AUDITOR INDEPENDENCE AND AUDIT QUALITY:

The Role of Director–Auditor Interlocking

A thesis submitted for the degree of Doctor of Philosophy of The Australian National University.

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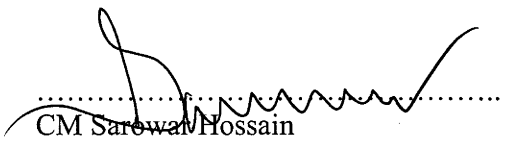
Declaration

This thesis comprises only my original work and has not previously been submitted for a degree or a diploma in any university. To the best of my knowledge, the thesis contains no material previously published or written by another person and due acknowledgement has been made in the text to all other materials used. This thesis is less than 100,000 words in length, exclusive of tables, bibliography, appendices, and footnotes.



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Abstract

This study examines the associations between interlockings and auditor independence and audit quality. The type of interlocking relationships examined in this study are director interlocking, director–audit firm/partner interlocking, audit committee member interlocking, and audit committee member–audit firm/partner interlocking. The issues associated with these interlockings are important with regard to auditor independence and audit quality because links created between directors and/or audit committee members and a common audit firm/partner through other companies could raise questions about auditor independence as they could affect both actual and perceived audit quality. Auditor provided non–audit services fees, and audit firm engagement tenure with the current auditee are the two proxies for auditor independence (a component of audit quality) used in this study and audit quality is proxied by the likelihood of issuing a qualified audit opinion, and the level of earnings management/discretionary accruals tolerated by the auditor.

The results indicate that director interlocking is significantly and positively associated with auditor provided non–audit services fees, which provides evidence of potentially impaired auditor independence. Director–audit partner interlocking, audit committee member-audit firm interlocking and audit committee member–audit partner interlocking are significantly and negatively associated with auditor provided non–audit services fees and thus no evidence is found that these relationships impair auditor independence. The former two of these findings are sensitive to whether these fees are deflated by total fees to the auditor.

Director–audit firm interlocking is significantly and positively associated with audit firm tenure, which may provide evidence of impaired auditor independence. In

contrast, audit committee member interlocking is significantly and negatively associated with audit firm tenure, which supports the proposition that interlocked audit committee members may recommend changing auditors more frequently, possibly as a means to improve auditor independence.

The results indicate that director interlocking, director–audit firm interlocking and director–audit partner interlocking are significantly and negatively associated with the likelihood of receiving a qualified opinion. Audit committee member–audit partner interlocking is also significantly and negatively associated with the likelihood of receiving a qualified audit opinion. These results provide evidence that a higher number of links between directors, directors–audit firms/partners, and audit committee members–audit partners reduces the likelihood of a company receiving a qualified opinion from its auditor. These results can be interpreted as evidence of reduced audit quality as a result of these interlockings.

The results from this study also document that director interlocking, director–audit firm interlocking and director–audit partner interlocking are weakly significantly and positively associated with the absolute value of discretionary accruals. Audit committee member–audit partner interlocking is strongly significantly and positively associated with the absolute value of discretionary accruals. However, apart from director interlocking, these results are sensitive to the inclusion of more extreme values for discretionary accruals. The results are much stronger for smaller companies and when examining income-decreasing discretionary accruals. These results provide evidence of reduced audit quality when there are more links between directors, and more tentative evidence for links between directors–audit firms/partners, and audit committee members–audit partners.

Therefore, most of the results provide evidence consistent with impaired auditor independence and reduced audit quality associated with the number of links between directors and/or audit committee members and audit firms/partners in other companies. A personal relationship may be created when directors and/or audit committee members work together with a common audit firm/partner in more than one company, which may be an important issue with regard to both real and perceived auditor independence and audit quality.

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List of Abbreviations

AICD	Australian Institute of Company Directors
AICPA	American Institute of Certified Public Accountants
APES	Accounting Professional and Ethical Standards
ASA	Australian Shareholders' Association
ASX	Australian Securities Exchange
CLERP	Corporate Law Economic Reform Program
CPA	Certified Public Accountants
ICAA	Institute of Chartered Accountants in Australia
ICAEW	Institute of Charted Accountants in England and Wales
ICC	International Chamber of Commerce
NACD	National Association of Corporate Directors
POB	Public Oversight Board
SEC	Securities and Exchange Commission
SOX	The Sarbanes Oxley Act 2002
UK	United Kingdom
USA	United States of America

CHAPTER ONE
INTRODUCTION

1.0 INTRODUCTION

This study examines the associations between interlockings[1] and auditor independence and audit quality. Interlockings are defined in this thesis as the relationships created between directors, between directors and audit firms/partners, between audit committee members, and between audit committee members and audit firms/partners through working in other companies.[2] The potential issues associated with interlockings[3] in the context of auditing are important in regard to auditor independence and audit quality because links between the same director and a common auditor may impair auditor independence (Davison *et al.,* 1984; Jubb and Houghton, 1999; Jubb, 2000), which could affect actual and/or perceived audit quality.

A high quality independent audit is essential in providing reliable financial information to users for their decision–making. The value of an audit report arises from

[1] The terms "interlocking" and "interlockings" are used differently in this study. The term "interlocking" is used to indicate the specific type of link. However, the term "*interlockings*" is used collectively to refer to: director interlocks (DLKS), director–audit firm interlocks (DAFLKS), director–audit partner interlocks (DAPLKS), audit committee member interlocks (ACLKS), audit committee member–audit firm interlocks (ACAFLKS), and audit committee member–audit partner interlocks (ACAPLKS) throughout this study.

[2] In Australia, there is no restriction on the number of board memberships a person may hold. The Australian Institute of Company Directors (AICD) (2005) argues that the number of directorships that a person accepts should be limited only by that person's capacity to properly carry out the obligations required of each directorship on behalf of the shareholders. Australian directors may, and do in many instances, sit on more than one board of both listed and unlisted entities, thus creating interlocking relationships (Jubb, 2000). A number of studies establish the existence of director interlocking between large listed companies in Australia (e.g., Rolfe, 1967; Hall, 1983; Stening and Wan, 1984; Carroll *et al.,* 1990; Alexander and Murray, 1992). Using data from 2003, Kiel and Nicholson (2006) finds a large number of director interlockings in their study for ASX listed companies.

[3] In the literature, interlocking directorates refer to any situation in which two or more corporations share one or more directors in common, and such multiple or shared directorships are commonly referred to in the relevant literature as interlocking directorates (Allen, 1974; Stening and Wan, 1984; Zajac, 1988; Mizruchi, 1996; Jubb and Houghton, 1999; Jubb, 2000). This occurrence is also known as multiple directorates and cross-directorships. When an interlocking director comes into contact with a common auditor across other companies on whose boards they sit, a director–auditor interlock occurs (Jubb and Houghton, 1999, Jubb, 2000; Courtney and Jubb, 2005). A director–audit partner interlock occurs when director–audit firm interlocking companies have a common audit partner from the same audit firm. A similar relationship can be created among audit committee members who sit on more than one audit committee, creating interlocks with audit firms and audit partners.

the fact that it is issued by someone who is, in fact, independent (Wilkinson, 1969; Wolnizer, 1978). Professional bodies and regulatory authorities express auditor independence in terms of the auditor's attitude of mind, freedom from financial indebtedness to clients, and freedom from personal obligations to clients arising as a result of business relationships with directors, managers and other officers in the organisation (Wolnizer, 1978; Chan, 2004; APES 110 Code of Ethics for Professional Accountants, 2006). Auditors should not only be independent in fact but should also be independent in appearance (Chan, 2004). To ensure actual or perceived audit quality, auditors are required to be and to be seen to be, free of any interest that is incompatible with objectivity (Chan, 2004).

An auditor's joint provision of audit and non–audit services to audit clients is a potential threat to auditor independence, both in fact and in appearance (Chan, 2004; Hay *et al.,* 2006). A long association between management and the auditor is also a major threat to the actual or perceived independence of auditors (Hoyle, 1978; Courtney and Jubb, 2005). When director interlocked companies are audited by the same audit firm, the tenure of that auditor is significantly longer than that of firms are not so linked (Courtney and Jubb, 2005). Ye *et al.* (2006) finds that lengthy audit firm tenure was a contributing factor that prompted auditees to purchase non–audit services from their current auditors. Therefore, interlocking associations may amplify joint provision of audit and non–audit services by the auditor, and may also foster longer auditor tenure due to the close relationships formed in linked companies as compared to non–linked situations. This may be seen as a threat to auditor independence, be it in fact or in appearance, and audit quality. To examine these issues in interlocking situations, this

thesis uses four proxies for measuring audit quality. Two of the proxies relate to auditor independence and two of the proxies relate to actual audit quality.[4]

The first proxy for measuring auditor independence (a component of audit quality) is auditor provided non–audit services (APNAS) fees, which is the most commonly used proxy in the literature (e.g., DeFond *et al.,* 2002; Frankel *et al.,* 2002; Kinney and Libby, 2002; Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Hoitash *et al.,* 2005; Ruddock and Taylor, 2005; Ye *et al.,* 2006; Gul *et al.,* 2007; Cahan *et al.,* 2008; Huang *et al.,* 2008). The second proxy for measuring auditor independence (a component of audit quality) is audit firm tenure with the current auditee, which is also a commonly used proxy (e.g., DeFond and Subramanyam, 1998; Geiger and Raghunandan, 2002; Johnson *et al.,* 2002; Myers *et al.,* 2003; Carcello and Nagy, 2004; Mansi *et al.,* 2004; Courtney and Jubb, 2005; Ghosh and Moon, 2005; Hamilton *et al.,* 2005; Carey and Simnett, 2006; Ye *et al.,* 2006; Gul *et al.,* 2007; Cahan *et al.,* 2008; Jackson *et al.,* 2008).

The first proxy for measuring actual audit quality is the likelihood of issuing a qualified audit opinion by the auditor. An auditor may be reluctant to qualify[5] an audit report for one of a group of linked companies because the audit qualification may adversely affect the interests of corporate participants (Ball *et al.,* 1979). An auditor may also be reluctant to qualify the audit reports of linked companies because, in an

[4] According to DeAngelo's (1981a) definition, audit quality is a function of the auditor's ability to detect material misstatements (auditor competence) and willingness to report discovered material misstatements (auditor independence). Jackson *et al.* (2008) uses two measures of actual audit quality such as (1) the propensity to issue going-concern report and, (2) the level of discretionary accruals.

[5] This study classifies audit reports as either unqualified or qualified. Since the period to which the data used in this thesis applies, the word "qualified" has been replaced in Auditing Standard ASA 701(April 2006). ASA 701 uses the term "modification" instead of "qualification". Modification to the auditor's report refers to the following situations: an emphasis of a matter; a qualified opinion (referred to in AUS 702 as an "except for opinion"); a disclaimer of opinion (referred to in AUS 702 as an "inability to form an opinion"); or an adverse opinion (ASA 701, paragraph 4, 2006). However, as the current study is based on data relating to 2003–2005 which predates the implementation of the above recommendations, it continues to use the term 'qualified' to refer to types of opinion other than unqualified as per AUS 702.

interlocking situation, auditors may become compliant for fear of losing not just one audit over which an issue has arisen, but other audits that have the same director(s) (Davison *et al.,* 1984; Jubb, 2000). Several studies use the likelihood of receiving a qualified audit opinion as a proxy for measuring audit quality (e.g., DeFond *et al.,* 2002; Choi and Doogar, 2005; Ahmad *et al.,* 2006; Hay *et al.,* 2006; Jackson *et al.,* 2008; Lai and Gul, 2008).

