExpert</i>	0.309	0.656	1.361
<i>ACMeeting</i>	0.146	0.200	1.157	<i>ACMeeting</i>	0.111	0.511	1.118
<i>LogMarCap</i>	0.750	0.026*	2.116	<i>LogMarCap</i>	1.579	0.002*	4.852
<i>ForgnSubs</i>	-0.570	0.299	0.565	<i>ForgnSubs</i>	-0.229	0.805	0.795
<i>AuditorSpecialist</i>	-0.602	0.155	0.548	<i>AuditorSpecialist</i>	-0.053	0.933	0.948
<i>IndustryConDis</i>	-0.397	0.366	0.672	<i>IndustryConStaples</i>	-0.625	0.725	0.535
<i>IndustryIndustrials</i>	-1.416	0.011*	0.243	<i>IndustryHealthCare</i>	1.309	0.379	3.703
				<i>IndustryInfoTech</i>	0.554	0.705	1.741
				<i>IndustryTeleCom</i>	-2.189	0.999	0.000
				<i>IndustryUtilities</i>	1.536	0.852	3.102
Goodness-of-Fit Statistics				Goodness-of-Fit Statistics			
-2 Log-likelihood	169.609	0.000		-2 Log-likelihood	71.136	0.000	
Hosmer and Lameshow's X^2	7.489	0.485		Hosmer and Lameshow's X^2	7.058	0.530	
Cox and Snell's R^2	0.261			Cox and Snell's R^2	0.351		
Nagelkerke's R^2	0.350			Nagelkerke's R^2	0.474		
Pseudo R^2	0.220			Pseudo R^2	0.321		
Hit Ratio	67.3%			Hit Ratio	78.2%		

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function)

where:

ACIndep = Audit committee independence; *ACExpert* = Audit committee expertise; *ACMeeting* = Audit committee meetings; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

Table 7.10: Logistic Regression Analysis of Existence of Internal Audit for Financial Year ended 2011: Partitioning by Industry

Regression results of BOD effectiveness with <i>IAF</i>							
Materials, Industrials and Consumer Discretionary Industries				All Other Industries			
Variables	n=162			Variables	n=78		
	Beta Coeff.	Wald Statistic	Exp(B)		Beta Coeff.	Wald Statistic	Exp(B)
Constant	-4.066	1.000	0.017	Constant	-9.186	1.000	0.000
<i>BODIndep</i>	2.026	0.014*	3.584	<i>BODIndep</i>	-1.753	0.212	0.173
<i>BODSize</i>	0.335	0.002*	1.397	<i>BODSize</i>	0.030	0.008*	1.030
<i>BODDuality</i>	-0.463	0.309	0.629	<i>BODDuality</i>	-2.315	0.108	0.099
<i>LogMarCap</i>	0.672	0.033*	1.957	<i>LogMarCap</i>	1.817	0.001*	6.154
<i>ForgnSubs</i>	-1.083	0.063	0.339	<i>ForgnSubs</i>	0.248	0.794	1.281
<i>AuditorSpecialist</i>	-0.548	0.206	0.578	<i>AuditorSpecialist</i>	-0.529	0.422	0.589
<i>IndustryConDis</i>	-0.317	0.482	0.728	<i>IndustryConStaples</i>	-3.010	0.147	0.049
<i>IndustryIndustrials</i>	-1.647	0.003*	0.193	<i>IndustryHealthCare</i>	0.396	0.785	1.486
				<i>IndustryInfoTech</i>	-0.285	0.844	0.752
				<i>IndustryTeleCom</i>	-2.980	0.999	0.000
				<i>IndustryUtilities</i>	-2.102	0.725	0.000
Goodness-of-Fit Statistics				Goodness-of-Fit Statistics			
-2 Log-likelihood	161.990	0.000		-2 Log-likelihood	66.478	0.000	
Hosmer and Lameshow's X^2	7.276	0.507		Hosmer and Lameshow's X^2	5.945	0.653	
Cox and Snell's R^2	0.312			Cox and Snell's R^2	0.388		
Nagelkerke's R^2	0.418			Nagelkerke's R^2	0.525		
Pseudo R^2	0.272			Pseudo R^2	0.365		
Hit Ratio	73.5%			Hit Ratio	80.8%		

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *IAF* (Existence of internal audit function)

where:

BODIndep = Board of directors' independence; *BODSize* = Board of directors' size; *BODDuality* = Board of directors' duality; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

Table 7.11: OLS Regression Analysis of Discretionary Accruals for Financial Year ended 2011: Partitioning by Industry

Regression results of <i>IAF</i> with <i>DAC</i>					
Materials, Industrials and Consumer Discretionary Industries			All Other Industries		
	n=162			n=78	
Variables	Beta Coeff.	p-value	Variables	Beta Coeff.	p-value
Constant	-2.318	0.183	Constant	1.187	0.474
<i>IAF</i>	-0.069	0.802	<i>IAF</i>	-0.292	0.362
<i>ACEExpert</i>	-0.292	0.453	<i>ACEExpert</i>	-0.547	0.082
<i>LogMarCap</i>	0.0360	0.083	<i>LogMarCap</i>	-0.150	0.447
<i>SQRTLev</i>	1.130	0.101	<i>SQRTLev</i>	2.137	0.018*
<i>ForgnSubs</i>	-0.924	0.015*	<i>ForgnSubs</i>	-0.329	0.409
<i>AuditorSpecialist</i>	-0.625	0.026*	<i>AuditorSpecialist</i>	-0.427	0.038*
<i>IndustryConDis</i>	-0.143	0.629	<i>IndustryConStaples</i>	0.145	0.739
<i>IndustryIndustrials</i>	-1.442	0.025*	<i>IndustryHealthCare</i>	-0.161	0.662
			<i>IndustryInfoTech</i>	1.004	0.126
			<i>IndustryTeleCom</i>	-1.141	0.142
			<i>IndustryUtilities</i>	-0.847	0.125
F-statistics (p-value)	1.874	0.056	F-statistics (p-value)	1.847	0.070
Adjusted R ²	0.080		Adjusted R ²	0.033	

Notes: *p < 0.05 (Wald statistic)

Dependent variable = *DAC* (Discretionary accruals)

where:

IAF = Existence of internal audit function; *ACEExpert* = Audit committee expertise; *LogMarCap* = Natural logarithm of market capitalisation defined by total value of issued shares of a firm in market at end of financial year 2011; *SQRTLev* = Square root of leverage equal to the sum of long-term debt and current liabilities of each firm divided by total assets; *ForgnSubs* = Number of foreign subsidiaries divided by total number of subsidiaries; *AuditorSpecialist* = External auditor specialist; *IndustryConDis* = Consumer discretionary industry; *IndustryConStaples* = Consumer staples industry; *IndustryEnergy* = Energy industry; *IndustryHealthCare* = Health care industry; *IndustryIndustrials* = Industrials industry; *IndustryInfoTech* = Information technology industry; *IndustryMaterials* = Materials industry; *IndustryTeleCom* = Telecommunications industry; *IndustryUtilities* = Utilities industry.

7.6 Summary of the Chapter

This chapter has discussed the robustness and sensitivity analyses of the main results in Chapter Six. Related regression analyses were undertaken using alternative measures of dependent, independent and control variables to examine whether or not sensitivity tests supported the main results. In addition, the sample was partitioned using five firm characteristics, and the main regression of Chapter Six was re-run to examine whether partitioning of firms in the sample would have any significant effect on the related dependent variables. Chapter Seven therefore provided some additional analysis to test the stability of the main results in Chapter Six.

Chapter Eight outlines the implications of the results and provides an overall conclusion of this study. The findings of all the hypotheses tests are given followed by the implications, contributions, limitations and summary of the study.

Chapter Eight: Discussion, Implications and Conclusions

8.1 Overview of the Chapter

Chapter Seven discussed the robustness and sensitivity analyses undertaken in relation to the major findings reported in Chapter Six. Alternative measures of continuous dependent and independent variables, and control variables were used to examine whether the main results were sensitive to different measures of variables. In addition, firms in the sample were partitioned based on firm characteristics: firm size, risk, complexity, auditor firm quality and industry to determine whether the main results were differentially influenced by these firm characteristics. In addition, sample partitioning based on the presence and absence of an internal audit function was completed in order to examine the likely impact on corporate governance characteristics and earnings management, respectively. The major findings are incorporated into the discussion that follows.

This chapter discusses the major outcomes of the various analyses and their implications. The findings of all hypotheses are discussed justifying the study's research questions and the contribution that these findings make to the extant literature on internal audit within a corporate context. Additional implications in relation to internal audit outsourcing that were amassed from the survey instrument are discussed. Later in the chapter, contributions of this study from the perspective of different users along with the limitations and suggestions for future research are provided. At the end of the chapter, a final summary of the entire study is provided.

8.2 Study Overview

Since the turn of the current millennium in the aftermath of corporate scandals and various financial crises (including the Global Financial Crisis), internal auditing appears to have gained significant attention as an integral component of the corporate governance mosaic. The empirical research literature highlights the developing role and function of internal audit within the public and private spheres of business (Cooper, Leung and Wong 2006; Goodwin 2003; Carcello, Hermanson and Raghunandan 2005b; Goodwin and Yeo 2001; Abbott, Parker

and Peters 2010; Abbott and Parker 2002). Within a jurisdictional context, Australia has chosen to apply the principles-based approach to governance with respect to its ASX-listed firms. Since its formation in 2002, the ASX Corporate Governance Council (CGC) has released additional editions of its “Corporate Governance Principles and Recommendations” (CGP&R) as well as minor amendments in 2010. The most recent third edition was published in March 2014 and effective from 1 July 2014. In all three editions, the requirement that firms install an internal audit function (IAF) has never been listed as ‘mandatory’. Instead, the provisions provide for flexibility with an “if not, why not” disclosure approach. For example, the second edition (ASX 2007) permits listed companies to avoid the use of an IAF if circumstances justify such a policy decision. However, it is evident that the role of internal audit has altered significantly over the last decade of social and economic changes and that this has affected how the ASX CGC refers to its role and purpose within the private sector.

Under ASX Listing Rule 4.10.3, for example, companies are still required to give reasons for non-compliance in their annual reports, and internal audit continues to be referred to as a significant benefit to the governance process when considering the management of risk and internal controls. These emergent issues acted to motivate this current study and encouraged the desire to determine the current state of affairs with respect to the establishment of internal audit functions (IAFs) in Australian firms and what governance factors (specifically AC and BOD effectiveness) influence the decision. Therefore, the first underpinning objective of this study is to examine the association of AC and BOD effectiveness with the existence of an internal audit function (IAF) for the top 500 ASX-listed companies for the financial year ended 2011. Companies with internal audit may conduct all the internal audit activities in-house or outsource some or all of their activities. This study thus also investigated whether AC and BOD effectiveness influences the decision to undertake internal audit outsourcing (IAO). This relationship has been investigated using a different continuous dependent variable, that is, the extent of internal audit outsourcing (IAO) in lieu of merely investigating its existence per se. Specifically, following on from earlier research studies (Beasley 1996;

Abbott and Parker 2000; Carcello and Neal 2000; Goodwin and Yeo 2001; Raghunandan, Read and Rama 2001; Carcello, Hermanson and Neal 2002; Klein 2002a; Xie, Davidson and DaDalt 2003; Bédard, Chtourou and Courteau 2004; Nicholson and Kiel 2004; Sharma 2004; Carcello, Hermanson and Raghunandan 2005b; Abbott et al. 2007; Barua, Rama and Sharma 2010; Sun and Liu 2012; Abbott and Parker 2002), this study applies three characteristics that underlie audit committee effectiveness and an additional three characteristics underlying board of directors' effectiveness. The association of these characteristics is then tested with the existence of the internal audit function, and the existence and extent of internal audit outsourcing.

As discussed in subsection 2.8.1 of Chapter Two, earnings management is defined as the business practice of using discretionary accruals with the aim of manipulating earnings and associated balance sheet information in order to satisfy questionable ambitions, resulting in information asymmetry and benefiting some stakeholders at the expense of others. Appropriate governance structures and processes should act to limit such activities and it is believed that these include an active relationship between board members (viz., the audit committee [AC]) and the firm's internal auditors. Since the formation of the ASX CGC in 2002, and its growing interest in the role of internal audit in managing risk and internal controls, firms are beginning to expand their governance practices to ensure that such functions are created to allow for effective liaisons to arise.