The second proxy for measuring actual audit quality is the level of earnings management/discretionary accruals tolerated by the auditor. The issue of associations between interlockings and earnings management is important because accruals are argued to have information content in terms of their ability to alert auditors to potential earnings manipulation (Francis and Krishnan, 1999; Jubb, 2000). The close association, familiarity and large stake of audit firm/partner and directors in linked companies may be used by management as an opportunity to manage earnings. Numerous studies use earnings management (discretionary accruals) as a proxy for financial reporting or earnings quality and hence audit quality (e.g., DeFond *et al.,* 2002; Frankel *et al.,* 2002; Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Hoitash *et al.* 2005; Ruddock and Taylor, 2005; Gul *et al.,* 2007; Huang *et al.,* 2007; Cahan *et al.,* 2008; Jackson *et al.,* 2008; Lai and Gul, 2008).

To examine the above issues in interlocking situations, this thesis uses Australian Securities Exchange (ASX) listed companies during the period 2003–2005.

1.1 MOTIVATION AND RESEARCH QUESTIONS

The main motivation for this study comes from the increasing concerns of regulators in Australia and overseas regarding corporate governance, client/director–

audit firm/partner relationships and the debate surrounding auditor independence and audit quality after corporate collapses early this century (Ramsay Report, 2001; CLERP 9 Act, 2004). These high profile collapses motivated to introduce the Corporate Law Economic Reform Program (CLERP 9) Act (2004) in Australia. This Act does not ban APNAS, however, it requires disclosing the categories of APNAS fees in the company's annual report. It also requires mandatory rotation of the lead audit partner (but not audit firm) every five years for ASX listed companies. In the United States of America (USA), restrictions on APNAS and audit partner tenure are among the principal provisions in the Sarbanes–Oxley Act (SOX) (2002), designed to enhance auditor independence (Chen *et al.,* 2005). In Australia, there was a controversial relationship between the management of failed insurance company HIH and its auditor, Arthur Andersen (Royal Commission Report, 2003). HIH paid more in APNAS fees than audit fees, which raised questions in relation to auditor independence and audit quality.[6]

The other motivations for this study come from the scant research on the impact of interlockings on auditor independence and actual audit quality. Interlocks create personal contacts and the building of personal contacts and networks by the audit firm/partner with common directors of linked companies should be valued and nurtured in "relational exchanges" (Jubb and Houghton, 1999, p.2). These interpersonal relationships might become close among the parties due to their frequent interactions and contacts, and these will occur more frequently for linked companies compared to non–linked companies. Due to these interpersonal associations and auditors' knowledge about the linked companies through their provision of auditing services, directors might

[6] In the USA, one of the most important issues in the Enron case was the large amount of APNAS fees paid to Arthur Andersen relative to those for audit services. While providing audit services, Arthur Andersen also provided management consulting, information technology and operational consulting services, which were argued to have compromised their independence (Holtzman, 2004).

be more interested in engaging the incumbent auditor for non–audit services than might be the case otherwise. However, the joint provision of audit and non–audit services and its potential impact on auditor independence and audit quality is one of the most critical issues facing the auditing profession. In the context of APNAS and auditor independence, DeFond and Francis (2005) argues that the Sarbanes-Oxley Act (SOX, 2002) provision that bans APNAS is at best misguided, and at worst politically-motivated. Their study also argues that

> ".....we also believe, however, that there are many important questions not yet addressed by researchers in this area, including the following: Do personal relationships created by nonaudit services threaten independence? Are contextual issues such as the firm's overall governance environment important in explaining whether auditor independence is impaired?" (p. 6).

The arguments directed against APNAS fees are normally expressed in terms of economic dependency and mutuality of interest (Wines, 1994). If APNAS fees become sufficiently important to the auditor in relation to an individual client or a group of clients, the auditor's economic dependence on those clients may cause bias and a loss of impartiality and objectivity (Wines, 1994). While the fees for APNAS from individual companies may not be significant, total revenue from APNAS fees for an audit firm is likely to be higher from a family of linked companies than would be the case in the absence of such a link, which may create strong economic bonds between the auditor and the linked companies. Courtney and Jubb (2005) suggests that examining whether the level of non–audit services purchased from the incumbent auditor is contingent on the number of director–auditor links might add insight to the independence debate as it relates to the joint provision of audit and non–audit services.

The impact of personal connections in exchange relationships has been well–established in the provision of auditing services (Pfeffer, 1994; Courtney and Jubb, 2005). Seabright *et al.* (1992) argues that the auditor–client relationship relies largely on personal knowledge and trust and that these characteristics act as disincentives for clients to change auditors. The:

> "examination of the determinants of tenure length may be as important, if not more important, than the determinants of auditor change to accounting firms and to concerns over corporate governance" (Courtney and Jubb, 2005, p. 5).

Both the USA's SOX (2002) and Australia's CLERP 9 Act (2004) address partner rotation rather than firm rotation. The issue of firm rotation has, however, received much public comment after the collapse of Enron and WorldCom in the USA and HIH in Australia (Courtney and Jubb, 2005). There are concerns about the impact of familiarity with the client, whether positive or negative, on audit quality and auditor independence when auditor tenure is for particularly short or long periods (Raghunathan *et al.,* 1994; Geiger and Raghunandan, 2002; Courtney and Jubb, 2005). DeFond and Francis (2005) argues that there is a realistic concern that mandatory audit firm rotation may yet be proposed by the Securities and Exchange Commission (SEC). They state ".....we encourage more research in this area. Since there is little research on the effects of the 'revolving door' we encourage more research in this area as well" (p. 6). Thus, research outcomes that suggest an association between interlockings and longer auditor tenure may accentuate concerns over auditor independence and audit quality (Courtney and Jubb, 2005).

Auditing is a relationship–driven service with networks of personal relationships developed between managers, directors, shareholders and the audit firm/partner (Jubb

and Houghton, 1999). The interpersonal relationships between directors and/or common audit committee members and auditors of linked companies might create a conscious or unconscious tendency for the auditor to favour the relationship over professional objectives, which might affect the auditor's ability to exercise an appropriate level of professional scepticism (Johnstone *et al.,* 2001). If auditors are considered as economic agents who make self–interested decisions, the auditor's future economic interest in a client may affect the auditor's reporting behaviour (Ruiz–Barbadillo *et al.*, 2006). An auditor may be reluctant to issue a qualification due to concerns that by qualifying the audit report the auditor may lose the client (Kida, 1980; Barnes and Huan, 1993). Several studies suggest that future research could investigate whether the audit of companies when common director–auditor links exist is of a different quality to the audit of companies when these links do not exist, and also that director–auditor link investigations can be extended to the audit partner level (e.g., Jubb and Houghton, 1999; Jubb, 2000; Courtney and Jubb, 2005). In addition, Jubb (2000) reports that director–audit firm links are associated with higher levels of absolute value of discretionary accruals. Jubb (2000) suggests that since the finding with respect to the absolute value of discretionary accruals was probably the most serious risk to auditor independence in the presence of director–auditor links, further investigation needed to be conducted.

The final motivation for this study comes from the increasing role of audit committee members in overseeing their entity's financial reporting quality. Recently, significant emphasis has been placed on the importance of the audit committee's role in the corporate governance of public companies, especially following the collapses of apparently healthy corporations that had received clean audit reports (Levitt, 1998). Audit committees should take an active role in overseeing the external audit and one of the important parts of this oversight relates to the independence of the external auditor

(Levitt, 1998). Lam (1975) argues that the most important rationale for the audit committee is to enhance the independence of the external auditor and the reliability and credibility of corporate financial reporting. Seabright *et al.* (1992) suggests that the members of the audit committee may be linked with other boards (audit committees) and it would be useful to explore the impacts of these linkages on audit quality and auditor independence. Cohen *et al.* (2002) argues that audit committees are now required to be actively engaged in the auditor retention process, thus, research relating to corporate governance factors that influence auditor retention and auditor switching decisions are likely to be fruitful areas for future research.

In addition, Jubb (2000) suggests that some interlocking participants may be more influential than others, in particular the audit committee members. Thus, it is important to investigate the impact of interpersonal associations between audit committee members and the audit firm/partner created through working together in the context of more than one company's audit committee on auditor independence and audit quality. To date, auditor independence and audit quality investigated in the literature:

> "tend to be theorised or measured at an impersonal or institutional level, rather than reflecting acknowledgement of the personal relationships involved in business decisions of this type" (Jubb and Houghton, 1999, p. 3).

There are few studies that have acknowledged the importance of the 'people' factor in the literature (Jubb and Houghton, 1999). Davison *et al.* (1984) documents that there is a significant relationship between the number of director interlocks of a company and the probability that these interlocked companies are audited by the same public accounting firm as the focal company. Seabright *et al.* (1992) examines auditor–client attachments (i.e. tenure) through relationships and finds that attachment of

individuals (exchange partners and clients) primarily responsible for exchange relationships decreased the likelihood of switching auditors. Jubb and Houghton (1999) and Jubb (2000) examine director–audit firm relationships and auditor choice and find that there is a significantly greater probability of choosing the same auditor for a director's interlocking companies. Jubb (2000) also investigates the association between director–audit firm links and audit quality and finds that director–auditor linked companies receive fewer qualified opinions and linked companies also report a higher absolute value of discretionary accruals. Courtney and Jubb (2005) examines director–audit firm links and their effect on auditor engagement tenure and finds longer auditor tenure for director–auditor linked companies compared to non–linked companies.

Prior research has, therefore, examined the effects of director–audit firm interlocking on auditor choice, auditor tenure, audit opinion and discretionary accruals. However, other types of relationships may also affect auditor independence and audit quality, such as director interlocking, director–audit partner interlocking, audit committee member interlocking, and audit committee member–audit firm/partner interlocking. These relationships are important issues to investigate, not least because the Ramsay Report (2001) states that:

> "in determining whether an auditor is independent, all relevant circumstances should be considered, including *all relationships* between the auditor and the audit client" (p. 6).

There is evidence and the evidence is concerning, so further studies examining the associations between interlockings and auditor independence and audit quality are clearly warranted due to the lack of research of an association between interlockings

and APNAS fees, audit firm tenure, audit opinion and discretionary accruals. To that end, this study addresses the following research questions:

RQ1: ***Are interlockings associated with auditor provided non–audit services fees?***

RQ2: ***Are interlockings associated with audit firm engagement tenure?***

RQ3: ***Are interlockings associated with the likelihood of issuing a qualified audit opinion by the auditor?***

RQ4: ***Are interlockings associated with earnings management?***

1.2 CONTRIBUTIONS

The contributions of this study are two–fold. First, the research has a number of implications for regulatory bodies and the accounting and auditing professions. Second, the results of this study enrich the existing empirical literature on auditor independence and audit quality. This study has the capacity to inform policymakers, corporate boards, and academic researchers on the need to consider the importance of promoting appropriate guidelines on the composition of boards of directors and audit committees. Specifically, the results of this study have the capacity to enlighten the related bodies on the importance of interpersonal associations between boards of directors and/or audit committee members and audit firms/partners in other companies and their effect on auditor independence and audit quality.