Prior to the turn of this century, internal audit sections were created with the objective of supporting management and, being more concerned with compliance and financial audit programs, were generally somewhat distant from financial reporting and the verification of company statements. On the other hand, external auditors were viewed as having more direct control over reporting malpractices like earnings management. However, external auditors are now tending to rely more on the services of internal audit as complementary agents supporting their assurance activities (Gramling et al. 2004a; Felix, Gramling and Maletta 2005; Gray and Hunton 2011; Abbott, Parker and Peters 2012; Krishnamoorthy and Maletta 2012).

This evidence, combined with the growing interest in the function of internal audit by the ASX CGC, provided the incentive to structure this research study appropriately. Not only is there an interest in discovering whether internal auditing is emerging as an important governance agency, but also in whether its existence (including in-house and/or outsourcing activities) plays a part in managing questionable practices like earnings management. Furthermore, internal audit quality (IAQ) is used as a variable to test the association with both the existence and extent of internal audit outsourcing (IAO) and earnings management. In this context, it is assumed that corporate decision making (e.g., whether to use earnings management) is a function of its investment in internal audit quality (IAQ). High quality internal audit oversight (as a governance support) would act as a deterrent to using earnings management.

Agency theory is used as the theoretical underpinning for the purposes of this study and is widely applied in corporate governance research (Jensen and Meckling 1976; Shleifer and Vishny 1997; Dalton et al. 1999; Caplan and Kirschenheiter 2000; Daily, Dalton and Cannella Jr 2003). Agency theory has justified the analytical approach of this study and appears relevant given the focus on corporate governance, internal audit as an independent monitoring agent and earnings management. Appropriate hypotheses have been constructed based on the research questions raised in Section 3.3 of Chapter Three and the findings, reported in Chapters Six and Seven, are discussed in detail below.

To formally test the hypotheses, multivariate (logistic and OLS) regression of cross-sectional analysis was postulated depending on the nature of the dependent variable. To test the association of the existence of internal audit and internal audit outsourcing (dependent variables) with AC effectiveness and BOD effectiveness (independent variables), logistic regression was used. Ordinary least squares (OLS) regression was used to test the association of the extent of outsourcing (dependent variable) with the same corporate governance mechanisms (independent variables) as a useful adjunct to the likelihood predictions. Internal audit quality (IAQ) attributes were added as additional independent variables in association

with both the existence and extent of internal audit outsourcing. Subsequently, earnings management was used as a dependent variable and regressed against the existence of internal audit and outsourcing along with the extent of outsourcing (independent variables) using OLS regression analysis. Internal audit quality attributes were also included in the regression as additional independent variables along with internal audit outsourcing to test its association with earnings management.

For the analyses, the top 500 ASX-listed companies from the financial year ended 2011 were selected as the sampling unit or population from which 240 companies were selected. The top 500 were selected based on market capitalisation and in order of largest to smallest in firm size from 1,546 ASX-listed companies after allowing for some exclusions (e.g., financial organisations). This was further discussed in Section 5.2 of Chapter Five. To construct the variables (dependent, independent and control), data were collected from the questionnaire survey, annual reports and data sets (DatAnalysis and FinAnalysis) for the financial year ended 2011. Besides the main analyses, a series of robustness and sensitivity analyses were conducted and the results were reported in Chapter Seven. These results as well as the primary findings of the statistical analysis of the testable hypotheses are summarised and presented in the next section.

8.3 Major Findings of the Study

In this study, all hypotheses were constructed based on a postulated association of internal audit function and internal audit outsourcing with both AC and BOD effectiveness, and earnings management with internal audit function and internal audit outsourcing practices of ASX-listed companies. Some hypotheses were also developed to test the association of earnings management and the practices of internal audit and outsourcing with internal audit quality. Testable hypotheses relating to AC and BOD effectiveness each investigated three aspects, that is, independence, expertise and meeting frequency of the AC and independence, size and duality as characteristics of the board of directors (BOD). The summary of the propositions and related hypotheses and the acceptance and rejection of each hypothesis based

on the statistical analysis conducted in Chapter Six is provided in Appendix B. A detailed discussion of the acceptance and rejection of each hypothesis is subsequently provided in subsections 8.3.1 to 8.3.12 below.

8.3.1 Association of audit committee effectiveness and existence of internal audit function

Of the three individual hypotheses tested under this heading, two of the three predictions were supported. Australian Securities Exchange (ASX)-listed firms with effective audit committees were more likely to be associated with the existence of an internal audit function in the financial year ended 2011. In regard to this hypothesis, three major components of audit committee effectiveness were tested in association with the existence of an internal audit function. The logistic regression results of Table 6.1 in Chapter Six demonstrate that *ACIndep* and *ACMeeting* are significantly positively associated with the existence of an internal audit function (Wald statistics 0.003 and 0.002, respectively). Firstly, a one-unit increase in the percentage of the level of AC independence significantly increases the odds by 38.6% that an ASX-listed firm will employ an internal audit function (IAF). Audit committee (AC) members are entrusted to be more objective in the discharge of their responsibilities, having oversight of the internal auditing processes and providing confidence by a trustworthy and independent evaluation of accounting practices, risk and fraud analysis, and financial reporting (Beasley 1996; Carcello and Neal 2000; Abbott et al. 2003a; Carcello and Neal 2003; Hermanson and Rittenberg 2003; Srinivasan 2005).

Secondly, logistic regression results indicate that a one-unit increase in the number of meetings of the AC during the year increases the odds by 110.5% that an ASX-listed firm will employ an internal audit function (IAF). The IAF works as a supplementary governance mechanism of the audit committee (Institute of Internal Auditors 1993; Scarbrough, Rama and Raghunandan 1998; Goodwin and Yeo 2001; Goodwin 2003; Davidson, Goodwin-Stewart and Kent 2005) and the goals of the AC and IAF are closely connected. It is apparent that frequent meetings of the AC provide opportunities for greater interface with support mechanisms like internal audit, increasing the demand for these services. Sensitivity tests of

the first results are reported in Table 7.2, using alternative measures of *ACIndep* and a re-run the logistic regression. These show that even when considering dichotomous values (a value of 1 if the AC entirely consists of independent members; otherwise, the value is 0), the positive significant influence of independent AC members on the existence of IAF as shown in the main analysis is supported. The robustness tests reported in Tables 7.4 and 7.9 show that partitioning firms in the sample by size and major industry sectors continues to support this positive association of *ACIndep* with the existence of internal audit function (*IAF*). These robustness tests indicate that the significant positive relationship between *ACIndep* and *IAF* is not bounded by larger or smaller firm size or any industry sector specification.

The main logistic regression results of Table 6.1 in Chapter Six also demonstrate that, in relation to Hypothesis H_{1a3}, the number of AC meetings (*ACMeeting*) significantly increases the likelihood that firms employ an internal audit function (IAF). Frequent AC meetings are an indication of the level of diligence of AC members, thus enabling them to gain more knowledge of accounting and auditing issues, effectively reviewing internal audit programs and outcomes and carrying out these responsibilities (Kalbers and Fogarty 1993a; Menon and Williams 1994; Raghunandan, Rama and Scarbrough 1998; Davidson, Goodwin-Stewart and Kent 2005). Audit committee (AC) diligence helps to widen the audit scope (Abbott et al. 2003a; Subramaniam, NG and Carey 2004) further influencing the decision to have an internal audit function (IAF). Therefore, Hypothesis H_{1a3} is accepted. This significant positive association of AC independence and frequency of meetings with the existence of an IAF implies that better corporate governance processes are in place. It follows that frequent interactions with internal audit will likely sensitise AC members in their role as ‘gatekeepers’ when considering their moral responsibility to shareholders. This exposure may act in assisting them to avoid approving reporting strategies that encourage the use of earnings management. This assumed connection is discussed later in this chapter.

Using alternative measures of *ACMeeting* and re-running the logistic regression (refer to Chapter Seven, Table 7.2) show that, after considering the dichotomous values of 1 if the

AC meets at least four times annually, otherwise 0, the positive significant influence that AC meetings have with the existence of the IAF in the original analysis is not supported. Robustness tests reported in Tables 7.4 and 7.9 also show that partitioning firms in the sample by size and major industry sectors does not support the main results but is consistent with the sensitivity test results.

Finally, in contrast, the main empirical results in Table 6.1 in Chapter Six indicate that there is no significant likelihood that the employment of at least one accounting and financial expert member on audit committees will increase the probability that ASX-listed firms will establish an internal audit function (IAF). Therefore, Hypothesis H_{1a2} is rejected.

Results of this study differ from the findings of (Goodwin-Stewart and Kent 2006). Using data from Australian-listed companies for the financial year ended 2000, Goodwin-Stewart and Kent (2006a) suggest that there is no significant association of AC independence and AC meetings with the existence of an internal audit function (IAF). In addition, Goodwin-Stewart and Kent (2006a) suggest that AC expertise is marginally ($p = 0.085$) but negatively associated with the existence of an internal audit function (IAF).

8.3.2 Association of board of directors' effectiveness and existence of internal audit function

Hypothesis H_{1b} (refer to Appendix B for summary) specifies that ASX-listed firms with an effective board of directors (BOD) are more likely to be associated with the existence of an internal audit function (IAF). With regard to this hypothesis, three major components of BOD effectiveness were tested in association with the existence of an internal audit function for the financial year ended 2011. The main results listed in Table 6.2 in Chapter Six demonstrate that two out of three components, namely, *BODSize* and *BODDuality* are significantly more likely to be associated with the existence of an internal audit function (IAF). Specifically, for Hypothesis H_{1b2}, the number of board members appointed is more likely to significantly influence the existence of an internal audit function (IAF). In conjunction with the AC, BODs are accountable for internal control systems by ensuring that accounting and reporting policies are in place and are properly investigated by personnel (i.e., auditors) in accordance with

professional standards (Badawi et al. 2003). Standard boards with 5–9 members have the opportunity to acquire and digest more knowledge, skills and experiences that are necessary for good corporate governance (Van den Berghe and Levrau 2004) and this may influence the decision to establish an internal audit function (IAF). The board of directors (BOD) delegates responsibility for the oversight of the internal control process and financial reporting to the members of the AC, but the impetus to approve the establishment and management of an IAF may originate from this governing entity. In this study, larger boards (Hypothesis H_{1b2}) rather than independent boards (Hypothesis H_{1b1}) are likely to support this initiative. Sensitivity tests, using the alternative measure of *BODSize* and re-running the logistic regression shows (refer to Table 7.3) that when substituting the dichotomous values of 1 (if the BOD consists of 5–9 directors), otherwise 0, the probability outcomes are not supportive of the original finding. However, the robustness tests reported and presented on Table 7.4 show that partitioning firms in the sample by firm size supports this positive association of *BODSize* with existence of the internal audit function (*IAF*). Specifically, the regression results for Hypothesis H_{1b2} report that *BODSize* is significantly associated with *IAF* in both smaller and larger firms and, therefore, firm size is not influencing the positive association of the number of board members with the IAF establishment. Another robustness test presented in Table 7.10 shows that the partitioning of firms in the sample by major industry sectors similarly supports the positive association of board size with IAF existence. Specifically, the number of members on the board significantly and positively influences IAF existence but the latter remains indifferent to whether firms are from major or ‘others’ industry groups.

Sensitivity tests, using the alternative measure of *BODSize* and re-running the logistic regression, show (refer to Table 7.3) that when substituting the dichotomous values of 1 (if the BOD consists of 5–9 directors), otherwise 0, the probability outcomes are not supportive of the original finding. However, the robustness tests reported in Table 7.4 show that partitioning firms in the sample by firm size logically supports this positive association of *BODSize* with the existence of internal audit function (*IAF*). Other robustness tests presented in Table 7.10

show that partitioning firms in the sample by major industry sectors similarly supports the positive association of board size with the existence of internal audit function (IAF). In summary, larger firms require larger boards which, in relation to the top 500 ASX-listed firms, infers the need to employ an independent internal audit function (IAF).