Furthermore, this study has the capacity to contribute to the debate over APNAS fees and the economic dependence of an audit firm on a client or a group of clients. This is the first study to investigate the role of interlockings and their association with APNAS. The findings will be useful to regulators, professional accounting bodies, auditors and audit partners regarding the joint provision of audit and APNAS and

auditor independence where directors, audit committee members and audit firms/partners come together through linked companies.

The findings from this study may also have important implications for considerations of auditor tenure and auditor independence because there are concerns that the ability to retain clients for a longer time period provides incentives for auditors to settle disputes in the client's favour; disputes that may otherwise result in the loss of the client (Ruiz–Barbadillo *et al.*, 2006). Prior research focuses on investigating the relationships between audit quality and auditor tenure. However, there are other dimensions of auditing and corporate governance characteristics that may potentially affect audit firm tenure. Findings of association between audit firm tenure and interlockings may contribute to the debate on mandatory audit firm rotation and auditor independence issues when audit firms/partners are associated with longer tenure for firms with common directors and/or audit committee members.

Findings relating to audit quality might be useful to auditors, regulators and users of audited financial statements in an interlocking environment where directors and/or audit committee members and audit firms/partners links are associated with the likelihood of receiving a qualified opinion. Findings relating to earnings management will provide evidence on the association between the discretionary accruals and the number of interlocking links, which has not been researched as evidence of audit quality.[7] The findings from the audit opinion and earnings management produce more consistent evidence to support the view that certain types of interlockings are linked with biased financial reporting. These findings may support any future regulatory initiatives to prevent firms from appointing directors of companies with the same

[7] Jubb (2000) provides evidence of association between director-audit firm interlocking and discretionary accruals, however, her study does not examine other types of interlocking links used in the current study.

auditor. Alternatively, the results may support a future move to impose a "cooling-off" period before a director can serve as a director of another company with the same auditor. These results can also be of interest to regulators as they support the mandatory rotation of audit partners required by the Corporate Law Economic Reform Program (CLERP 9, 2004) and SOX (2002).

Finally, the findings from this study will contribute to the current literature through the evidence they present on auditor independence and audit quality issues when directors and audit committee members work together with the same auditor in other companies. The findings from this study offer at least two important contributions to the extant literature. First, this is the first study to provide evidence on how an interlock associated with having the same audit partner can lead to biased financial reporting. Second, while studies examining audit committee effectiveness have primarily focused on the effect of characteristics such as independence, expertise, and diligence, the current study is also the first to examine how the effectiveness of audit committees can be compromised by the presence of interlocked audit committee members. This is evidenced from significant associations between the likelihood of issuing a qualified audit opinion, discretionary accruals and audit committee member-audit partner interlocking.

1.3 ORGANISATION OF THIS STUDY

The remainder of this thesis is organised as follows. Chapter 2 provides the conceptual framework and the development of the hypotheses. Chapter 3 provides details of the methods used to examine the research questions (hypotheses) and defines the test and control variables for each of the models. Chapter 4 provides a description of the sample, outlining the data collection procedures and the manner in which the

frequency of interlocking is calculated, and presents descriptive statistics for the sample companies and for the interlocking variables. Chapter 5 provides the results of the analysis of the auditor independence models. The results of the analysis of the audit quality models are provided in Chapter 6. The thesis concludes in Chapter 7 with a discussion of the results, the limitations of this study, and suggestions for future research.

CHAPTER TWO
CONCEPTUAL FRAMEWORK AND DEVELOPMENT OF HYPOTHESES

2.0 INTRODUCTION

This chapter provides the conceptual framework for this study and explains how interlocking associations may affect auditor independence and audit quality. The conceptual framework depicts the expected associations between interlockings and auditor provided non–audit services (APNAS) fees, and interlockings and audit firm tenure (AFTENURE). These are both proxies for measuring auditor independence. This chapter also depicts the expected associations between interlockings and the likelihood of receiving a qualified audit opinion (OPINION), and interlockings and discretionary accruals (DACC), which are two proxies for measuring actual audit quality. Finally, this chapter develops the hypotheses tested in this study.

2.1 CONCEPTUAL FRAMEWORK

The value of the auditing profession is based both on auditors' actual and perceived competence and independence (Ye *et al.,* 2006). However, there are incentives that might induce auditors to compromise their independence (Ye *et al.,* 2006). Ye *et al.* (2006) argues that among these factors, the economic dependence of auditors on APNAS fees and also the personal relationships developed during lengthy auditor tenure have been alleged to contribute to the erosion of auditor independence. There are concerns for auditor independence in terms of the joint provision of APNAS because it can create knowledge spillovers that could lead to economic bonding (Simunic, 1984; Magee and Tseng, 1990; Becker *et al.,* 1998; Larcker and Richardson, 2004; Ye *et al.,* 2006). This economic bonding may impair both actual and perceived auditor independence and audit quality because the audit firm may be more unwilling to criticise the work done by its consultancy division and lose lucrative APNAS fees,

which may result in auditors being less likely to disagree with management's interpretation of accounting matters (Khurana and Raman, 2006; Ye *et al.,* 2006; Holland and Lane, 2008).

According to the theory of relationship marketing, a long–term association between the buyer and seller has the potential to bring benefit to both parties (Ye *et al.,* 2006). From the audit firm perspective, a close relationship, developed over time at both the firm level and at the interpersonal level, is an important marketing tool for the auditor to continue providing existing services with clients (Clark and Payne, 1994; Huntley, 2006). However, it is suspected that a personal relationship developed between auditor and client may create bonds of loyalty or emotive relationships, which will consciously or subconsciously impact auditor independence (Ye *et al.,* 2006). There are also regulatory concerns that such close relationships and potential economic dependence due to joint audits and APNAS may have a detrimental effect on auditor independence and audit quality (Chai and Jubb, 2000; Ye *et al.,* 2006).

The current study uses two measures of actual audit quality.[8] First, actual audit quality is measured in terms of the likelihood of issuing a qualified audit opinion when it is deserved, which is consistent with DeAngelo's (1981a) definition of quality of audit services as the likelihood of auditors' discovering and reporting material misstatements in audited financial statements (audit quality is a function of technical

[8] As auditor independence and audit quality is hard, if not impossible, to observe, prior studies use earnings management surrogates (Menon and Williams, 2004; Myers *et al.,* 2003), or audit opinion issuance (Defond *et al.,* 2002; Geiger and Raghunandan, 2002) as estimations of audit quality. Given that: "the financial statements are the joint production of both managers and auditors, the increased earnings management or reduced accounting conservatism may not be attributable to the auditor's failure to detect and report errors, especially when the accounting procedure does not violate accounting standards" (Ye *et al.,* 2006, p. 12).

competence or the ability to detect misstatements and auditor independence[9] is the auditor's willingness to report such misstatements). The present study examines all types of qualifications (audit opinions that are other than clean) because "auditor independence is not solely defined in terms of the issuance of a particular type of modification" (Lai and Gul, 2008, p. 220). Lai and Gul (2008) argues that although a going concern modification is important, it is however, only relevant for firms that have a relevant problem (e.g., financial distress). Lai and Gul (2008) also argues that:

> "for financially healthy firms, independence of auditors' reporting is still an important issue and could be investigated by other types of modifications" (p. 220).

Prior studies also use auditors' reporting opinions as a measure of auditor independence (e.g., Craswell, 1999; Firth, 2002; Jackson *et al.,* 2008). The current study adopts the same measure and posits that if the auditors of interlocking companies offer the same level of audit quality as non–interlocking companies, then there should be no difference in the likelihood of issuing qualified opinions between interlocking and non–interlocking companies.

Second, actual audit quality is also measured in terms of clients' level of discretionary accruals, which represents the part of total accruals that is more susceptible to manipulation by managers and which is frequently used in the literature as a proxy for earnings management (e.g., Jones, 1991; DeFond and Jiambalvo, 1994; Jackson *et al.,* 2008; Lai and Gul, 2008). The current study posits that if the levels of discretionary accruals of interlocking companies are not different than those of non–interlocking companies, then the audit quality of interlocking companies is not likely to

[9] This study defines auditor independence as: "an objectivity, both real and perceived, sufficient to overcome conflicting self-interest incentives that might otherwise cause auditors to ignore, conceal or misrepresent their findings" (Ikin, 2003, p. 4).

be different than the audit quality of non–interlocking companies. This study uses the absolute value of discretionary accruals estimated by using forward–looking modified Jones (1991) model suggested by Dechow *et al.* (2003). An important argument for using the absolute value of discretionary accruals is that auditors are concerned with discretionary accruals rather than their direction (Francis and Krishnan, 1999).

The current study argues that the relationships established between directors, audit committee members and audit firms/partners in linked companies may affect auditor independence and audit quality. This thesis uses agency theory as the conceptual underpinning of the relationships among directors, audit committee members, and auditors in the organisations and to investigate the effect of these relationships on auditor independence and audit quality. Under this theory, there are two types of parties primarily in the organisation: principal(s) (shareholders), and agent(s) (managers, directors, auditors etc.). Due to the separation of ownership and management in large organisations, the board of directors is appointed to monitor and verify the actions of management and protect the principals' interests. Audit committees are established, under this theory, to provide assurance to the governing board that the organisation accurately reports financial information to internal and external users. The demand for auditing arises from the auditor's independent monitoring role in the principal-agent relationship (Eilifsen and Messier, 2000). However, these monitoring mechanisms[10] may be influenced by interpersonal associations among the parties (directors, audit committee members, auditors/partners) by engaging together for more frequent and hence longer periods in the linked companies compared to non-linked companies. Since

[10] Marnet (2004) suggests that "one of the key messages of the more recent corporate debacles is that excessive reliance has been placed on the roles of monitors in the traditional approach to corporate governance. The independence and impartiality of the monitors and gatekeepers cannot be assumed to be sufficiently strong to prevent significant managerial self-dealing and fraud. Findings from cognitive research, group decision making, and recent work on managerial power and auditor independence suggest that some of the traditional means to minimising the agency problems are flawed in their description of how individuals behave in real world settings" (p.280).

agency theory assumes that agents are opportunistic and may engage in self-serving behaviour if opportunities arise (Ekanayake, 2004), consequences may arise for auditor independence and audit quality.

Agency theory assumes that directors are very powerful people in company affairs and this power is compounded when the same people serve on the boards of more than one company (Rolfe, 1967). The more directorships a person holds, the more likely it is that a director can directly influence corporate policy including the strategies, structure and performance of the company (Rolfe, 1967; Granovetter, 1985). It is also assumed that the board of directors is the first line of defence for shareholders against incompetent management (Weisbach, 1988). In a director–auditor interlocking situation, the large number of clients from interlocking links may work as collateral for auditors, which serves as an incentive for auditors to maintain auditor independence across linked companies. Further to this line of thinking, Marnet (2007) argues that members of the board of directors and external auditors are thought to care about their reputations, future incomes and their prospects in the job market, which may motivate them to maintain their independence in linked companies.

On the other hand, interlocking directorates may reduce the monitoring capacity of directors due to the time commitment aspect (McNulty, 2007) and a large number of benefits in linked companies. A director who has more than one directorship may have little time to look at issues carefully to provide constructive direction. Hunton and Rose (2008) suggests that interlocking (busy) directors are more likely than non-interlocking (non-busy) directors to compromise their independence in the face of restatement decisions. A director who sits on more than one board at a time enjoys more benefits[11]

[11] There are also more likely to be more costs, e.g. stress, time deprivation, bad publicity in the event of malfeasance.

such as financial remuneration, prestige and reputation etc. compared to a director who sits on a single board. In addition, directors generally wish to be re–elected, and might also wish to be elected to the boards of other companies (Marnet, 2004). Hunton and Rose (2008) provides evidence that independent directors, particularly, interlocking (busy) directors, might pursue self-interests when making accounting choices, if they believe they might suffer serious financial and reputational harm. Directors may feel comfortable in retaining the same audit firm/partner for a longer period due to their familiarity and close relationship with the auditor in linked companies. These issues may negatively affect auditor independence and audit quality.

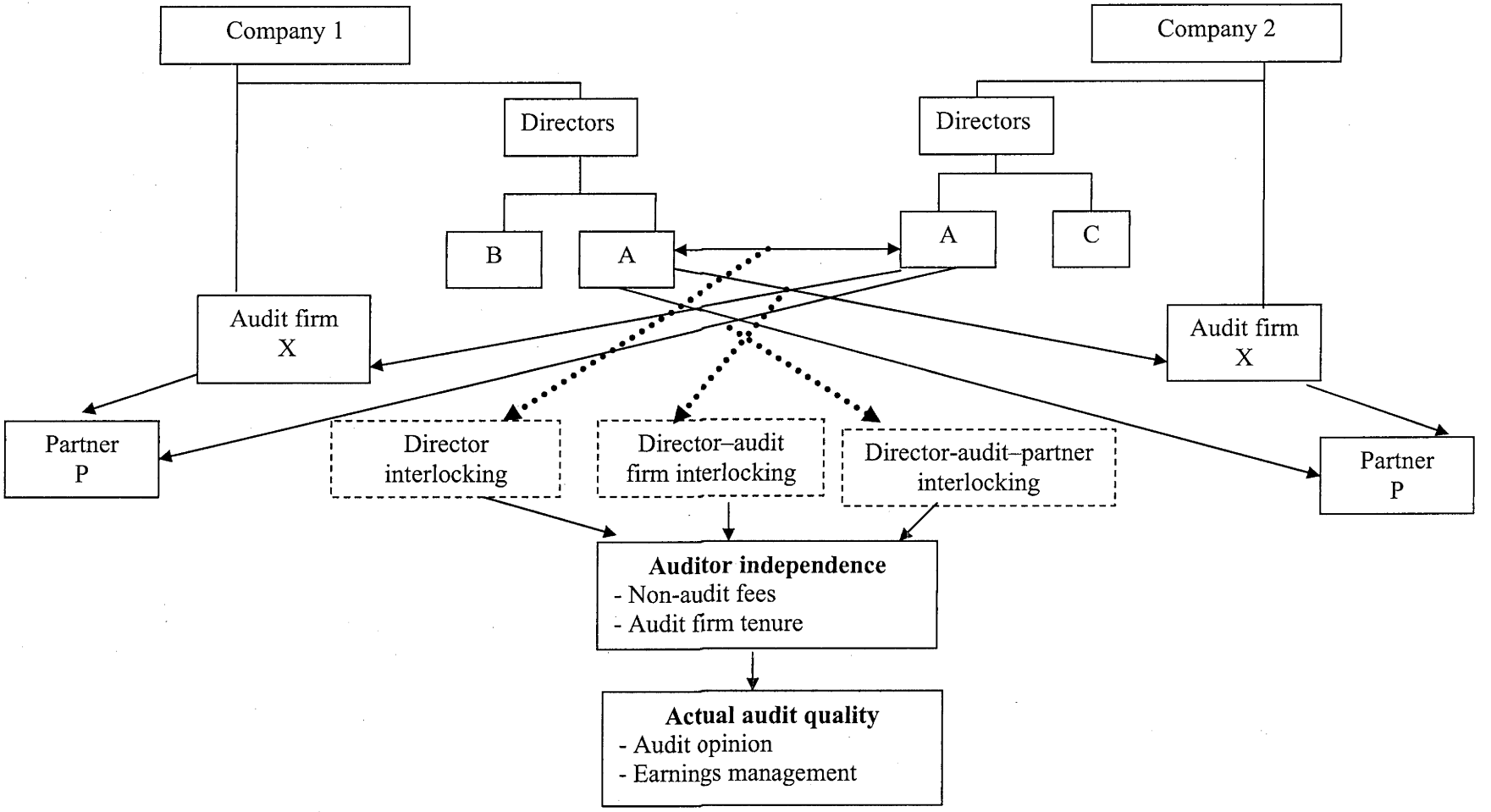
Audit committee and audit firm/partner interlocking may also affect auditor independence and audit quality. Audit committee member–audit firm/partner interlocking may play a vital role in ensuring auditor independence and improving audit quality because members of audit committees may have more extensive audit knowledge due to working on more than one company's audit committee, and tend to defend auditors in accounting conflicts and protect against financial irregularities (DeZoort and Salterio, 2001; Ramsay Report, 2001; DeZoort *et al.*, 2002). Audit committee member–audit firm/partner interlocking may create a perception of enhanced auditor independence and more reliable financial reporting among financial statement users due to the potential effect on the relationship between the external auditor and management (Gwilliam and Kilcommins, 1998). Koh *et al.* (2007) argues that independent and active audit committees and independent boards are important governance attributes for financial reporting. Epps and Ismail (2009) argues that stronger corporate governance (board independence and audit committee independence) mechanisms provide greater monitoring of the financial accounting process and may be important factors in improving the integrity of financial reporting.

In contrast, interlocking relations between the audit committee and the audit firm/partner may degrade auditor independence and audit quality due to their close relationships, which may develop over time with frequent meetings held amongst the linked companies. Ezzamel and Watson (1997) expresses doubt about the ability of audit committees to guarantee auditor independence and argues that if independence is conceptualised as a personal characteristic of an individual, the capacity of one group of people to contribute to the independence of another is questionable.[12] In the interlocking environment of audit committee members, there may be a possibility that, given their increased duties in linked companies, audit committee members may face an overload of responsibilities that could adversely affect their performance. Audit committee member–audit firm/partner interlocking may also degrade auditor independence because the auditor may try to satisfy the audit committee members to increase the likelihood of securing or maintaining engagements in all or at least some of the linked companies. The familiarity and the likely close relationship of the audit firm/partner with the audit committee members, participation of the audit committee in the appointment, removal and remuneration of auditors, the content and extent of audit work and the auditor's dependence on the fee revenue from the linked companies, may influence the auditors'/partners' behaviour, which could decrease auditor independence and degrade audit quality.

Diagram 1 shows the associations between interlockings and APNAS fees, audit firm tenure, opinion and earnings management for this study. It shows that director 'A' sits on both companies, 1 and 2, and creates multiple directorates or director

[12] Researchers also argue that the adoption of audit committees may be primarily symbolic (Kalbers and Fogarty, 1998; Beasley *et al.*, 2009) and that the benefits associated with them are more rhetorical than substantive (DeZoort, 1997; Turley and Zaman, 2004). Turley and Zaman (2004) also argues that: "interestingly the auditors believed that audit committees are not effective and not powerful enough to resolve contentious matters with management" (p. 316).

Diagram 1: Relationships between director–audit firm/partner interlocking and auditor independence and audit quality



interlocking. If both companies are audited by a common audit firm, 'X', it creates a director–audit firm interlocking.[13] When a common audit partner, 'P', from audit firm 'X' audits both companies, it creates a director–audit partner interlocking. Similar types of relationships can be created between the audit committee members and the audit firm/partner when concurrent membership of their companies' audit committees occurs.[14]

This study hypothesises that links between director and director–audit firm/partner in other companies are associated with APNAS fees and audit firm tenure. If interlocking associations influence APNAS fees and audit firm tenure, these interlockings may also affect the auditor's decision about what type of opinion should be issued on the financial statements. Due to the expectation of higher APNAS fees and extended engagement tenure in linked companies compared to non–linked companies, an auditor may be less likely to issue a qualified audit report when it is deserved and may accept financial reports with manipulated earnings for linked companies.

The first and second hypotheses in each set of hypotheses below deal with director interlocking or audit committee member interlocking alone (i.e. without necessarily having a common auditor). For APNAS (Hypotheses 1a, d) it is argued that the business scan capability that multiple directorships/audit committee memberships bring help those parties evaluate the reputation of and potential independence issues with specific non-audit service providers. Hence there can be expected to be an association between interlocking and APNAS even in the absence of a common audit

[13] Director interlocking companies may not be audited by the same audit firm, and if this is the case, there is no director–audit firm interlocking. To create director–audit partner interlocking, there must first be director–audit firm interlocking.

[14] Audit committee member interlocking has not been shown in the framework because this study uses the same procedure to measure audit committee member interlocking, audit committee member–audit firm/partner interlocking as relationships created between directors and audit firm/partner.

firm. Similar arguments can be applied to OPINION (Hypotheses 3a, d) and DACC (Hypotheses 4a, b). For AFTENURE (Hypotheses 2a, d), a different argument applies. In this case, since research shows there is a tendency to link common directors with a common audit firm, it can be expected (although not yet tested) that where different auditors are engaged across the linked companies, there will be a tendency to move to a common auditor, so affecting auditor tenure. The following sections develop the hypotheses of this study.

2.2 DEVELOPMENT OF HYPOTHESES

2.2.1 AUDITOR PROVIDED NON–AUDIT SERVICES FEES

A large body of empirical studies concerning the impact of APNAS fees on auditor independence argue that extensive fees paid to auditors for APNAS increase the financial reliance of the auditor on the client, thus reducing the auditor's independence (Magee and Tseng, 1990; Becker *et al.,* 1998; Larcker and Richardson, 2004). Audit firms that provide more APNAS to their clients are even more likely to be in a weaker position of maintaining independence towards their clients (Chai and Jubb, 2000). Interlocking relations can be used by auditors as an opportunity to sell more APNAS because auditor–client relationships are an important marketing tool for auditors to maintain existing service and promote cross–selling of APNAS (Clark and Payne, 1994; Huntley, 2006). Auditors may gain more clients and earn more APNAS fees from a family of linked companies due to interlocking relations compared to auditors of non–linked companies.

Joint provision of audit and APNAS increases economic bonding/dependence of the auditor and the relationship between auditor and client may become too close, adversely affecting auditor independence (Beattie and Fearnley, 2002). This economic

dependence may increase as the number of interlocking links increases. In other words, the involvement of the auditor in the supply of APNAS reduces the probability of truthful audit reporting if the APNAS work generates economic dependence and impairs auditor independence (Simunic, 1984; Schatzberg *et al.,* 1996). Audit firms working with common directors/audit committee members in linked companies may establish close relationships with them. Ye *et al.* (2006) argues that a close relationship developed at both the firm level and at the interpersonal level is essential in the successful selling of APNAS. Interlocking directors and/or audit committee members may purchase more APNAS from the incumbent auditor and offer higher APNAS fees to create additional economic pressure on the auditor than would otherwise be the case. At the same time, auditor has more opportunity to cross sell of APNAS in linked companies.