The results reported in Table 6.2 demonstrate that, in considering Hypothesis H_{1b3}, the separation of the role of the board chair from that of the CEO (*BODDual*) has a significant impact on the likelihood that a firm will employ an internal audit function (IAF). Specifically, after the failure of corporate giants (such as Enron, WorldCom and HIH), regulators worldwide (ASX 2003; Cadbury Report 1992; Standards Australia International 2003) recommended the separation of the occupant of the CEO position from the role of chairperson of the board which reduces conflicts of interest. An independent board chair separated from the role of CEO effectively scrutinises managerial behaviour to ensure better internal control and firm performance (Fama and Jensen 1983a). Significant association of *BODDual* with the existence of an IAF therefore implies that the board chair being an independent member facilitates the establishment of an internal audit function (IAF). Therefore, Hypothesis H_{1b3} is accepted.

The role of BOD/AC independence in predicting the likelihood of the existence of an IAF cannot be understated when all factors are evaluated together. In subsection 8.3.1, it is reported that a one-unit increase in the percentage of independent AC members raises the odds by 38.6% (Wald statistic 0.003) that an ASX-listed firm will employ an internal audit function (IAF). The impact of this issue is further strengthened if the findings in relation to overall board independence (refer to Table 6.2) are also brought into account. The logistic regression again supports a positive association with the existence of an internal audit function (IAF) (Wald statistic marginally significant at 0.093). A one-unit increase in the percentage of independent board members increases the likelihood that an ASX-listed firm employs an IAF by 203%.

However, the robustness tests presented in Chapter Seven, Tables 7.4 and 7.10 report that partitioning firms in the sample by firm size indicates that the separation of the role of the CEO from that of the board chairperson only has a significant positive influence on the existence of an IAF in the case of smaller firms (those in the sample ranked 250 to 500). This finding indicates that compared to large firms, smaller firms have more association with the existence of an internal audit function (IAF). Further major industry sector partitioning did not support the significant relationship of *BODDuality* with the existence of an IAF that was shown in the main results. For example, using data for the materials industry sector alone ($n=88$), no findings additional to those reported in the main analysis were discovered. However, the coefficient of another BOD characteristic, *BODDuality*, is positive for larger and smaller firms but statistically significantly only for smaller firms at p -value = 0.019. Therefore, *BODDuality* for smaller ASX-listed firms only significantly influences the existence of an internal audit function (IAF) after partitioning the sample by firm size.

In contrast, the main empirical results in Table 7.2 in Chapter Six indicate that there is no significant association between the percentage of independent directors on the board and the establishment of an internal audit function (IAF). Therefore, Hypothesis H_{1b1} is rejected.

8.3.3 Association of audit committee effectiveness and existence of internal audit outsourcing

The three sub-hypotheses dealing with this issue are summarised in Appendix B. Hypothesis H_{2a} specifies that ASX-listed firms with effective audit committees (AC) are more likely to be associated with the firms engaging into internal audit outsourcing (IAO). With regard to this hypothesis, the three major components of audit committee (AC) effectiveness are again tested in association with the existence of internal audit outsourcing (IAO). The main results provided in Table 6.3 of Chapter Six demonstrate that only *ACIndep* has a significant positive association with internal audit outsourcing (IAO). Specifically, the more independent members (as a percentage) appointed to an audit committee (AC) of an ASX-listed firm, the more likely the firm will be to outsource its internal audit function (IAF). This single finding

is somewhat complementary to those reported earlier. Active audit committees (ACs) not only support the establishment of IAFs but also tend to favour the use of additional outsourcing services.

Based on regulatory reform and given the noted importance of an effective AC in the American Bar Association's Blue Ribbon Committee (1999), Abbott et al. (2007) assert that an effective AC has a significant influence over decisions to outsource. Audit committees (ACs) with a higher percentage of independent members place an emphasis on ensuring higher internal audit quality (IAQ) by outsourcing (Gaynor, McDaniel and Neal 2006; Abbott et al. 2007; Urbancic 1996a) (refer to Table 5.15 in Chapter Five). Survey respondents for this study clearly indicated that outsourcing decisions were most often based on a need for specialist audit skills. Therefore, the expectation of a positive association between *ACIndep* and *IAO* (H_{2a1}) is supported. In Chapter Seven, Table 7.2, a further sensitivity analysis of the data, using the alternative measure of *ACIndep* and a re-run of the logistic regression, shows that, when considering the dichotomous values of 1 if the AC entirely consists of independent members, otherwise 0, the initial positive findings are supported. Unfortunately, the limited size of the sample does not permit any partitioning of the data and so further analysis is not possible.

In contrast, the main empirical results shown in Table 7.2 in Chapter Seven indicate that employing appropriately qualified AC members and holding more frequent AC meetings does not significantly increase the likelihood that ASX-listed firms will outsource their IAF activities. Therefore, Hypotheses H_{2a2} and H_{2a3} are not supported.

8.3.4 Association of board of directors' effectiveness and existence of internal audit outsourcing

The three sub-hypotheses associated with Hypothesis H_{2b} assume that ASX-listed firms with an effective BOD are more likely to be associated with ASX-listed firms engaged in internal audit outsourcing (IAO). With regard to this hypothesis, three major components of BOD effectiveness were tested in association with the existence of internal audit outsourcing. The main results of Table 6.4 in Chapter Six demonstrate that none of the BOD characteristics

(*BODIndep*, *BODSize* or *BODDuality*) has any significant association with internal audit outsourcing (IAO). The issue of independent governance membership appears not to extend beyond the AC committee. Effective boards play a central role in ensuring sound corporate governance and improved firm performance (Lee 2008; Jackling and Johl 2009). Selim and Yiannakas (2000) surmise that a decision to engage in outsourcing will occur only if it results in better internal control and audit quality. Therefore, the assumed expectation that an effective BOD is more likely to be associated with the existence of internal audit function (*IAO*) is overstated, and Hypotheses H_{2b1} , H_{2b2} , H_{2b3} are not supported.

Sensitivity tests of the main result, using alternative measures of *BODIndep* and *BODSize* and a re-run of the logistic regression, are reported in Chapter Seven, Table 7.3. When considering the dichotomous value of 1 if the BOD entirely consists of independent directors, otherwise 0, the original findings are not altered. Furthermore, the alternative measure of *BODSize*, with a dummy value of 1 if the board consists of 5–9 directors, otherwise 0, also fails to identify any significant relationship between variables. The robustness test of data was not performed due to the limited number of firms in the sample.

8.3.5 Association of internal audit quality and existence of internal audit outsourcing

Hypothesis H_{2c} specifies that ASX-listed firms with better quality internal auditing functions are less likely to outsource some or all of their audit activities. It appears reasonable to assume that well-resourced IAFs (i.e., in terms of staff numbers, experience and professionalism, etc.) are less likely to require assistance from external agencies (refer to Section 5.5 of Chapter Five). Only the 60 firms in the sample that had an IAF and provided detailed information on internal audit outsourcing (IAO) and the contents of internal audit quality (IAQ) were considered. Six sub-hypotheses associated with internal audit quality (IAQ) were examined (i.e., refer to Chapter Four, subsection 4.5.3, *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) in the context of internal audit outsourcing (IAO).

Demographic data relating to each of the quality factors forming the independent variables are discussed in subsection 5.3.3 of Chapter Five. For firms identifying the existence of an IAF, the average age of the function was 10.7 years (standard deviation [SD] of 10.4), with a range varying from six months to 50 years. It is apparent that a significant number of firms employed in-house IAF services from the time when it was chiefly viewed as an aid to management. Its direct relevance to the governance process has only become evident during the last 10 years and it is during this time that internal audit outsourcing (IAO) has become popular. The demographic data relating to firms with existing IAFs identify that, on average, they invest \$15.77 million a year on their IAFs, and Chief Audit Executives (CAEs) (or their equivalents) indicated that staff were adequately trained and experienced with most possessing relevant certification. Although the response rate was small (60/240 or 25%), 73% of firms use internal audit outsourcing (IAO) to some extent and its expanding popularity suggests a relationship between internal audit quality (IAQ) and the extent of outsourcing. A further pictorial presentation suggesting this trend is provided in Figure 5.4 of Chapter Five. This shows that outsourcing is more often organised when special audits, management reviews, IT reviews and fraud investigations are deemed necessary.

Regression results for the six tests are shown in Tables 6.3 and 6.4 in Chapter Six and indicate that none of the IAQ variables predicts the likelihood of internal audit outsourcing (IAO). All six quality factors as sub-hypotheses are not supported in the analyses of data from ASX-listed firms. The subsequent sensitivity analysis of the data also fails to provide any further insight into the impact of IAQ on outsourcing. A composite score of *IAQ* ranging from 0–6 (including 0/1 values identifying each of the six quality factors) was used to re-run the logistic regression. Results are shown in Chapter Seven, Tables 7.2 and 7.3, illustrating that no significant relationships were identified. The robustness test of Hypothesis H_{2c} has not been performed due to the limited number of firms in the sample.

It is therefore reported that firms using an IAF do not necessarily outsource because their in-house resources may, in some way, be lacking capacity. Outsourcing appears to be

conducted as special needs arise which are over and above normal requirements. Issues of audit quality are not a necessary condition of these decisions. This matter is again revisited in subsection 8.3.8 below.

Referring to Section 5.5 of Chapter Five, questionnaire respondents from the 44 companies with internal audit outsourcing (IAO) provide insights into the rationale of the outsourcing decision. Of the five rationales given for outsourcing (i.e., being an industry specialist, independent, more cost-effective, flexible and corporate strategy), accessing industry specialist knowledge and expertise from external providers is the most influential reason for outsourcing. In addition, external service providers are considered to be independent and flexible in providing outsourcing services. Therefore, the quality of external service providers is considered influential in the decision making involved in outsourcing.

8.3.6 Association of audit committee effectiveness and extent of internal audit outsourcing

Hypothesis H_{3a} re-examines the association between AC effectiveness and internal audit outsourcing (IAO) but this time using a continuous dependent variable (i.e., extent of outsourcing) instead of the dichotomous probability index (refer to subsection 8.3.3). Hypothesis H_{3a} specifies that ASX-listed firms with effective audit committees (ACs) are more likely to be associated with firms engaging in any respect (i.e., 0–100%) in internal audit outsourcing (IAO). With regard to this hypothesis, three major components of audit committee effectiveness (*ACIndep*, *ACEExpert* and *ACMeeting*) are again tested in association with the extent of internal audit outsourcing. The main results of Table 6.5 in Chapter Six demonstrate that one familiar variable, *ACIndep*, has a significant positive association with the extent of internal audit outsourcing. Specifically, Hypothesis H_{3a1} purports that the incidence of independence within the audit committee (AC) significantly influences the extent of internal audit outsourcing (IAO). As discussed above, regulatory reforms and justification by the American Bar Association's Blue Ribbon Committee (1999) of the need for an effective AC may influence decisions to outsource internal audit activities.

An apparent flow-on affect is noted, in that independent AC membership not only impacts on the decision about whether to employ an IAF but that influence is also seen to impact on the extent of internal audit outsourcing (IAO). Any influence relating to the expertise of AC members and the number of AC meetings per annum was not identified in this instance. Among the top 500 ASX-listed firms, having at least one accounting/financial expert member on the AC and the number of AC meetings per annum have no significant effect on the extent of internal audit outsourcing (IAO). Therefore, Hypotheses H_{3a2} and H_{3a3} are rejected.

Table 7.2 of Chapter Seven records the outcome of sensitivity tests of the data set, using the alternative measure of *ACIndep* and a re-run the OLS regression. Dichotomous values of 1 if the AC consists entirely of independent members, otherwise 0 were used and the findings support the positive significant outcome that the presence of independent AC members influences the extent of internal audit outsourcing (IAO). Again, robustness tests of Hypothesis H_{3a} were not performed (e.g., partitioning the firms by firm characteristics) due to the limited number of firms in the sample.