Therefore, the first proxy for measuring auditor independence is auditor provided non–audit services (APNAS) fees, which is the most commonly used proxy in the literature (e.g., Graeme, 1994; DeFond *et al.,* 2002; Frankel *et al.,* 2002; Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Hoitash *et al.,* 2005; Chen *et al.,* 2005; Ye *et al.,* 2006; Gul *et al.,* 2007; Cahan *et al.,* 2008; Huang *et al.,* 2008). Prior studies examine the perceptions of individuals as to whether APNAS affect perceptions of auditor independence and some of them provide evidence consistent with APNAS provision impairing perceptions of auditor independence (e.g., Lindsay *et al.*, 1987; Bartlett, 1997; Beattie *et al.*, 1998; Joshi *et al.,* 2007; Huang *et al.,* 2008). Other studies, however, report that APNAS provision does not affect perceptions of auditor independence (e.g., Firth, 1980; Gul and Yap, 1984; Pany and Reckers, 1984; Gul, 1989; Hussey, 1999).

A large number of studies seek to uncover the consequences of APNAS on auditor independence (e.g., Graeme, 1994; DeFond *et al.,* 2002; Frankel *et al.,* 2002; Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Hoitash *et al.,* 2005; Chen *et al.,* 2005; Ye *et al.,* 2006; Gul *et al.,* 2007; Cahan *et al.,* 2008; Huang *et al.,* 2008). Graeme (1994) finds that auditors are less likely to qualify the audit opinion on a company's financial statements when higher levels of APNAS fees are derived, which is an indication of impaired auditor independence. However, DeFond *et al.* (2002) does not find a significant association between APNAS fees and impaired auditor independence, where auditor independence is surrogated by auditors' propensity to issue going–concern audit opinions. Ye *et al.* (2006) investigates the association between going–concern audit opinions and APNAS and finds a significant negative association. Their results are consistent with the argument that APNAS are a potential threat to auditor independence.

Frankel *et al.* (2002) reports a positive and significant association between APNAS fees and the absolute value of discretionary accruals, which is also consistent with an argument that APNAS impairs auditor independence and audit quality. Ashbaugh *et al.* (2003) finds a significant and positive association between APNAS fees and the absolute value of discretionary accruals. Ashbaugh *et al.* (2003) reports that the poorly performing companies paid higher APNAS fees and that the payment of higher APNAS fees by these companies may threaten auditor independence.

Hoitash *et al.* (2005) finds a significant and positive association between APNAS fees and the absolute value of discretionary accruals and argues that the economic bonding is the primary determinant of auditor behaviour, which in turn may lead to a breach in auditor independence. Chen *et al.* (2005) investigates auditor independence in auditor–client negotiation over financial reporting issues and finds a

significant negative relation between APNAS fees and the extent to which the client agreed with the auditor over the financial reporting issues. Their findings are consistent with APNAS fees reducing auditor independence. Gul *et al.* (2007) finds a positive association between APNAS fees and positive discretionary current accruals and argues that APNAS fees may impair auditor independence when auditor tenure is short and not when auditor tenure is long. Cahan *et al.* (2008) does not find a relationship between APNAS fee growth rates or the length of time of the APNAS fee relationship with the client and discretionary accruals.

Prior studies, therefore, report consistent evidence that higher APNAS fees impair auditor independence. The results of the current study will be interpreted in the light of prior studies. A significant positive (negative) association between interlockings and APNAS fees will be interpreted as impaired (enhanced) auditor independence because interlocking companies may purchase more APNAS or offer higher APNAS fees to pressure the auditor to work in their companies' favour. The following sections develop the hypotheses related to APNAS fees and interlockings.

2.2.1.1 Director interlocking, director–audit firm/partner interlocking and APNAS fees

The provision of non-audit services by incumbent auditors in linked companies may provide benefits for both auditors and clients. The interlocking auditor has experience and knowledge about the business of linked companies due to the provision of auditing services, and directors may expect that experienced auditors are more capable of providing superior, more focused and effective APNAS than other parties, which may motivate the interlocking directors to purchase more APNAS that might otherwise be the case. Appointing someone other than the incumbent auditor to provide APNAS for the linked companies could give rise to considerable setup costs and other

risks (Ye *et al.,* 2006). The setup costs include the costs of searching for an appropriate supplier, and risks include the lack of familiarity of the auditor with the business and the probability of receiving low quality APNAS, which comes from the lack of past interactions that demonstrate the supplier's ability (Ye *et al.,* 2006). Abbott *et al.* (2003) argues that the client's management may prefer to use the incumbent auditor for APNAS for two reasons. First, management/directors may want to attain cost savings associated with using the incumbent auditors (Beck *et al.*, 1988) and second, they may want to create additional economic pressure to allow management enough flexibility to attain its goals (Williams, 1988).[15] Thus, directors of linked companies may purchase APNAS from an incumbent auditor for linked companies in order to reduce setup costs and increase the economic dependence of the auditor.

Alternatively, directors of linked companies may limit the purchase of APNAS due to their concerns over auditor independence (Lee, 2008). Prior research suggests that interlocking directors acquire knowledge capital by serving on more than one board and stand to suffer the greatest penalties when there are signal of monitoring failure (e.g., Keys and Li, 2005; Linn and Park, 2005; Srinivasan, 2005; Hunton and Rose, 2008). Lee *et al.* (2004) argues that in situations involving the possibility of loss of auditor independence, there may be incentives for the entire board of directors to prevent such occurrences. CLERP 9 (2004) also requires that board of directors take responsibility for signing off that APNAS has not impaired auditor independence. The above arguments indicate that the number of director interlocks and director–audit

[15] Marnet (2004) argues that "in the case of the Andersen/Enron relationship, it was the Houston partners who primarily dealt with this client. The compensation of these partners was significantly tied to Enron billings both for auditing and consulting services and Enron was likely the largest client of this office. Losing this client would have been catastrophic to the Houston office. The forces that can help undermine the independence of the firm are, thus, possibly magnified in the case of the relationship partners. The consequent threat to the partner's independence and the resulting risk to the auditing firm's reputation are foreseeable" (p. 273).

firm/partner interlocks may be positively[16] or negatively associated with APNAS fees and that is why the following hypotheses are presented as non–directional:

H1a: *Director interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

H1b: *Director–audit firm interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

H1c: *Director–audit partner interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

2.2.1.2 Audit committee member interlocking, audit committee member–audit firm/partner interlocking and APNAS fees

As an independent and active financial monitor, audit committees have incentives to limit APNAS fees paid to an incumbent auditor to improve auditor independence and hence perceptions about the effectiveness of the audit committee (Levitt, 2002; ASX, 2003). The audit committee should assess the independence of the external auditors and report to the board as to whether the audit committee is satisfied that auditor independence has been maintained with regard to the provision of APNAS (ASX, 2003). Abbott *et al.* (2003) argues that an audit committee can either directly or indirectly influence the APNAS purchase decision. Under the direct impact scenario, the perceived threat to auditor independence could be enough for an active and independent audit committee to actively monitor and influence the company's APNAS

[16] If a positive relation between APNAS and interlockings is found, it may suggest that audit firms/partners who face an interlocking relation may have a tendency to sacrifice their independence for APNAS fees.

purchase decisions (Abbott *et al.*, 2003). In the case of audit committee member interlocking and audit committee member–audit firm/partner interlocking, audit committees may limit the purchase of APNAS for linked companies to improve auditor independence (both actual and perceived) and their image as independent monitors in linked companies compared to non–linked companies.[17] Abbott *et al.* (2003) reports that audit committees comprises solely of independent directors are significantly and negatively associated with the APNAS fee ratio (ratio of APNAS fees to total audit fees). This evidence is consistent with the argument that audit committees take action to limit the purchase of APNAS to improve perceptions of auditor independence (Abbott *et al.*, 2003).

In contrast, audit committee members may recommend purchasing APNAS from the incumbent auditor due to the auditor's familiarity and long established work experience in linked companies. Auditors also have frequent meetings and interactions with the members of audit committees in linked companies compared to non–linked companies, which may provide opportunities for the auditors to sell more APNAS to linked companies. The above arguments indicate that the number of audit committee member interlocks, audit committee member–audit firm/partner interlocks may increase or decrease APNAS fees, which may affect auditor independence positively or negatively and that is why the following hypotheses are presented as non–directional:

H1d: *Audit committee member interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

[17] Audit committees may have these incentives regardless of interlockings but perhaps have more of the same incentives if there are interlockings.

H1e: *Audit committee member–audit firm interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

H1f: *Audit committee member–audit partner interlocking is associated with auditor provided non–audit services fees paid to the incumbent auditor after controlling for factors that are likely to affect APNAS fees.*

2.2.2 AUDIT FIRM TENURE

Prior research suggests that short auditor tenure could undermine audit quality due to a lack of client–specific knowledge or pressure to retain and profit from new clients (e.g., Geiger and Raghunandan, 2002; Johnson *et al.,* 2002). In contrast, professional accounting bodies are concerned that longer term auditor–client relationships may impair audit quality and are a threat to audit independence because the longer the relationship, the more likely auditors are to agree to their client's accounting and reporting choices in order to retain the client (AICPA, 1978, 1992; ICAA and CPA Australia, 2001).

The current study argues that when there is a relationship between a director and/or audit committee member and an audit firm through one engagement, this relationship can be used to 'market' the audit firm to other boards of which the director is a member (Houghton and Jubb, 2003). Among these linked companies, directors, audit committee members and auditors may develop personal relationships over time and these personal ties are important for the maintenance of long–term auditor–client relationships (Courtney and Jubb, 2005; Ye *et al.,* 2006). The auditor–client relationship may also be determined by the audit partner's interpersonal relationships with clients (Czepiel, 1990) and this type of relationship is a strong determinant of continuing the

services (Frankwick *et al.,* 2001) in the linked companies. The relationships between director and auditor may result in an alignment of decisions made by each over time because there may be a tendency for the auditor to gradually align with the wishes of management. This alignment may encourage management to continue engagements with the incumbent auditor (Geiger and Raghunandan, 2002) in the linked companies. A long–term association between directors and the auditor in linked companies may threaten auditor independence (Hoyle, 1978) because lengthy audit firm tenure leads to a reduced propensity for issuing qualified audit reports (Barkess and Simnett, 1994; DeFond *et al.,* 2002; Geiger and Raghunandan, 2002; Carcello and Nagy, 2004), a higher level of discretionary accruals (Ashbaugh *et al.,* 2003; Chung and Kallapur, 2003; Myers *et al.,* 2003) and a higher frequency of annual report restatement (Kinney *et al.,* 2004; Raghunandan, *et al.,* 2003; Myers *et al.,* 2005).

Therefore, the second proxy for measuring auditor independence is audit firm tenure with the current auditee, which is also a commonly used proxy (e.g., DeFond and Subramanyam, 1998; Geiger and Raghunandan, 2002; Johnson *et al.,* 2002; Ghosh and Moon, 2003; Myers *et al.,* 2003; Carcello and Nagy, 2004; Mansi *et al.,* 2004; Courtney and Jubb, 2005; Hamilton *et al.,* 2005; Gul *et al.,* 2007; Jackson *et al.,* 2008). These studies are based on the idea of mandatory auditor rotation as a possible solution to the auditor independence problem and argue that imposing limits on auditor tenure is expected to improve auditor independence and audit quality by reducing client influence over auditors (Brody and Moscove 1998; Ghosh and Moon, 2003). Prior studies report a negative association between lengthy audit firm tenure and likelihood of issuing a qualified audit report (Geiger and Raghunandan, 2002; Johnson *et al.,* 2002; Ghosh and Moon, 2003; Myers *et al.,* 2003; Carcello and Nagy, 2004) and a positive association

with a higher level of discretionary accruals (Myers *et al.,* 2003; Chung, 2004; Davis *et al.,* 2009), which may be an indicator of impaired auditor independence.

There are few studies that examine the association between director–auditor links and auditor tenure (e.g., Levinthal and Fichman, 1988; Seabright *et al.,* 1992; Courtney and Jubb, 2005). Levinthal and Fichman (1988) uses the technique of event–history analysis to examine the duration of dyadic interorganisational attachments through a study of auditor–client relationships. Their study finds that these attachments have positive duration dependence and, in the early stages of these attachments, the rate at which these interorganisational relationships ended increased with time. Their study also finds that the rate of switches associated with attachments of a few years' duration is relatively low and that the greatest rate of switching is associated with attachments of four years' duration, with the frequency of switching declining for attachments of longer duration. Their study argues that both the auditor and the client develop relationship–specific skills over time through learning by doing, and that such relationship–specific capabilities create an incentive for both sides to continue the auditor–client relationship for longer periods, which may impair auditor independence.

In a study on the role of individual attachments and the dissolution of auditor–client relationships, Seabright *et al.* (1992) finds that a change in a client's resource needs increases the likelihood of their switching auditors, but that attachment of individuals primarily responsible for the exchange relationship decreases the likelihood of switching. Their study reports that an important consequence of the dyadic attachment between the auditor and the client is the impact of the relationship features on auditor performance and audit quality and that a long–lived relationship may be at

greater risk of performance problems with respect to audit quality and reduced auditor independence.

Courtney and Jubb (2005) investigates the association between director–auditor interlocks and auditor tenure and finds that the director–auditor links are positively associated with auditor tenure and retention of auditors beyond the critical four year period identified by Levinthal and Fichman (1988). Courtney and Jubb (2005) argues that the pressure for mandatory auditor rotation on the grounds of ensuring actual or perceived independence may gain momentum if auditor tenure is accompanied by director–auditor links.

The current study examines the direction of association between interlockings and auditor tenure and any significant association can be interpreted in the light of the findings of existing studies. A significant positive (negative) association between interlockings and audit firm tenure may be interpreted as a decrease (increase) in auditor independence. The hypotheses related to audit firm tenure and interlockings are given in the next sections.

2.2.2.1 Director interlocking, director–audit firm/audit partner interlocking and audit firm tenure

There are many factors that influence the length of auditor tenure, for example, personal relationships, auditor dependence on auditees and development of mutual dependence and trust. Among them, interpersonal associations between the directors and auditors in linked companies may diminish the pressure for auditor changes (Courtney and Jubb, 2005). The relationships established over time in the presence of common director and auditor links allow the development of mutual dependence due to

the greater stability of the alliance and it can be hypothesised that the trust and dependence manifested in the auditor–client relationship in linked companies will be influential in client decisions to retain the auditor for a longer period (Levinthal and Fichman, 1988; Courtney and Jubb, 2005).

De Ruyter and Wetzels (1999), using the concept of relationship marketing, finds that trust and pleasant business relationships increased the commitment of clients to the relationships and their intention to continue them. Seabright *et al.* (1992) argues that attachments between client and auditor organisations occur mainly at the individual level. Their findings suggest that while other factors may act as pressure for auditor change, it is the personal attachments that ease the impact of these influences which are critical to the maintenance of long–term relationships. Courtney and Jubb (2005) finds a significant positive association between director–auditor links and audit firm tenure. Their study argues that the personal association between directors and auditors seems important for the maintenance of long–term relationships in linked companies as compared to non–linked companies. It can also be argued that in a situation of director and audit partner interlocking, the partner has more to lose than if interlocking is not present and so will expend more effort keeping directors happy, which may result in longer audit firm tenure in the linked companies.[18] The greater the number of links an auditor has with other companies, the more the auditor has to lose due to a large number of audit engagements, therefore, an auditor may try to continue an audit engagement in the linked companies for a longer period. Auditor tenure may also be longer in the linked companies because lengthy tenure may cause the auditors to develop 'over–cosy relationships' as well as strong loyalties or emotional relationships with their clients

[18] Holtzman (2004) argues that there is intense pressure on audit partners to bring in significant revenue from audit clients and there is extreme pressure to keep clients happy even at the expense of sacrificing the application of sound accounting practice. Zeff (2003) and Holtzman (2004) also argue that audit partners are given perverse incentives by the firm's top management to modify the client's demands, requests and desires as the clients are driven by their own perverse incentives.

(Flint, 1988; Nasser *et al.,* 2006), which may encourage both parties to continue their relationships.

Furthermore, a long–term relationship and extensive interactions between directors and auditor in linked companies may result in a troublesome degree of closeness between management and the auditor (Arel *et al.*, 2005). Auditors should avoid situations that may lead them to become over–influenced or to be too trusting of the client's directors and key personnel which could consequently lead to audit staff being too sympathetic to client interests (Institute of Charted Accountants in England and Wales (ICAEW), 2001), which may shorten auditor tenure in linked companies. Thus, interlocking directors may recommend changing the auditor more frequently to improve auditor independence and hence the audit firm tenure might be shorter in this instance.

The above arguments indicate that the number of director interlocks, director–audit firm/partner interlocks may increase or decrease audit firm tenure and that is why the following hypotheses are presented as non–directional:

H2a: *An association exists between director interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

H2b: *An association exists between director–audit firm interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

H2c: *An association exists between director–audit partner interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

2.2.2.2 Audit committee member interlocking, audit committee member–audit firm/partner interlocking and audit firm tenure

An audit committee should report to the board on the selection and appointment or removal of the external auditor, and on the rotation of external audit engagement partners (ASX, 2003). The Ramsay Report (2001) recommends that the audit committee should "make recommendations to the board on the appointment, reappointment or replacement, remuneration, monitoring of the effectiveness, and independence of the auditor" (p. 16). Beasley *et al.* (2009) and Cohen *et al.* (2009) find that the audit committee has a significant influence in appointment and dismissal decisions with respect to auditors. Therefore, audit committees play a very important role in the decision to select/retain or change an auditor. An individual, who is a member of more than one audit committee, may have more influence on the auditor selection/removal decision role due to his/her involvement in audit committees in other companies compared with a situation where he/she is on only one audit committee. The audit committee may recommend the same auditor for linked companies due to members' familiarity, close relationships, knowledge/experience of working with the auditor.

Furthermore, audit firm tenure may be affected by the familiarity, friendship, trust and social support that emerges from repeated alliances between the same parties (Gulati, 1995) and may increase with the number of customer/service provider relationships (Ring and Van de Ven, 1989; Parkhe, 1993). In the case of audit committee member–audit firm/partner interlocking, there will be more frequent meetings with the same audit committee members and audit firm/partner in linked companies than without such an interlocking, which may create a close personal relationship between the parties. These personal relationships and familiarity among the parties may enhance the possibility of retaining the auditor for longer periods in linked

companies than would otherwise be the case. In addition, as a member of audit committees of several companies, he/she may observe numerous auditors and may feel comfortable in working with a particular auditor with whom he/she has good relationships. Additionally, to gain more audit clients from the audit committee members' interlocking companies and retain engagements for a longer period, the auditor may try harder than in the absence of such interlocking to satisfy and maintain a good relationship with the audit committee members. The auditor's motivations in securing audit engagements with as many as possible from the linked companies and the personal relationship between the auditor and the audit committee members may serve to increase audit firm tenure.

Alternatively, the audit committee may recommend changing audit firm more frequently to improve auditor independence. Lee *et al.* (2004) finds that independent audit committees demand higher auditor reputation, even though managers may want to remain with the existing auditor because of the independence issue.[19] Thus, the association between the number of committee member interlocks and audit committee member–audit firm/partner interlocks may be positively or negatively related to audit firm tenure. Therefore, the following hypotheses are tested without predicting direction of association between interlockings and audit firm tenure:

H2d: *An association exists between audit committee member interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

[19] Chen and Zhou (2007) argues that even though managers may have wanted to remain with Andersen if it survived, independent directors were more likely to seek the dismissal of Andersen because they demanded higher auditor reputation.

H2e: *An association exists between audit committee member–audit firm interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

H2f: *An association exists between audit committee member–audit partner interlocking and audit firm tenure after controlling for factors that are likely to affect audit firm tenure.*

2.2.3 AUDIT OPINION

An auditor's dependence on a specific client or a group of clients may decrease auditor independence, which could degrade audit quality. An auditor's dependence on fees becomes an issue when a large proportion of the gross fees of a practice are received from one client or family of group of clients and the client may then exert undue influence or pressure on the auditor (Ramsay Report, 2001). Auditors can expect to earn more revenue from a family of linked companies than from a single client in terms of both audit and APNAS fees. Auditors' motivation for continuing an audit engagement, earning revenues and gaining more clients from a family of linked companies may influence their behaviour[20], which could motivate them not to qualify the audit reports of linked companies when a qualified opinion is warranted.

Prior studies report that interlocking companies tend to choose a common auditor (e.g., Davison *et al.,* 1984; Jubb and Houghton, 1999; Jubb, 2000) and this tendency may influence a decision of the auditor regarding whether or not to issue a qualified audit opinion for the linked company. Houghton and Jubb (2003) argues that if the audit firm seeks to qualify the opinion on the accounts of one auditee within a family of companies linked by shared directors, the decision may be moderated by

[20] Marnet (2004) argues that the desire to win future auditing contracts or to cross-sell non-audit services suffices to influence judgement and the mere fact of the auditor being an agent of the audit client leads to judgements favourable to the client.

concerns about the loss of multiple clients. Additionally, if a board does not agree with an auditor, they may switch the auditors of linked companies for which they have an interlocking relationship (Jubb and Houghton, 1999).

Therefore, the first proxy of the current study for actual audit quality is the likelihood of issuing a qualified audit opinion by the incumbent auditors. Several studies use the type of audit opinion as a proxy for measuring audit quality (e.g., Graeme, 1994; Wines, 1994; McMullen and Raghunandan, 1996; Pringle and Bushman, 1996; Craswell, 1999; Carcello and Neal, 2000; Jubb, 2000; Sharma and Sidhu, 2001; DeFond *et al.,* 2002; Abbott *et al.*, 2004; Choi and Doogar, 2005; Jackson *et al.,* 2008; Lai and Gul, 2008). Some of these studies do not find significant association between going–concern opinion and APNAS fees (e.g., Pringle and Bushman, 1996; Craswell, 1999; DeFond *et al.*, 2002).

Graeme (1994) finds that the auditors of companies not receiving an audit qualification of any type over the period derived a significantly higher proportion of their remuneration from APNAS fees than did the auditors of companies receiving at least one audit qualification. This finding indicates that auditors are less likely to qualify a given company's financial statements when higher levels of APNAS fees are derived and this is an indication of reduced audit quality. Lennox (1999) finds a positive weakly significant association between audit qualifications and disclosed APNAS fees.

Wines (1994) and Firth (2002) find that APNAS fees were associated with a lower incidence of audit qualifications or modifications. However, Barkess and Simnett (1994) finds no association between APNAS fees and the type of audit reports issued. Sharma and Sidhu (2001) investigates whether the proportion of APNAS fees to total

fees is associated with the propensity to issue a going–concern qualification in the year preceding bankruptcy and finds a positive relationship. Their finding suggests that higher APNAS fees reduce the likelihood that a qualified report will be issued. Basioudis *et al.* (2008) finds that the magnitude of APNAS fees is significantly associated with the issuance of a going–concern modified audit opinion.