The notion of independence is one of the few factors found to influence the IA outsourcing decision. The results in this section that shows AC independence is significantly related to the extent of IA outsourcing is reinforced by the result shown in the next section, in that BOD independence is significantly related to the extent of IA outsourcing. One inference is that BOD's with a stronger philosophy of valuing the characteristic of 'independence' will want their AC to comprise of more independent directors. In turn, the BOD and AC will be inclined to favour more independence for the IAF by increasing the increasing the amount of outsourcing.

8.3.7 Association of board of directors' effectiveness and extent of internal audit outsourcing

Hypothesis H_{3b} re-examines the association of BOD effectiveness with internal audit outsourcing (IAO), except that a continuous dependent variable (i.e., extent of internal audit

outsourcing) is used instead of the previous dichotomous variable (refer to subsection 8.3.4). All respondent firms indicated the extent (0–100%) to which they engaged in internal audit outsourcing, providing a more discriminating set of data for analysis. Multivariate predictive analysis (namely, OLS by specification of factors) is substituted for probability analysis. Hypothesis H_{3b} specifies that ASX-listed firms with effective boards can be applied to predict the extent to which firms outsource their internal audit activities. The previous tests associated with Hypothesis H_{2b} (refer to subsection 8.3.4) demonstrate that boards of ASX-listed firms have specific policies that limit their interest in outsourcing per se. However, where outsourcing exists, it is necessary to identify whether the extent of outsourcing is influenced by other broader considerations or issues that the board, rather than the AC itself, is likely to consider.

Figure 8.1 below presents qualitative information on the rationale for outsourcing provided by participating CAEs (or their equivalents) from the returned questionnaires. The x-axis provides the quartile distribution of outsourcing against the number of firms in each block identifying the reasons for outsourcing along the y-axis. The number of firms in the sample that advised the extent of their outsourcing was limited (i.e., 44). Obtaining industry specialist knowledge from service providers and external providers being independent are the most important reasons identified. The spread of all five reasons is fairly equally distributed among the four quartiles of representative data.

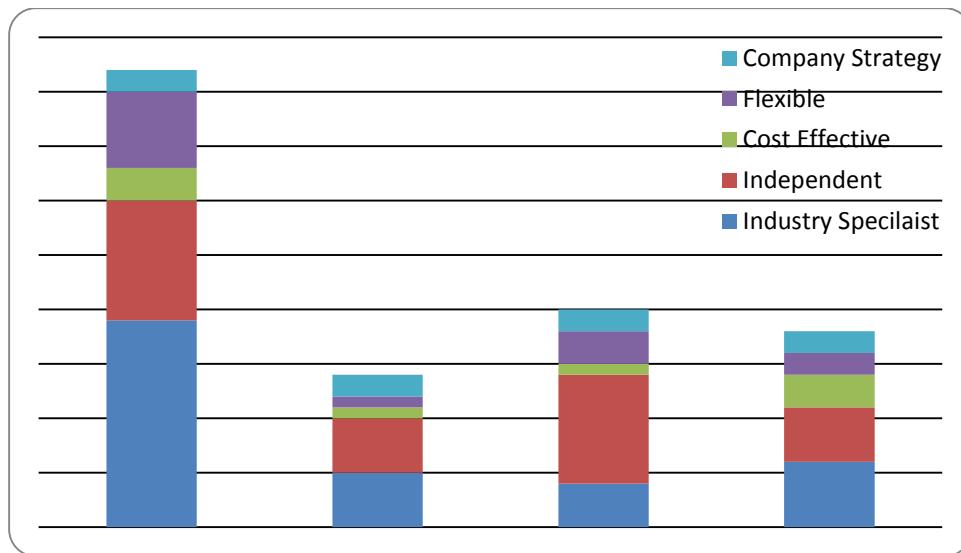


Figure 8.1: Extent of Outsourcing in Relation to the Rationale for Outsourcing

With regard to this hypothesis, three major components of BOD effectiveness (*BODIndep*, *BODSize* and *BODDuality*) are again tested in association with the extent of internal audit outsourcing (*ExtentIAO*). The main results shown on Table 6.6 in Chapter Six demonstrate that none of the three board characteristics has any significant association with the extent of internal audit outsourcing (*ExtentIAO*). Although, according to Selim and Yiannakas (2000), effective boards play a central role to ensure better internal control and audit quality, the main results here do not show any significant association between the variables for this particular financial year ended 2011. Therefore, the sub-hypotheses associated between board independence (*BODIndep*); size (*BODSize*); and duality (*BODDuality*) and *ExtentIAO* cannot be supported.

To analyse the sensitivity of the main results, an alternative measure of *BODIndep* was used and re-run using OLS regression. Table 7.3, Chapter Seven shows that after considering the dichotomous values of 1 if the BOD entirely consists of independent directors, otherwise 0, an outcome is produced that reverses the result reported for Hypothesis H_{3b}, that is, the boards that consist of entirely independent directors significantly influence company decisions in relation to outsourcing.

As a way of clarifying the importance of this association, Figure 8.2 below presents quartile distributions for BOD independence (%) on the x-axis against the existence and non-existence of internal audit outsourcing (IAO) (1, 0) on the y-axis. The only firms in the sample were the 60 that provided information on outsourcing in their returned questionnaires. The pictorial presentation of data illustrates that firms with more independent board members are more likely to engage in internal audit outsourcing. Firms with more than 50% of their board members being independent are engaged in outsourcing more than other firms.

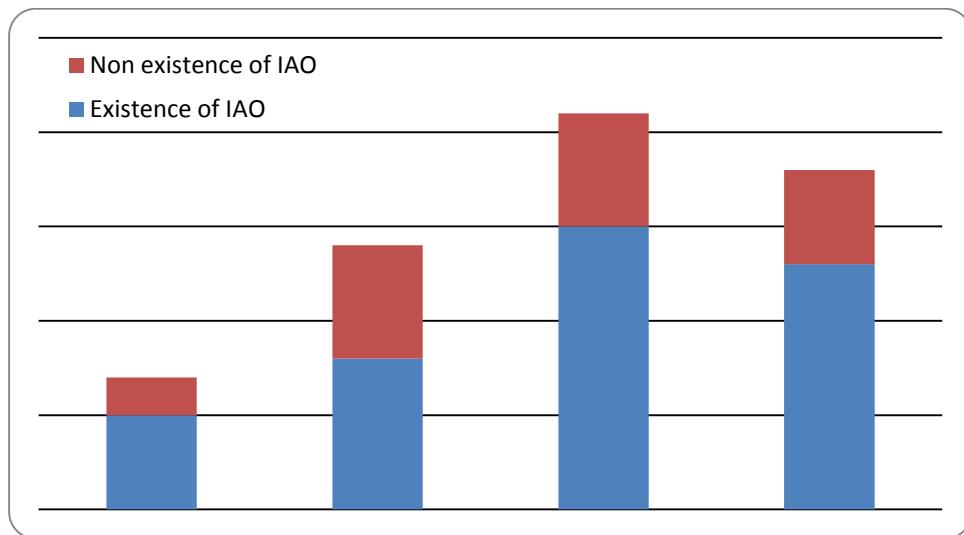


Figure 8.2: BOD Independence in Relation to the Existence of Outsourcing

Using the alternative measure of *BODSize* and re-running the OLS regression for this sub-hypothesis (refer Table 7.3, Chapter Seven), show that when considering the dichotomous values of 1 if the board consists of 5–9 directors, otherwise 0, the main findings that board size does not predict the extent of outsourcing are supported. The robustness test of Hypothesis H_{3b} was not performed due to the limited number of firms in the sample available for analysis.

8.3.8 Association of internal audit quality and extent of internal audit outsourcing

The following comments need to be read in conjunction with those provided in subsection 8.3.5 and the differences noted. Hypothesis H_{3c} specifies that ASX-listed firms with increasing levels of IAQ are less likely to be associated with the extent (0–100%) of internal

audit outsourcing (IAO). The anticipated inverse relationship is a result of the IAF's expected incapacity to provide all necessary/demanded audit services. For example, firms with no IAF may have a greater need to acquire external sources of assistance. The tests were applied to a limited sample of responses from ASX-listed firms and supplement those covered under the heading of Hypothesis H_{2c}, where a dichotomous variable for the existence/non-existence of outsourcing was applied. In that set of tests, none of the six components of IAQ reflected any significant likelihood that ASX-listed firms would be engaged in internal audit outsourcing (IAO). These necessary follow-up tests examine specific predictive capacities of the same components, namely *IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*. The main results of Tables 6.5 and 6.6 in Chapter Six demonstrate that one variable *IAQObject* (auditor objectivity) positively influences the extent of outsourcing in cases of both AC and BOD effectiveness. Specifically, where CAEs (or their equivalents) are reporting to or have direct private access to the AC/BOD, outsourcing of audit activities is predicted to be more often employed. Effective communication between CAEs (or their equivalents) and independent decision makers provides the latter with additional information, which includes an understanding of the imperatives associated with engaging additional audit expertise as required. On this basis, audit objectivity limits information asymmetry, providing additional quality services.

In summary, the identification of a significant association between *IAQObject* and *ExtentIAO* is opposite to that expected in Hypothesis H_{3c5}. Increasing audit quality suggests a greater demand for outsourcing per se. The positive relationship is particularly strong, resulting in a high adjusted R^2 .

The other, rather less related IAQ variables have no independent effect on the extent of outsourcing; however, the results of a subsequent sensitivity test (reported in Tables 7.2 and 7.3 of Chapter Seven) provide additional supporting evidence that quality positively relates to the outsourcing of internal audit services. By constructing a composite score of IAQ factors (ranging from 0–6) and re-running the OLS regression, it becomes apparent that the composite

variable for *IAQ* has a positive significant influence on the extent of IAO. The sensitivity result suggests that an alternative measure of the *IAQ* variable where a single composite score is used positively influences the extent to which firms engage in outsourcing. Therefore, in the main analysis, *IAQObject* is in the sensitivity analysis, and a composite score for *IAQ* produces interesting findings. The robustness tests for Hypothesis H_{3c} have not been conducted due to a limited number of firms in the sample.

In summary, an OLS regression analysis of internal audit outsourcing (IAO), using the limited 2011 data for ASX firms, suggests that higher levels (rather than lower levels) of IAQ equate with an increase in outsourcing. It appears that BOD and AC members are likely to recognise the importance of supplementing existing IAF resources with external support as needed. It is clearly apparent from the demographic data reported above that governing bodies tend to be influenced more by quality IAF services and respond, not by reducing the need for outsourcing, but actually expanding its use as an effective resource benefiting the organisational objectives.

8.3.9 Association of existence of internal audit function with discretionary accruals

Recent scandals involving inappropriate accounting practices (e.g., Enron, WorldCom, HealthSouth, Qwest, Rite Aid, Tyco, Waste Management Inc. and Xerox) have gained the attention of practitioners, regulators and academics regarding the role of audit in true and fair financial reporting (Prawitt, Smith and Wood 2009). External auditing standards like those of AICPA (1991) and PCAOB (2007) explicitly recognise the importance of audit in the financial reporting process and now require or encourage the existence of an internal audit function (IAF) (Harrington 2004; NYSE 2002). The empirical studies (for example, Eighme and Cashell 2002; Martin et al. 2002; Rezaee 2002; Schwartz and Young 2002; Clikeman 2003; Hala 2003; Rogers and Stocken 2005) have also emphasised the changing nature of internal audit. In Australia, the recent ASX CGC's CGP&R (2014) also strongly recommends that listed companies establish an internal audit function (IAF). As was discussed at the commencement of this study, internal audit has long been viewed as a necessary aid to

management. The need for an independent oversight was important, but just as important was the need for a support agency that also assisted in developing an efficient and effective business enterprise, not only acting to deter fraud and mismanagement, but also adding value in a significant manner. During the last decade, in particular, an independent IAF is now being seen to directly input into the governance process, while continuing to serve management. This rise in strategic importance for internal audit would be expected to both impact on a firm's economic performance but also act as an effective deterrent of financial mismanagement as the governance body becomes more sensitive to the need for true and fair reporting. The exploratory empirical analyses conducted and reported here are an attempt to gauge the influence of the role of internal audit on reporting and, in this instance, on the incidence of earnings management. Discretionary accruals are used as the proxy for estimating the use of earnings management by the top 500 ASX-listed firms.