Jackson *et al.,* (2008) investigates the effect of audit firm rotation on auditor independence and audit quality where audit quality is proxied by the propensity of issuing going–concern audit reports. Their study finds that audit quality increases with audit firm tenure because auditor–client linkage increases the likelihood of the auditor issuing a going–concern audit opinion. Contrary to this, other prior studies report that lengthy audit firm tenure leads to a reduced propensity to issue a qualified audit report (Geiger and Raghunandan, 2002; Johnson *et al.,* 2002; Ghosh and Moon, 2003; Myers *et al.,* 2003; Carcello and Nagy, 2004).

There are few studies that investigate the relationship between audit committee characteristics and audit opinion. Abbott *et al.* (2004) finds that companies with audit committees composed of independent directors are less likely to be sanctioned by the USA Securities and Exchange Commission (SEC) for fraudulent or misleading financial reporting. Carcello and Neal (2000) finds that the greater the percentage of affiliated inside or grey directors on the audit committee, the lower the probability that a financially distressed firm will receive a going–concern opinion from the auditor. McMullen and Raghunandan (1996) finds that companies with financial reporting problems are less likely to have audit committees composed entirely of outside directors. Prior research also investigates the role of corporate governance mechanisms in reducing fraudulent financial reporting and reports a negative relation between

effective corporate governance mechanisms and financial reporting decisions (Beasley, 1996; Dechow *et al.*, 1996; Jiambalvo, 1996). Jubb (2000) finds a significant and negative association between director–auditor interlocks and non–clean audit opinions indicating that companies with a higher number of director–auditor links are less likely to receive qualified audit opinions when a qualification is deserved.

The aim of the audit qualification model used in the current study is to identify the association between interlockings and the likelihood of receiving a qualified opinion. The current study expects a significant negative (positive) association between interlockings and the likelihood of receiving a qualified opinion indicating lower (higher) qualification rates as the number of interlocking links increases, hence lower (higher) audit quality. The following sections develop the hypotheses in relation to audit opinions and their expected associations with interlockings.

2.2.3.1 Director interlocking, director–audit firm/partner interlocking and audit opinion

Director interlocking and director–audit firm/partner interlocking associations may enhance or degrade audit quality. Director–auditor links may enhance audit quality because both directors and auditors have incentives for high quality audits due to their commitment as monitoring authorities. Prior studies argue that the pressure on the auditor to issue an unqualified opinion is related to the perceived and actual costs to the client arising from audit qualification (e.g., Dopuch *et al.*, 1986; Fields and Wilkins, 1991; Loudder *et al.*, 1992; Barkess *et al.*, 2002). Monroe and Teh (1993) argues that the cost of issuing an inappropriate opinion can result in substantial damage through lawsuits, the loss of professional reputation and also could result in the loss of the client.

These factors may motivate the auditors of linked companies to provide high quality audits.

Alternatively, director interlocking and director–audit firm/partner interlocking may degrade/diminish audit quality. These relationships may degrade audit quality because auditors may become compliant for fear of losing not just one audit in linked companies, but other audits where the same directors and auditors are associated (Jubb, 2000). Interlocking directors are also more likely to maintain links with auditors with whom they feel comfortable, even at the expense of unfavourable perceptions of auditor independence (Jubb, 2000). Moreover, the prestige and reciprocation of mutual favours among directors may be more powerful incentives for joining boards than financial benefits (Spencer, 1983; Whisler, 1984). If the directors maximise their own interests rather than the interests of shareholders, they may pressure the auditor to issue unqualified audit reports when they would otherwise receive a qualified opinion.

Furthermore, interlocks are indicators of potential power relationships between companies at the highest level (Pettigrew, 1992). It is hypothesised that the directors of linked companies have more power to influence the decisions of interlocking companies than other directors. In addition, the relationships generated in the presence of director–auditor links allow the development of mutual dependence due to the greater stability of the alliance (Courtney and Jubb, 2005). This alliance may motivate the auditor to issue unqualified opinions for linked companies when they are not deserved. Directors may expect unqualified opinions for all the linked companies to protect their directorships and reputations, and continuance of directors' fees. Auditors may also be tempted to agree to the wishes of management/directors rather than risk being replaced by a more compliant auditor (Goldman and Barlev, 1974).

Auditors may also align with directors' decisions so that they can continue auditing in the linked companies because, unless there is a reason to believe that auditors are different from other economic agents, they also need to be viewed as utility maximisers (Miller, 1992). Auditors are likely to command low levels of power in any conflict situation due to their close relationships, their willingness to continue the audit engagement in linked companies and their financial dependence (on both audit and APNAS fees) on audit clients (Barkess *et al.*, 2002). Jubb (2000) finds that companies exhibiting higher frequencies of director–auditor links received fewer qualified opinions. Hunton and Rose (2008) finds that directors holding multiple directorships are less likely to accept an auditor's restatement recommendation than directors with a single directorship. Their study also reports that directors holding multiple directorships are more likely to compromise their independence in the face of auditors' restatement recommendations than director with a single directorship due to the potential negative effects on their reputational capital. Thus, significant associations are expected between director interlocking and director–audit firm/partner interlocking and the likelihood of issuing a qualified audit opinion by the auditor:

H3a: *Director interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

H3b: *Director–audit firm interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

H3c: *Director–audit partner interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

2.2.3.2 Audit committee member interlocking, audit committee member–audit firm/partner interlocking and audit opinion

It is argued that audit committee member and audit firm/partner interlocking may influence the decision of an auditor to qualify the audit report(s) of linked companies. An auditor may be reluctant to qualify the audit reports of audit committee member linked companies when it is deserved because the auditor may lose the contract with the linked companies. An auditor may also be reluctant to qualify the audit reports of linked companies because audit qualifications would adversely affect the interests of corporate participants including the audit committee members (Ball *et al.,* 1979). Additionally, audit committee members who serve on different audit committees have more experience and may play a vital role in mitigating disagreements on issues related to audit qualification between management and the auditor and, therefore, there may be less need to qualify audit reports of companies linked by audit committee members.

Furthermore, the competence and independence of individual audit engagement partners determine the quality of the audit (Levitt, 2002; Meuwissen *et al.*, 2005). Audit partners involved in engagements covering several companies at a time have more incentives to maintain high audit quality in order to continue auditing the linked companies. Audit committee members who serve on different audit committees may support the auditor in enhancing audit quality due to their independent roles in the organisations. If both the audit partner and audit committee members are performing their independent monitoring roles properly, the relationship between them in linked companies could improve audit quality and, therefore, there would be less need to qualify audit reports. Thus, significant associations between audit committee member interlocking, audit committee member–audit firm/partner interlocking and the likelihood of issuing a qualified audit opinion by the auditor are expected in this study:

H3d: *Audit committee member interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

H3e: *Audit committee member–audit firm interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

H3f: *Audit committee member–audit partner interlocking is associated with the likelihood of receiving a qualified audit opinion after controlling for factors that are likely to affect the audit opinion.*

2.2.4 EARNINGS MANAGEMENT

Interest in the areas of earnings management, corporate governance and audit quality has been keen for many years. Earnings management refers to the use of flexible accounting principles that allow managers to manage reported earnings to show the reported income to be larger or smaller than it would be otherwise (Davidson *et al.*, 2004). Interlocking relationships may be used by management as an opportunity to manage earnings due to the close relationships and familiarity between directors, auditors and management and their frequent interactions in more than one company.

The absolute value of discretionary accruals is used in this study to examine the association of earnings with interlockings. The absolute value of discretionary accruals measure reflects the economic effect of management's accrual decisions regardless of direction (Ruddock and Taylor, 2005). Menon and Williams (2004) argues that:

> "using the unsigned value of abnormal accruals more completely identifies the discretion afforded to managers by their auditors and in this context does not

require assumptions about auditor bias with regard to the directional effect of an accounting choice" (p. 11).

Numerous studies use discretionary accruals as a proxy for financial reporting or earnings quality and hence audit quality (e.g., DeFond *et al.,* 2002; Frankel *et al.,* 2002; Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Hoitash *et al.* 2005; Ruddock and Taylor, 2005; Cameran *et al.,* 2008; Jackson *et al.,* 2008; Lai and Gul, 2008). There are a substantial number of studies on APNAS and earnings management. The results of studies by Reynolds *et al.* (2002), Chung and Kallapur (2003) and Antle *et al.* (2006) establish a negative association between APNAS and the absolute value of discretionary accruals, which does not support the assertion that fees for APNAS increase abnormal accruals, hence diminishing audit quality. Other studies report a positive association between APNAS and the absolute value of discretionary accruals (e.g., Frankel *et al.,* 2002; Ashbaugh *et al.,* 2003; Chen *et al.,* 2005; Hoitash *et al.,* 2005; Ruddock and Taylor, 2005) suggesting that APNAS reduces audit quality.

A number of studies investigate the association between audit firm/partner tenure and earnings management. DeFond and Subramanyam (1998) reports that firms that switch from Big 6 to non–Big 6 audit firms appear to implement more liberal accounting, as evidenced by higher unexpected accruals. Myers *et al.* (2003) finds that higher earnings quality is associated with longer auditor tenure and argues that longer auditor tenure results in auditors placing greater constraints on extreme management decisions in the reporting of financial performance. Davis *et al.* (2002) investigates auditor tenure, auditor independence and earnings management and finds a positive relation between tenure and the absolute value of discretionary accruals. Their study concludes that these findings are consistent with management: (1) gaining greater

reporting flexibility, and (2) being able to meet earnings forecasts more easily as auditor tenure increases, which may reduce audit quality.

Ghosh and Moon (2003) finds that the absolute value of discretionary accruals and the use of large negative special items to manage earnings decline with auditor tenure. These results are consistent with the claim that audit quality improves with auditor tenure. Chung (2004), using a sample of Korean firms, provides evidence that under an audit regime similar to mandatory auditor rotation, audit quality (using discretionary accruals as a measure of audit quality) appears to improve when the duration of the auditor–client relationship is truncated. Jackson *et al.* (2008) investigates the effect of audit firm rotation on auditor independence and audit quality, where audit quality is proxied by the level of discretionary accruals. Their study finds that audit quality increases as audit firm tenure increases.

Some studies investigate the association between audit partner tenure and earnings management. Chen *et al.* (2008) finds that the absolute value of discretionary accruals decreases with the length of audit partner tenure, and the decrease mainly occurs after five to seven years of an audit partner–client relationship. These results do not suggest that earnings quality deteriorates with extended audit partner tenure. Chi *et al.* (2004) finds no evidence that audit tenure has a negative effect on audit quality, at either the audit–partner or the audit–firm level. Cameran *et al.* (2008) examines the effects of auditor tenure and auditor change on audit quality in a unique mandatory audit firm rotation environment (Italy) and finds that audit quality—measured in terms of earnings management—tends to improve rather than worsen over time. Turner *et al,* (2008) finds a significant and negative association between lead audit partner tenure and discretionary accruals. Chi *et al.* (2009), using both absolute and signed discretionary

accruals for Taiwanese companies, does not find that mandatory audit partner rotation enhances audit quality. Jenkins and Velury (2008) documents a positive association between the conservatism in reported earnings and the length of the auditor-client relationship.