Hypothesis H₄ specifies that ASX-listed firms with internal audit functions (IAFs) are negatively disposed to be associated with using discretionary accruals (DAC). With regard to this hypothesis, the existence of internal audit (*IAF*) is used as dichotomous independent variable with a value of 1 if internal audit exists within the company, otherwise 0, and is examined in association with discretionary accruals (*DAC*). The main results of Table 6.7 in Chapter Six demonstrate that *IAF* has an insignificant negative association with *DAC*, while the analysis shows that other control factors (e.g., firm size, complexity and industry sector) have a significant influence on the use of discretionary accruals (*DAC*).

This result implies that, although internal audit is considered as one of the important corporate governance mechanisms, along with the audit committee (AC), board of directors (BOD) and external audit (IIA 2005a), the existence of internal audit does not influence discretionary accruals (DAC) for the representative sample used in this study. Some of the earlier research (Schwartz and Young 2002; Rogers and Stocken 2005; Hunton, Libby and Mazza 2006; Brown and Pinello 2007; Asare, Davidson and Gramling 2008) reports the importance of an IAF on management's aggressive financial reporting, but the result of this

study is consistent with that of Davidson, Goodwin-Stewart and Kent (2005). Davidson, Goodwin-Stewart and Kent (2005) investigated the same association of the establishment of the internal audit function (IAF) with earnings management in the Australian context. Using 434 ASX-listed firms for the financial year ended 2000, Davidson, Goodwin-Stewart and Kent (2005) reported that the establishment of internal and external audit is not significantly related to a reduction in the level of earnings management.

To analyse the sensitivity of the main findings, with alternative measures of *DAC*, the OLS regression was re-run and reported in Chapter Seven, Table 7.1. This finding suggests that even considering alternative measures of *DAC*, (i.e., the performance-matched modified Jones model [PMMJM]) does not support the hypothesis which is still consistent with the main result. The robustness tests in Chapter Seven, Table 7.5 report that partitioning firms in the sample into larger (top 250) and smaller (from top 250 down to 500) firms also shows an insignificant negative influence of the existence of internal audit function (IAF) on *DAC*. Further robustness tests in Tables 7.6 to 7.8, with firms in the sample partitioned by firm risk (*SQRTLev*), complexity (*ForgnSubs*) and auditor firm quality (*AuditorSpecialist*), do not show any significant associations between *IAF* and *DAC*.

With firms in the sample partitioned by major and ‘others’ industry groups, another robustness test in Table 7.11 clearly supports the main results, reporting that the existence of internal audit function (IAF) is not significantly associated with the reduction of discretionary accruals even after partitioning the sample by industry group. Interestingly, Table 7.11 shows that firms in the industrials industry sector are less likely to engage in earnings management compared to the largest materials industry sector representatives. However, none of the major groupings, when examined independently, demonstrate any significant relationship with the existence of internal audit function (IAF). Thus, for the top 500 ASX firms listed during the financial year ended 2011, the existence of an IAF does not significantly influence the use of discretionary accruals (DAC).

8.3.10 Association of existence of internal audit outsourcing with discretionary accruals

Outsourcing is a relatively new phenomenon in internal audit practice. Through outsourcing, firms can avail themselves of specialised knowledge and skills thus helping to increase overall audit quality (Prawitt, Smith and Wood 2009). High quality internal auditors work as an additional third party to monitor management actions and detect fraudulent financial reporting. This exploratory study therefore expected to demonstrate that discretionary accruals may be negatively influenced by the decisions to outsource the internal audit (Hypothesis H₅).

Hypothesis H₅ specifies that ASX-listed firms with internal audit outsourcing are less likely to undertake discretionary accruals in the financial year ended 2011. With regard to this hypothesis, the existence of internal audit outsourcing (*IAO*) is used as a dichotomous independent variable with a value of 1 if the firm is engaged with any internal audit outsourcing, otherwise 0, and is examined in association with discretionary accruals (*DAC*). In the analysis, 60 firms in the sample confirmed the use or non-use of outsourcing. The main results as shown on Table 6.8 in Chapter Six demonstrate that *IAO* has an insignificant negative association with *DAC* and therefore Hypothesis H₅ is rejected. Qualitative responses from the questionnaire survey indicated that the most significant reasons for outsourcing are accessing industry specialist knowledge from external providers and the expectation of external providers being independent and flexible. As discussed in Chapter Two, Section 2.4, outsourcing influences the quality of the internal audit function (IAF): this study expected that outsourcing would add quality to the internal audit function (IAF) and would be less likely to influence earnings management which is rejected in the main analysis.

To analyse the sensitivity of the main result, alternative measures of *DAC* were used and the OLS regression was re-run. The results (refer to Chapter Seven, Table 7.1) show that even considering alternative measures of *DAC*, that is, the performance-matched modified Jones model (PMMJM), does not support the hypothesis and this is still consistent with the

main finding. Partitioning the sample by firm characteristics for the robustness tests was not possible due to the limited size of the sample.

8.3.11 Association of extent of internal audit outsourcing with discretionary accruals

Hypothesis H₆ aimed to re-examine the association of the extent of internal audit outsourcing (*ExtentIAO*) (rather than examining its existence) with discretionary accruals (*DAC*). Hypothesis H₆ specifies that there is a negative association between the degree of outsourcing undertaken by ASX-listed firms and the extent to which they apply earnings management. The main results, shown on Table 6.9 in Chapter Six, demonstrate that the extent of internal audit outsourcing (*ExtentIAO*) has an insignificant negative association with discretionary accruals (*DAC*). Therefore, the expectation of a significant association between *ExtentIAO* and *DAC* is rejected for Hypothesis H₆. A sensitivity analysis of the main finding, using alternative measures of *DAC* and re-running the OLS regression, was conducted and the results are shown in Chapter Seven, Table 7.1. The performance-matched modified Jones model (PMMJM) does not change the results in regard to connecting outsourcing with discretionary accruals. Robustness tests for Hypothesis H₆ were not performed due to the limited number of firms in the sample.

At this point, it is clear that neither the existence of an IAF nor the firm's use of internal audit outsourcing have any significant influence on the application of discretionary accruals by ASX-listed firms for the financial year ended 2011. These outcomes were somewhat predicted in the bivariate correlations reported in Chapter Five (Tables 5.9, 5.10 and 5.11) for the sample data. There were no significant relationships between any of the governance and IAF quality variables, including the existence of quality. However, negative correlations were noted in respect to more complex firms, with those that reported the existence of foreign subsidiaries and/or that also made use of specialist external auditors, were less likely to apply earnings management in their financial reports for the financial year ended 2011.

8.3.12 Association of internal audit quality with discretionary accruals

Hypothesis H₇ specifies that there should be a negative association between internal audit quality and earnings management. Prawitt, Smith and Wood (2009) implied this relationship when they remarked that internal audit expressed its quality in terms of the way it monitored management activities and facilitated the detection of fraudulent financial reporting. Internal auditors ensure the quality aspect and are proactive in their ambitions to reduce questionable earnings management practices (Clikeman 2003). Eighme and Cashell (2002) and Schneider and Wilner (1990) further surmised the role of internal audit in detecting inappropriate earnings management as being complementary to that of external audit. Each of these findings connect internal audit processes with quality and are likely to be associated with management reporting practices, in particular the use of discretionary accruals (DAC). The empirical tests conducted as part of this research aimed to verify these statements in relation to the activities of ASX-listed firms.

With regard to this hypothesis, six major IAQ variables (*IAQCert*, *IAQExperi*, *IAQSize*, *IAQTrain*, *IAQObject* and *IAQTimeFin*) were tested in association with *DAC*. The main results shown on Tables 6.8 and 6.9 in Chapter Six indicate any significant associations of IAQ with *DAC*. The results show that none of the IAQ variables has any significant association with discretionary accruals (DAC) in the case of both *IAO* and *ExtentIAO*; therefore (*IAQCert*) H_{7a}; (*IAQExperi*) H_{7b}; (*IAQSize*) H_{7c}; (*IAQTrain*) H_{7d}; (*IAQObject*) H_{7e} and (*IAQTimeFin*) H_{7f} are rejected. The main empirical results are not consistent with the prior literature that suggests the link of internal audit quality and the existence of IAF with earnings management. The small sample size of 60 is likely to be the chief reason why there are no significant findings in this instance. To analyse the sensitivity of the main findings, alternative measures of *DAC* were applied and the OLS regression repeated. Table 7.1 of Chapter Seven shows that using the performance-matched modified Jones model (PMMJM) does not show any significant influence between IAQ variables and discretionary accruals. Robustness tests for Hypothesis

H_7 were not performed: partitioning firms in the sample by firm/industry characteristics would involve small sample sizes so these tests were not conducted.

8.4 Implications of the Study

As mentioned in the introduction to this study, the research approach is both exploratory and confirmatory. It is confirmatory in the sense that it involves a re-evaluation of historical influences (regulatory and anecdotal) that would suggest a growing utilisation of internal audit functions (IAFs) within ASX-listed firms. Prior research consists of only one study that was conducted using data from the year 2000. There is clear evidence that utilisation of this resource (i.e., internal audit) has not altered significantly; however, changing governance profiles appear to be having some effect.

The chief governance issues affecting the likely existence of an IAF relate to growing reliance on the employment of independent board directors and AC members. This exploratory component of the study indicates that ASX-listed firms that have more independent AC members and who meet more frequently during the financial year are more likely to be associated with the existence of an internal audit function (IAF). These findings support the expectations of regulatory bodies, such as the ASX CGC, which are encouraging greater utilisation of these resources.

A significant exploratory component of this study has been concerned with the quality of internal audit services. From the prior literature which is mainly qualitative, quality is viewed as pivotal when considering the development of internal audit as an active function of governance (e.g., Porter 2009), including viewing internal audit as part of an “audit trinity”, a formula for success when managing risk and internal controls. Detailed responses related to these issues were obtained from 60 ASX-listed firms (25% of the sample used to identify the existence of an IAF), providing the basis for testing relationships between associated variables, for determining the extent to which they were impacted by governance issues and examining their influence on earnings management.

Both the limited size of the sample as well as the exploratory nature of the research limited the findings, in terms of the stated hypotheses. However, some significant outcomes are reported, which have significant implications. Perhaps the most valuable relate to issues associated with outsourcing. A lot of space was given in this study to examining this emergent area of auditing activity (refer to Chapter Five, Section 5.5) and the hypotheses were structured to test connections both to governance and audit quality. Firstly, as anticipated, independent audit committees (ACs) are associated with the existence and extent of internal audit outsourcing (IAO). And, secondly (contrary to expectations), the quality of the IAF is directly associated with outsourcing. Outsourcing is not a substitute for poor performance in this area but rather a complement to good performance. The likelihood of outsourcing mainly specialised functions is further encouraged when the CAEs (or their equivalents) have direct private access to AC personnel.

Although the past literature alludes to the potential for an association between the existence of an IAF existence and quality (including outsourcing) and financial reporting quality, the results involving the incidence of earnings management proved elusive. None of the variables (other financial control variables) confirmed any association with earnings management and it is believed external auditing quality is still the chief deterrent to these forms of reporting behaviour.

All the implications of the findings are discussed in the following subsections in relation to key stakeholders of the firms (e.g., regulators, investors, scholars, corporate management).

8.4.1 Regulators concerned with good governance

The role of internal audit has evolved from a narrow financial and operational audit focus to a broader value-added role in order to provide assurance and consulting services, and to generally improve internal controls, risk management and corporate governance (Krogstad, Ridley and Rittenberg 1999; Brody and Lowe 2000b; Walker, Shenkir and Barton 2003b; Goodwin 2004; Goodwin-Stewart and Kent 2006; Dessalegn Getie and Aderajew Wondim

2007). Internal audit is also involved in controlling the risk associated with fraudulent financial reporting (Goodwin-Stewart and Kent 2006a). With the extended value-added role of internal audit, it has been promoted as a cornerstone of effective corporate governance that improves the quality of information for decision-making purposes (Institute of Internal Auditors (IIA) Professional Guidance 2002). Internal audit evaluates and improves the governance process in association with the audit committee (AC) and board of directors (BOD) (IIA 1999; Ramamoorti 2003; Ruud 2003; IIA 2004). Regulators agree on the need to strengthen the role of internal audit as an integral part of the internal governance and control process of a company (SEC 2002, 2004; SOX 2002; ASX 2007). In consideration of the significant changes in the role of internal audit, regulators in Australia have made strong recommendations but fall short of mandating the establishment of internal audit functions (IAFs) (ASX 2003; 2007; 2014). The importance of the IAF is however emphasised in the latest 2014 (3rd) edition of ASX CGC's guidelines and recommendations for listed companies. The new Recommendation 7.3 states that listed companies should disclose the existence of an IAF along with the structures and roles of the function. In addition, listed companies also need to disclose how they ensure effective risk management and internal control processes if they do not have an internal audit function (IAF).

The above-mentioned reports and recommendations fit well with the major findings of the current research. Factors that have major influence on the establishment of internal audit as well as on the use of outsourcing are independence-related. Independent AC membership, combined with frequent meetings act as antecedents for the application of internal audit services. Once established, the use of outsourcing is also connected to the relationships that the CAEs (or their equivalents) are forging with members of the board of directors (BOD) and/or audit committee (AC). At the same time, outsourcing is seen as complementing existing audit services rather than substituting for them. The internal and external contributions add value in this context.

Is there a case to argue that regulators ought to mandate the establishment of an internal audit function (IAF)? This is a difficult question to answer given the findings of this research. Certainly many firms are continuing to avoid this action believing that other factors (e.g., management of internal controls) are adequate and that risk management departments or functions satisfy the informational demands of governance members. Given the data analysis of IAF operations, it appears that the majority of departments have existed for over 10 years and that the board and AC are beginning to make use of their independent services. Where IAFs exist, it is likely that, in their day-to-day activities, they continue to consider the needs of management as much if not more than they do the interests of governance members. Independence of appearance is important, but somewhat secondary to providing direct input to business situations that need remedial intervention as soon as they arise, which is commonplace practice within internal audit. In such situations, independence of mind takes precedence. Firms with long established IAFs are likely to take these audit interventions as useful engagements that they welcome and do not need to be forced to accept, should IAFs be regulated by external authorities.

Where IAFs do not appear to exist (in almost half the top 500 ASX-listed firms), then it could be construed that as long as other mechanisms apply (e.g., control groups, risk management departments, etc.) then firms have the option to rely on these alternatives and regulatory interventions are unnecessary. However, the findings of this research suggest it will be only a matter of time before discrete IAFs will become standard practice as the presence of independent governance appointments continues to reduce information asymmetry.

With respect to financial reporting, this study provides additional insights to the regulators that IAFs and outsourcing are not necessarily the appropriate mechanism to manage fraudulent and false financial reporting per se. The process of intervention is via an informed and independent governance body, aided by periodic external audit oversight. Regulators therefore need to emphasise other mechanisms (e.g. external audit) to lessen the practice of earnings management.

8.4.2 Investors

Investors require proper and reliable information to estimate the true value of a firm's shares in the process of making economic decisions. Establishment of internal audit and outsourcing practices facilitates value-added assurance and consulting services and improves internal control, risk management, better financial reporting and effective corporate governance. The establishment of internal audit will aid internal and external stakeholders reducing the information gap and help to determine market values that relate more appropriately to net worth. The fundamental purpose of external audit is to add credibility in financial reporting. However, its credibility will depend heavily on internal audit input in order to fulfil the ambition to protect all investor interests. Both in the establishment of internal audit and in the existence/extent of outsourcing, it is believed that this research confirms a link between both forms of service and the ambitions of the governance process. This supports Porter's (2009) notion of the "audit trinity" (AC, internal audit and external audit) to ensure the cooperation of key independent functions. All these factors work to provide more credible financial information to investors.

Earnings management and reporting misleading financial information are also important concerns to investors. Although the findings of this study suggest that internal audit is not directly related to the practice of earnings management by ASX-listed firms, the IAF works in cooperation with the other members of the "trinity" to ensure quality outcomes. For example, external audit may be better placed to identify the excessive or unethical use of earnings management as part of its assurance contract. However, its judgments draw on the extent to which it can rely on internal audit services. Evidence of a good internal audit–AC relationship would act to reduce the level of inherent risk in this area.

This study provides additional information to investors that firms with higher amounts of leverage experience more risk and tend to provide fraudulent financial information.

Furthermore, engaging a specialised audit firm can reduce the possibility of earnings management. Therefore, investors could believe that firms with less risk and a specialised auditor are more likely to report true financial information without earnings management.

8.4.3 Scholarly research

Given the importance of internal audit functions (IAFs) within corporate governance structures, scholars have worked on various dimensions (e.g. determinants, size, etc.) of internal audit. This study has linked internal audit with two other mechanisms and investigated whether AC and BOD attributes contribute to the existence of an internal audit function (IAF). The results of this study indicate that AC and BOD attributes have an influence and that independence issues in particular provide the greatest impetus. This study provides a perspective from Australia where the establishment of an IAF is still not mandatory. Scholars would find this research useful when comparing the effect of governance on performance in other jurisdictional regimes, like the USA, where the law dictates how firms structure their management.

Furthermore, this study has reported a new link of the AC and BOD with internal audit outsourcing (IAO) which is a common phenomenon in public accounting practices. Australia is a different institutional environment because outsourcing to the firm's external auditor is not restricted. Thus, scholars can gain a better understanding about how boards and ACs influence the extent of outsourcing in conjunction with existing internal audit functions (IAFs). External audit is more connected with earnings management in terms of providing better quality financial reporting. Although this study fails to establish an association of internal audit and outsourcing with reducing earnings management practices, it provides some important insights relating to characteristics that influence financial reporting as it affects ASX-listed firms. Since the IAF is associated with the AC and BOD, this implies an indirect link with effective financial reporting. This study thus provides additional information on earnings management and internal audit practices.

8.4.4 Corporate management

This study uses agency theory as the theoretical framework which assumes that owing to issues of information asymmetry between the principal (owner) and agent (management), the agency cost increases and therefore the agent may act in their own self-interest and not properly consider the best interests of the principal, that is, the shareholders (Abbott and Parker 2000; Cohen, Krishnamoorthy and Wright 2004; Carcello, Hermanson and Raghunandan 2005b). Principals therefore rely on the important mechanisms of the firm that aim to provide value-added assurance and consulting services in order to control internal structures and monitor financial reporting. As discussed in this thesis, the IAF is an important corporate governance mechanism that works in association with the AC and BOD to provide better internal controls. Establishment of internal audit also provides additional assurance to the external auditor about financial information quality. Internal audit monitors and reviews the financial information produced by management and the external auditor. Internal audit works as an additional party in terms of investigating the information and assuring its quality. This three-way “Trinity” mechanism acts to benefit external beneficiaries.

Within agency theory, management, including its numerous personnel, are potential adversaries that need to be carefully monitored and controlled. There is little space for a cooperative effort that includes management in this context. To this extent, the theory is limiting and ignores the significant contributions management personnel make towards achieving financial goals in an effective and efficient manner. Remuneration levels are poor indicators of productivity which also depends on the quality of personal/interpersonal relationships, esprit de corps and trust that can be better associated with stewardship theory (Davis, Schoorman and Donaldson 1997). This may explain the high incidence of firms that continue not to use an IAF and may well explain the incidence of lack of independence at the board chair and membership level as noted in this study.

8.5 Major Contributions of the Study

Prior research (Goodwin 2004; Carcello, Hermanson and Raghunandan 2005b; Carcello, Hermanson and Raghunandan 2005a; Christopher, Sarens and Leung 2009; Sarens and Abdolmohammadi 2011; Anderson et al. 2012) has discussed various dimensions, for example, factors associated with internal audit function size and investment, and comparative analysis of the state of the internal audit function (IAF) between private and public companies of Australia and New Zealand. Very few studies specifically investigate the determinants of the presence of the internal audit function (IAF) per se (for example, Wallace and Kreutzfeldt 1991; Carey, Simnett and Tanewski 2000; Goodwin-Stewart and Kent 2006). This study contributes by exploring the influences of two important corporate governance mechanisms (the AC and BOD) on the existence of the internal audit function (IAF). The main results of this study report that effective ACs and BODs influence the decision to employ an IAF, which facilitates risk management, and improves internal control and corporate governance management. By focusing on multiple attributes of the AC and BOD, this study provides a deeper understanding of the importance of these oversight bodies, and the extent to which corporate governance mechanisms effect the establishment of an internal audit function (IAF).

This study also contributes by addressing internal audit outsourcing (IAO) and relating this to AC and BOD effectiveness. As internal audit outsourcing (IAO) is gaining more attention in terms of providing specialised quality internal audit services in a cost-effective manner, the specific board and IAF attributes influence both the existence and extent of internal audit outsourcing (IAO). Corporate management bodies, regulators and auditors can use this information about the specific determinants of outsourcing and apply these determinants in decision making.

This study also contributes by providing insights as to how internal audit influences financial reporting. Although external auditing is more closely connected with financial reporting, internal audit can also work as an additional party to both deter and detect misrepresentations within the governance framework. Therefore, the findings of this research

will help Australian regulators to determine whether internal audit practices are more likely to improve financial reporting quality.

This study provides an additional insight on internal audit quality (IAQ) and its influence on outsourcing practices and earnings management, an area that has not been previously examined with any empirical rigour. Reviewing the main results, this study reports that internal audit quality (IAQ) has a positive influence on the decision to outsource when it aims to improve overall audit quality.

The top 500 ASX-listed firms are considered as the population unit for the current study which relies on a combination of primary and secondary data. Despite the ASX CGC strongly recommending that listed firms establish an IAF, it is evident from this study that close to one-half of these firms have ignored this request. This study has therefore provided insights into how the recommendations influence company boards, many of which for whatever reason continue to rely on alternative sources of assistance in reaching their goals to manage risk and internal controls.

The internal audit function (IAF) is voluntary in Australia and follows an “if not, why not” reporting process. The ASX CGC has implemented three editions of the CGP&R since 2002 stating the practices (including the employment of an IAF) that help to ensure better corporate governance for ASX-listed firms. Moreover, unlike the USA, internal audit outsourcing (IAO) to the firm’s external auditors is not restricted in Australia. In all three editions of the CGP&R, the establishment of an IAF is strongly recommended for large listed companies and it is recommended that the external auditor be independent in terms of providing outsourcing services. In this context, this study is useful in that it investigates the extent to which the top ASX-listed firms follow these principles and recommendations.

This study is significant in that it involves a cross-sectional analysis of recent financial data in order to investigate the research questions. The study is the first to examine specific governance practices post-Enron and the recent financial crises (including the Global Financial Crisis). Such empirical studies are also rare in the sense that only one (Goodwin-Stewart and

Kent 2006a) has examined factors influencing IAF existence and one (Davidson, Goodwin-Stewart and Kent 2005) has been involved in examining governance factors that influence earnings management and these both used data from the year 2000. Since that time, the ASX equity turnover has increased by a factor of two and the number of listed firms has increased to 1,950 domestic registrations in December 2013, a growth of approximately 40% (ASX Historic Market Statistics 2013).

Overall, this study provides important insights and highlights avenues for key stakeholders, policy makers and regulators to determine the effectiveness of legislation introduced to improve the corporate governance structure and financial reporting. Within a positivist empirical mode, this study provides important insights for future research but not without the following caveats.

8.6 Limitations of the Study

While this study has some major contributions, this is not without limitations. For example, AC and BOD effectiveness is a multi-dimensional construct and there is no specific and precise definition of AC and BOD effectiveness. These two corporate governance mechanisms have immense influence on the decision to engage an internal audit function (IAF) and whether or not to outsource. As this study has considered only three common attributes of each mechanism in line with the prior literature (for example, Jensen 1993; Beasley 1996; Abbott and Parker 2000; Carcello and Neal 2000; DeZoort and Salterio 2001a; Abbott et al. 2003a; Carcello and Neal 2003; Davidson, Goodwin-Stewart and Kent 2005; Abbott et al. 2007; Jackling and Johl 2009; Kiel and Nicholson 2003), it ignores other attributes that might have important influences that have not been considered in this study. For example, how might the employment of a risk management committee substitute or even replace the role of internal audit? This is therefore considered as a limitation of this study.

As with AC and BOD effectiveness, internal audit quality (IAQ) is measured in line with Prawitt, Smith and Wood (2009) and based on US external auditing standards (AICPA 1991; PCAOB 2007). Internal audit quality is measured using six attributes. These proxy

measures are not entirely exclusive and ignore such issues as the extent to which existing IAFs undertake peer review or arrange independent evaluations of performance.

This study has used a combination of primary and secondary data to measure the variables. Data on AC and BOD effectiveness and control variables are collected from annual reports which limits the amount and type of data and may contain false or incomplete information. Furthermore, questionnaire survey data also raise questions of truthfulness and completeness of information provided by respondents. The findings of this study are therefore dependent on the truthfulness and accuracy of the information presented in annual reports and in the questionnaire survey and this is considered as a limitation of this study.

Only 60 ASX-listed firms provided fully completed usable questionnaires which severely limited the extent and nature of tests that could be conducted in relation to outsourcing and earnings management. The small sample limited the analysis of whether AC and BOD effectiveness, and earnings management along with internal audit quality (IAQ) influence the decision about the existence and extent of internal audit outsourcing (IAO) and is considered as a limitation of this study. Data on the existence and extent of internal audit outsourcing (IAO) and internal audit quality (IAQ) were collected only from the questionnaire which again restricted the depth of analysis. Moreover, this study has not tested whether different industry sectors have any influence on outsourcing owing to the limited number of the sample. From the analysis of the 240 firms in the initial test sample, it was apparent that firms in the materials and industrials industry sectors were engaged in different arrangements in relation to the existence of internal audit.

This study has concentrated only on the recent state of internal audit practices (in-house and outsourced) in the top 500 Australian ASX-listed companies. Therefore the findings of this study are not generalisable to include non-listed (private) Australian firms, or the whole range (small and large rankings) of Australian-listed firms or publicly-listed firms of other countries (e.g., the USA, UK) within different institutional settings. Furthermore, this study

has only used data from the financial year ended 2011 instead of a time span of say three or five years, with this another limitation of the study.

This study used primary and secondary data to measure the existence of internal audit functions (IAFs). Out of the top 500 ASX-listed firms, only 111 respondents provided information on the status of the IAF within their company. It was necessary to increase the ‘status’ sample by examining the financial reports of a further random group from the top 500 firms. Assumptions had to be made based on the content or lack of content provided in the reports.

Finally, It would have been useful to review what external auditors had to say about the quality of existing internal audit functions (IAFs) and the extent to which they would specifically rely on their assistance when planning financial audits. This would, however, have been an arduous task and auditors may be reticent to provide confidential information relating to client engagements.

8.7 Suggestions for Future Research

The empirical findings and limitations of this study provide some avenues for future research. For example, future research can use different attributes to measure AC and BOD effectiveness (e.g., AC size, AC interaction with the IAF, AC corporate governance experience, BOD meetings, gender of membership, etc.). The findings of this study report that some attributes of the AC and BOD have significant influences on internal audit practices including the existence of the IAF and outsourcing and even to what extent outsourcing is undertaken. Therefore, exploring additional attributes would provide a deeper understanding of the attributes influencing the decision to establish an internal audit function (IAF).

By extending the sample size, a study could be conducted that could also explore the state of internal audit practices in Australia in a broader context. Rather than using only the top 500 ASX-listed firms, all the listed firms could be considered, or the study could include a comparative analysis taking into consideration private and public Australian companies. In

addition, the scope of primary data collection could be extended to include further information on the IAF, outsourcing and internal audit quality which is not available in annual reports.

Longitudinal studies including lagged financial data might result in better findings. Moreover, the recent ASX CGC's CGP&R (2013) applicable from March 2014 will provide a better insight into internal audit and corporate governance practices in Australia in future times and deserves to be studied. A different time span of 2011–2015 could be fruitful in this context and show the pre- and post-stages of the comprehensive understanding of ASX principles and recommendations on corporate governance.

This research was underpinned by agency theory which strongly influenced the modus operandi (e.g., concentration on governance issues). Had stewardship theory been used, then it may have resulted in totally different findings. For example, it may be discovered that many firms with an IAF have had the function established for long periods of time and that much of the firm's success was the result of very good working relationships with management, producing outcomes that are founded more on joint cooperative effort and good relationships. This may also affect the extent to which outsourcing was undertaken.

A further analysis of firms within the industrials industry sector also deserves attention; however, the relatively small sample size in this study restricts any significant research.

Finally, this study has considered a single nation (i.e., Australia) to evaluate internal audit practices in association with corporate governance mechanisms and the influence of internal audit on earnings management. It is therefore logical to extend future research using another broader international setting. Scholars could conduct research related to this study by selecting countries with different institutional settings (e.g., the USA, UK, etc.).

8.8 Summary of the Study

This empirical study provides important insights into the relationship of corporate governance mechanisms with internal audit practices. Regulators and scholars in Australia tend to favour the establishment of internal audit functions (IAFs) using the facility of in-house and outsourcing. Findings of this study report important insights into the current state of

internal audit in Australia and the outsourcing practices of top ASX-listed firms. This study also provides important insights into key corporate governance mechanisms of the AC and BOD that have a significant influence on the decision whether or not to employ internal audit and use outsourcing. This could be of value to regulators and capital market investors in improving overall corporate governance processes. The emphasis appears to be one that favours internal audit becoming an instrument of governance and to inevitably deny any historical allegiances that it has to management.

It is believed that this study makes a useful contribution to the body of governance literature generally and specifically. More and more studies are beginning to closely analyse the emergence of internal audit as a major entity in its own right, strongly influencing how business decisions are made. It is inconceivable that the IAF will ever be totally outsourced as a general practice. Certainly, it will always be necessary to employ external expertise as required, but the concern about risk and internal controls will always remain a central concern for an in-house internal audit function (IAF).

There is no evidence at this time that the existence or quality of internal audit has any direct influence on earnings management. However, it is reasonable to assume and, as necessary, to examine its indirect and/or moderating influence as it works through the other cornerstones of business, namely corporate governance, external audit and management itself. In relation to its future association with management, it would be a pity if internal audit was perceived as an agency fully external to the human processes of business. Once internal audit loses the confidence and trust of management and key personnel, its real value as a constructive and objective support mechanism will be lost.

Appendix A: Questionnaire on Internal Audit: Corporate Governance Issues impacting on Internal Audit's Existence in ASX-Listed Firms and its Influence on Earnings Management

Part A: Introduction

1. Please indicate whether your company has any internal audit function (either in-house or outsourced).

- Yes
 No

If your answer is **Yes**, please complete **Part B, C and D** to the best of your ability or refer the questionnaire to the person responsible for internal audit.

If your answer is **No**, please place the questionnaire in the reply paid envelope provided and post it back to the researchers as soon as possible. Thank you for your assistance in this regard.

Part B: Profile of the Respondent

1. What is your position in the organization?

Please state _____

2. Which professional qualifications have you acquired? (Please tick all applicable boxes)

- CIA
 CPA
 ICA
 Other. Please state _____

3. How many years of internal audit experience do you have?

Please state _____ years

4. How long have you been in the current internal audit position or role?

Please state _____ years

5. As the person responsible for internal audit, who do you report to functionally?
(Please tick all applicable boxes.)

- Chairman of audit committee
 Chairman of board of directors
 Chief executive officer
 Chief financial officer
 Other. Please state _____

6. As the person responsible for the internal audit function, do you have direct private access to the board of directors or the audit committee?

- Yes
 No

Part C: Internal Audit Structure

1. How long has your company conducted the internal audit functions (either in-house or outsourced)?

Please state _____ years

2. What was the number of full time equivalent company staff employed in internal audit during financial year ended 2011?

Please state _____

3. How many of the staff in Question **No. 2** above are professionally qualified (CIA, CPA, ICAA or equivalent)?

Please state _____

4. What is the average internal auditing experience of the internal audit staff **excluding** the head of the internal audit function, if applicable?

Please state _____ years

5. Using the following scale, indicate the extent to which the entire team of internal auditors received adequate training during the financial year ended 2011. (Please circle one appropriate number)

No Training →	0	1	2	3	4	5	6 ← Adequate Training	Not Sure
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6. What was the approximate annual expenditure for the **internal audit functions** in your company during financial year ended 2011 (in-house and/or outsourced)?

Please state AU\$ _____ (*million, e.g., 0.20 for \$200,000*)

7. If applicable, what was the approximate annual expenditure for **internal audit outsourcing** in your company during financial year ended 2011?

Please state AU\$ _____ (*million, e.g., 0.10 for \$100,000 or 50% of total IA expenditure outsourced*)

Part D: Internal Audit Outsourcing

1. Did your company outsource or co-source any of the internal audit activities during financial year ended 2011?

- Yes (Please answer Questions **2-8 and 12** below)
 No (Please answer Questions **9-12** below)

2. What was the approximate percentage of total internal audit expenditure allocated towards **internal audit outsourcing** during financial year ended 2011?

Please state _____% (*e.g., refer to example of 50% in Part C: Q. 7 above*)

3. According to the research literature on internal audit, the following activities are considered as routine in nature:

- Financial audit
- Compliance audit
- Operational audit

Given this information, what was the approximate percentage of total internal audit outsourcing expenditure referring to your answer in **Part D: Q. 2** above) allocated towards **non-routine outsourcing only** during financial year ended 2011?

Please state _____% (*e.g., 60% total outsourcing expenditure is non-routine or alternatively, 100% if only non-routine work is outsourced*)

4. To whom did you outsource the internal audit activities during financial year ended 2011?
(Please tick all applicable boxes.)

- Current external auditor
 Other accounting firm (Big 4)
 Other accounting firm (Non-Big 4)
 Internal audit specialist
 Other. Please state _____

5. What type of internal audit activities did your company perform during **financial year ended 2011** that you would classify as routine or non-routine and whether outsourced or not? (Please tick all applicable boxes.)

Internal audit activities	Routine or recurring	Non- routine or non- recurring	Outsourced or not		Percentage of total time spent on each activity
			Yes	No	
Financial audit					
Operational audit (e.g., integrated audit)					
Compliance audit					
Information systems review (e.g., information technology audit)					
Performance review (e.g., due diligence audit)					
Risk management review (e.g., risk and control self-assessment)					
Fraud investigation					
Special audit (e.g., special review at management request, assisting in re-engineering project, project team assistance, corporate governance implementation assistance, training assistance, assisting with integration after acquisition)					
Other. Please state					

(100%)

6. To your best knowledge, indicate for which of the following reasons your company decided to outsource (either partly or fully) internal audit activities. (Please tick all applicable boxes.)

Reasons for outsourcing	Answers		
	Yes	No	Do not know
External providers being industry specialist (includes technical expertise, experience, better quality, awareness of current standards and market trends)			
External providers being independent (includes objectivity, legally liable, accountable)			
External providers being more cost effective			
External providers being flexible (includes time management, control environment of the external providers)			
Company strategy (where company policy advocates the outsourcing of non-core activities)			
Other reason (Please state)			

7. To your best knowledge, please indicate the extent to which your company was satisfied with the quality of services provided by the outsourcing agency or agencies during the financial year ended 2011. (Please circle one appropriate number.)

Totally Unsatisfied →	0	1	2	3	4	5	6	← Totally Satisfied	Not Sure
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Provide any additional comments in relation to your choice in Question 7.

8. What is your company's plan regarding outsourcing internal audit functions over the next three (3) financial years?

Reasons

- Increase the extent of outsourcing _____
- Maintain the extent of outsourcing _____
- Decrease the extent of outsourcing _____
- Other, please state _____

After completing Question 8, please go direct to Question 12

9. Please state the reasons your company **did not** outsource the internal audit functions during financial year ended 2011?

10. Please indicate whether your company has any plans to start outsourcing the internal audit function in the future?

- Yes
- Perhaps
- No

11. If your answer for the above Question 10 is **Yes**, please state the reasons for the change in company policy.

12. Please provide comments in relation to any of the above questions or any other issues considered relevant to the present study.

End of Questionnaire

Thank you for taking part in this survey and completing this questionnaire.

Appendix B: List of all Hypotheses

Panel A: Association of audit committee effectiveness with the existence of internal audit function		
Hypothesis	Description	Accept/Reject
H _{1a1}	ASX-listed firms with independent audit committee members are more likely to be associated with the existence of an internal audit function.	Accept
H _{1a2}	ASX-listed firms with expertise among audit committee members are more likely to be associated with the existence of an internal audit function.	Reject
H _{1a3}	ASX-listed firms with frequent audit committee meetings are more likely to be associated with the existence of an internal audit function.	Accept
Panel B: Association of board of directors' effectiveness with the existence of internal audit function		
Hypothesis	Description	Accept/Reject
H _{1b1}	ASX-listed firms with independent directors on the board are more likely to be associated with the existence of an internal audit function.	Reject
H _{1b2}	ASX-listed firms with adequate numbers of directors on the board are more likely to be associated with the existence of an internal audit function.	Accept
H _{1b3}	ASX-listed firms with an independent board chair who is different to the person in the role of CEO are more likely to be associated with the existence of an internal audit function.	Accept
Panel C: Association of audit committee effectiveness with the existence of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H _{2a1}	ASX-listed firms with independent audit committee members are more likely to be associated with the existence of internal audit outsourcing.	Accept
H _{2a2}	ASX-listed firms with expertise among audit committee members are more likely to be associated with the existence of internal audit outsourcing.	Reject

H_{2a3}	ASX-listed firms with frequent audit committee meetings are more likely to be associated with the existence of internal audit outsourcing.	Reject
Panel D: Association of board of directors' effectiveness with the existence of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H_{2b1}	ASX-listed firms with independent directors on the board are more likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2b2}	ASX-listed firms with adequate numbers of directors on the board are more likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2b3}	ASX-listed firms with an independent board chair who is different to the person in the role of CEO are more likely to be associated with the existence of internal audit outsourcing.	Reject
Panel E: Association of internal audit quality with the existence of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H_{2c1}	ASX-listed firms with professionally certified internal auditors are less likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2c2}	ASX-listed firms with experienced internal auditors are less likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2c3}	ASX-listed firms with a large internal audit team are less likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2c4}	ASX-listed firms with adequate internal audit training are less likely to be associated with the existence of internal audit outsourcing.	Reject
H_{2c5}	ASX-listed firms that maintain internal auditors' objectivity are less likely to be associated with the existence of internal audit outsourcing.	Reject

H_{2c6}	ASX-listed firms that spend internal audit time performing financial audits are less likely to be associated with the existence of internal audit outsourcing.	Reject
Panel F: Association of audit committee effectiveness with the extent of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H_{3a1}	ASX-listed firms with independent audit committee members are positively associated with the extent of internal audit outsourcing.	Accept
H_{3a2}	ASX-listed firms with expertise among audit committee members are positively associated with the extent of internal audit outsourcing.	Reject
H_{3a3}	ASX-listed firms with frequent audit committee meetings are positively associated with the extent of internal audit outsourcing.	Reject
Panel G: Association of board of directors' effectiveness with the extent of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H_{3b1}	ASX-listed firms with independent directors on the board are positively associated with the extent of internal audit outsourcing.	Reject
H_{3b2}	ASX-listed firms with adequate numbers of directors on the board are positively associated with the extent of internal audit outsourcing.	Reject
H_{3b3}	ASX-listed firms with an independent board chair who is different to the person in the role of CEO are positively associated with the extent of internal audit outsourcing.	Reject
Panel H: Association of internal audit quality with the extent of internal audit outsourcing		
Hypothesis	Description	Accept/Reject
H_{3c1}	ASX-listed firms with professionally certified internal auditors are negatively associated with the extent of internal audit outsourcing.	Reject
H_{3c2}	ASX-listed firms with experienced internal auditors are negatively associated with the extent of internal audit outsourcing.	Reject

H _{3c3}	ASX-listed firms with a large internal audit team are negatively associated with the extent of internal audit outsourcing.	Reject
H _{3c4}	ASX-listed firms with adequate internal audit training are negatively associated with the extent of internal audit outsourcing.	Reject
H _{3c5}	ASX-listed firms that maintain internal auditors' objectivity are negatively associated with the extent of internal audit outsourcing.	Reject
H _{3c6}	ASX-listed firms that spend internal audit time performing financial audits are negatively associated with the extent of internal audit outsourcing.	Reject
Panel I: Association of internal audit function with discretionary accruals/earnings management		
Hypothesis	Description	Accept/Reject
H ₄	ASX-listed firms with an internal audit function are negatively associated with earnings management.	Reject
Panel J: Association of internal audit outsourcing with discretionary accruals/earnings management		
Hypothesis	Description	Accept/Reject
H ₅	ASX-listed firms with internal audit outsourcing are negatively associated with earnings management.	Reject
Panel K: Association of the extent of internal audit outsourcing with discretionary accruals/earnings management		
Hypothesis	Description	Accept/Reject
H ₆	ASX-listed firms with any extent of internal audit outsourcing are negatively associated with earnings management	Reject
Panel L: Association of internal audit quality with discretionary accruals/earnings management.		
Hypothesis	Description	Accept/Reject
H _{7a}	ASX-listed firms with professionally certified internal auditors are negatively associated with earnings management.	Reject

H _{7b}	ASX-listed firms with experienced internal auditors are negatively associated with earnings management.	Reject
H _{7c}	ASX-listed firms with a large internal audit team are negatively associated with earnings management.	Reject
H _{7d}	ASX-listed firms with adequate internal audit training are negatively associated with earnings management.	Reject
H _{7e}	ASX-listed firms that maintain internal auditors' objectivity are negatively associated with earnings management.	Reject
H _{7f}	ASX-listed firms that spend internal audit time performing financial audits are negatively associated with earnings management.	Reject

Appendix C: Distribution of Discretionary Accruals (DAC) in Relation to Nine Main Industries

The following figure, Figure C1, provides insights into the distribution of discretionary accruals (DAC) in relation to industry. Nine main industry categories are shown on the x-axis against the mean values of DAC on the y-axis.

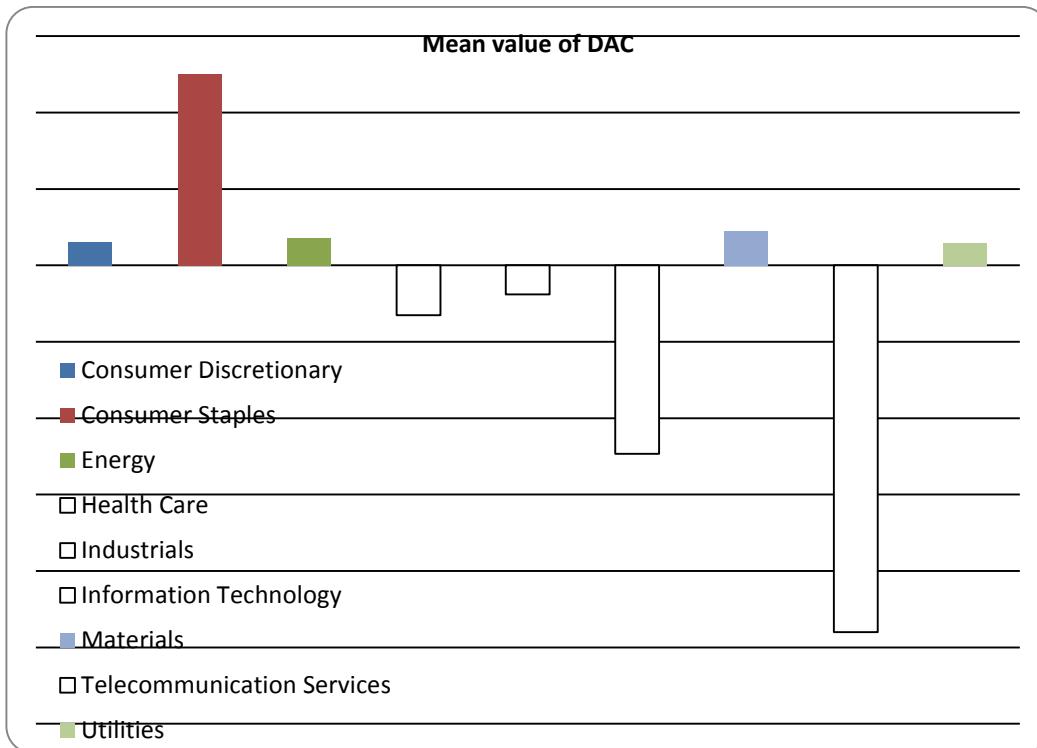


Figure C1: Distribution of Mean Value of DAC within Industries

The derivation of DAC as a measure is explained in subsection 4.4.4 and (using the modified Jones model) represents a regression residual based on changes in the values of non-cash assets, adjusted for changes in operating current liabilities less depreciation and amortisation (as applicable) (Dechow et al. 1995). Discretionary accruals (DAC) values for each ASX firm were ascertained using data from the FinAnalysis database.

Standardised values are recorded and plotted as a mean value within industry sectors as illustrated in Figure C1. Positive values for DAC residual scores indicate evidence of comparatively greater use of discretionary accruals (DAC) for firms making up each sector, with negative scores indicating comparatively less use of accruals. Mean values can be distorted by the number of firms recorded in each sector. For example, firms in Consumer Staples and Telecommunication Services are small in number compared to the larger representation of firms in Industrials and Materials.

Firms in Industrials tend to make greater use of internal audit functions (IAFs) compared to firms in Materials; however, the differences are not significant and have a tendency to merge towards zero (0) as the level of representation increases.

Distribution of DAC in relation to firms with or without IAF

The following figure, Figure C2, provides insights into the distribution of DAC in relation to whether firms have or do not have an internal audit function (IAF). The mean values of DAC on the x-axis are shown against the firms with or without an IAF on the y-axis.

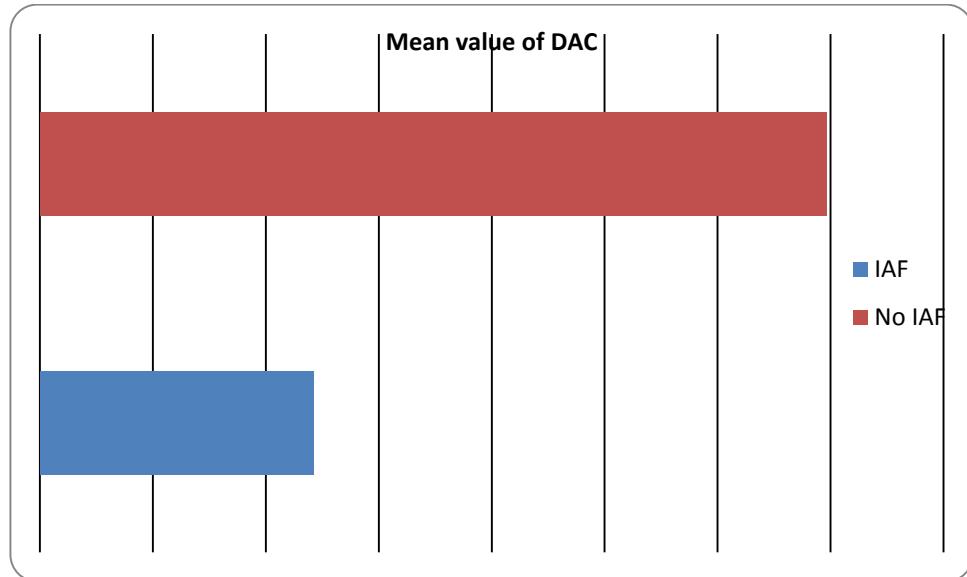


Figure C2: Distribution of Mean Value of DAC with or without IAF

As reported above, the differences in terms of the DAC residual values are not significant for this sample from the top 500 ASX-listed firms (n=240) included in the study's analysis.

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