Several studies investigate the association between audit committee characteristics, corporate governance characteristics and earnings management. Klein (2002) finds that audit committee independence is negatively associated with abnormal accruals, and reductions in audit committee independence are associated with large increases in abnormal accruals. Using Korean data, Choi *et al.* (2004) demonstrates that the independence and competency of the audit committee is associated with the earnings management. Xie *et al.* (2003) finds that audit committee members with corporate or financial backgrounds are associated with firms that have smaller discretionary current accruals. Their study reports that the audit committee activity and members' financial sophistication may be important factors in constraining the propensity of managers to engage in earnings management.

There are few studies that include board characteristics and investigate their relationship with discretionary accruals. Peasnell *et al.* (2000) documents that earnings management is negatively associated with the independence of the board of directors. Klein (2002) finds a negative relation between board independence and abnormal accruals, and that a reduction in board independence is accompanied by a large increase in abnormal accruals. Xie *et al.* (2003) argues that board activity and the financial sophistication of its members may be important factors in constraining the propensity of managers to engage in earnings management. Jubb (2000) examines whether the absolute value of discretionary accruals is associated with the number of director–

auditor links and reports a significant positive association between director–auditor links and the absolute value of discretionary accruals.

Consistent with Jubb (2000) study, the current study assumes that if interlocking associations between directors and/audit committee members and audit firms/partners compromise auditor independence then discretionary accruals will increase with the increase in number of interlocking links. In contrast, if interlocking links improve audit quality due to auditor–client communication and negotiation, then the number of interlocking links will be insignificant or negative with discretionary accruals (Jubb, 2000). The findings of the current study will be interpreted in the light of the findings of prior studies. A significant positive (negative) association between interlockings and the absolute value of discretionary accruals will be interpreted as a decrease (increase) in audit quality. The following two sections develop the hypotheses in relation to discretionary accruals as the measure of earnings management, and their associations with interlockings.

2.2.4.1 Director interlocking, director–audit firm/partner interlocking and the absolute value of discretionary accruals

Personal relationships established between the directors and the audit firm/partner may be associated with the reported earnings of linked companies. Agency theory identifies the importance of incentives and self–interest in organisational thinking and assumes that "much of organizational life, whether we like it or not, is based on self–interest" (Perrow, 1986; Eisenhardt, 1989, p. 64). If both the directors and auditors are assumed to be self–interested maximisers[21], the manipulation of earnings in

[21] Marnet (2004) argues that "the subjective nature of accounting and the tight relationships between auditing firms and their clients is particularly visible in the dealings of the individual auditing partner and the unconscious biases of the auditor, impartiality is difficult to achieve, some would say impossible, as all individuals are biased towards their own interests or prejudices" (p. 274).

the director–audit firm/partner linked companies is likely to be facilitated by appointing a common audit firm/partner for the linked companies. The motivation for directors to manage earnings may be to show a better financial result for linked companies compared to non–linked companies and to signal their credibility as directors of more than one company.[22] They may pressure the auditor to accept managed earnings by offering financial and/or non–financial incentives. Furthermore, in director–audit firm/partner interlocking relationships, the auditor may identify closely with the management and may not exhibit sufficient professional scepticism. As a results, management may be able to take advantage of the auditor's/partner's conflict by making a personal appeal for compassion and support (Arel *et al.,* 2005).

Additionally, if the auditor is dependent on the client for a substantial portion of their income, the auditor may be more willing to agree with management's representations and interpretations of accounting matters (Firth, 1997a). In director–audit firm/partner interlocking, the auditor may be more dependent on the revenue (audit fees and APNAS fees) from the linked companies compared to non–linked companies.[23] This dependency may increase the auditor's incentive to give in to client pressure, including pressure to allow earnings management. Magee and Tseng (1990) and DeAngelo (1981a) argue that audit quality could be impaired when significant economic rents exist for the auditor's engagement with a client. Kinney and Libby (2002) argues that a strong economic bond between the auditor and the client will

[22] Researchers argue that earnings management may be beneficial because it improves the information value of earnings by conveying private information to the stockholders and the public (Jiraporn *et. al.,* 2006). Jiraporn *et. al.* (2006) also posits that the scandals at Enron, WorldCom and elsewhere have generated a public perception that earnings management is utilised opportunistically by firm managers for their own private benefit rather than for the benefit of shareholders. Thus, the directors/management may be motivated to manage earnings to show a better financial result to the users.

[23] Earlier in this thesis it is argued that the auditor of linked companies may have more clients from a family of linked companies and earn more revenue because the directors tend to choose a common auditor for their linked companies (Jubb and Houghton, 1999).

reduce the quality of reported earnings through auditors' reduced willingness to resist client–induced biases in reported accounting information.

Alternatively, Van Der Zahn and Tower (2004) finds that the presence of independent directors serving simultaneously on a substantial number of boards is effective at constraining earnings management. Prior studies (e.g., Beasley, 1996; Dechow *et al.*, 1996; Klein, 2002; Xie *et al.*, 2003; Peasnell *et al.,* 2005; Mather and Ramsay, 2006) find that outside directors are associated with reduced earnings manipulation, fraud or earnings management. Interlocking associations between directors and audit firm/partner may minimise earnings management due to their commitment as agents of shareholders to monitoring roles and their greater financial and non–financial stakes in linked companies compared to non–linked companies.

The above arguments indicate that the association between the number of director interlocks, director–audit firm/partner interlocks and the absolute value of discretionary accruals may be positive or negative and that is why the following hypotheses are presented as non–directional:

H4a: *Director interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

H4b: *Director–audit firm interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

H4c: *Director–audit partner interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

2.2.4.2 Audit committee member interlocking, audit committee member–audit firm/partner interlocking and the absolute value of discretionary accruals

An active audit committee may be an important monitoring mechanism for improving the accountability of management and the quality of financial reports by minimising earnings management (Xie *et al.*, 2003; Bradbury *et al.*, 2004). Audit committee members sitting on more than one audit committee across other companies may minimise earnings management because audit committee members who sit on more than one audit committee may have more experience and may be in the best position to serve as active overseers of the financial reporting process and have the ability to withstand pressure from management to manipulate earnings (Klein, 2002; Baxter, 2005).

Prior studies report a negative relationship between effective audit committees and earnings management (Klein, 2002). This may also be the case in the presence of audit committee member interlocking and audit committee member–audit firm/partner interlocking because experienced and financially literate individuals are normally appointed to audit committees and they may be more effective at preventing or at least minimising earnings management. Serving on several boards gives audit committee members additional experience and this can enhance their effectiveness in applying this experience to limiting earnings manipulations (Song and Windram, 2004). Furthermore, the external auditor and audit committee members have similar incentives, such as minimising legal liability and desire for a good reputation and therefore similar

incentives to issue high–quality financial reports and these features help to mitigate the mechanism of earnings management (Jenkins, 2002). Audit committee members and the audit firm/partner who serve several linked companies may have more to lose in respect of their reputation if they compromise audit quality. If both parties perform their duties to maximise shareholder interests and to protect their own reputations, their links could improve audit quality by preventing or constraining earnings management

Prior studies relating to audit committees and earnings management use different characteristics of audit committee members to examine their association with discretionary accruals. Klein (2002) reports that audit committee independence is negatively associated with the absolute value of discretionary accruals. Using Korean data, Choi *et al.* (2004) demonstrates that the independence and competency of the audit committee are associated with earnings management. Xie *et al.* (2003) finds that audit committee members with corporate or financial backgrounds are associated with smaller discretionary accruals. Their study reports that audit committee activity and members' financial sophistication may be important factors in constraining the ability of managers to engage in earnings management. Baxter and Cotter (2008) finds higher earnings quality in companies with a greater proportion of qualified accountants on their audit committees. When audit committee members work together with a common audit firm/partner across other companies, they may be more cautious about their reputation, performance and job security, which may motivate them to minimise or constrain earnings management by the linked companies' management.

Alternatively, an audit committee member who sits on more than one audit committee may not be a good monitor of earnings management issues due to time constraints and direct and indirect benefits. Wright (1996) reports that a direct financial interest (such as stock ownership) by audit committee members is positively associated

with earnings management. Audit committee members have more interests in linked companies compared to non–linked companies due to their large stake and involvement in other companies. Auditors also may ignore the earnings management issue due to their close relationships with management and their large stake in linked companies.

The above arguments indicate that the association between the number of audit committee member interlocks, audit committee member–audit firm/partner interlocks and the absolute value of discretionary accruals may be positive or negative and that is why the following hypotheses are presented as non–directional:

H4d: *Audit committee member interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

H4e: *Audit committee member–audit firm interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

H4f: *Audit committee member–audit partner interlocking is associated with the absolute value of discretionary accruals after controlling for factors likely to be associated with discretionary accruals.*

2.3 CHAPTER SUMMARY

This chapter describes the conceptual framework and develops the hypotheses for this study. It is argued in this study that the relationships between directors, audit committee members and the audit firm/partner may enhance or degrade auditor independence and audit quality. Chapter 3 describes the research methods used to investigate whether the interlocking relationships among the parties enhance or degrade auditor independence and audit quality.

CHAPTER THREE
RESEARCH METHOD

3.0 INTRODUCTION

This chapter describes the research methods used to test the hypotheses. It also provides the justifications for the choice of variables included in the models and describes the way these variables are operationalised. A summary of all variables used in testing the hypotheses is provided in Appendix I for ease of reference. This chapter also provides definitions and explanations of the test variables.

3.1 RESEARCH METHOD

The following sections describe the research design for this study followed by definitions and explanations of the test variables and model specification.

3.1.1 *Research design*

Publicly available published financial and corporate governance information for ASX listed companies during the fiscal years 2003–2005 is used in this study to investigate the association of interlocking relationships with auditor independence and audit quality. To examine these issues, two proxies for measuring each of auditor independence and actual audit quality are used in this study.

The first proxy for auditor independence is auditor provided non–audit services fees, and the second proxy is audit firm tenure with the current auditee. To measure audit quality, the first proxy is the likelihood of issuing a qualified audit opinion by the auditor, and the second proxy is the level of earnings management/discretionary accruals tolerated by the auditor. The following sections discuss test variables followed by the models and definitions of variables and the statistical tools used for estimating the models.

3.1.2 Test variables

The test variables for the current study are common for the APNAS fees model, audit firm tenure (AFTENURE) model, audit opinion (OPINION) model and discretionary accruals model (DACC). The definition and implementation of the test variables is described in detail in this section and referred to frequently in subsequent sections due to their importance. The test variables consist of director interlocks (DLKS), director–audit firm interlocks (DAFLKS), director–audit partner interlocks (DAPLKS), audit committee member interlocks (ACLKS), audit committee member–audit firm interlocks (ACAFLKS), and audit committee member–audit partner interlocks (ACAPLKS). The following sections provide an illustration of calculations and definitions of the test variables.

For all of the above interlocking variables, the number of total interlocks created by the boards of directors and/or audit committee members and audit firms/partners with other companies was separately computed, and then the number of common interlocks was calculated. The number of total interlocks means how many of the focal company's board members sit together on the boards of other companies, that is, the total number of interlocks created by the board of directors of a company with other companies. The number of common interlocks indicates that if more than one director from a focal company simultaneously sits on the same other companies' boards, it counts only once (Jubb, 2000). Common interlocks for all of the above test variables[24] are used and the procedure employed by Davison *et al.* (1984), Jubb and Houghton

[24] Jubb (2000) and Jubb and Houghton (1999) explain the calculation procedures of interlocking in detail. Jubb (2000) argues that interlocking links can be measured on a "presence" or "extent of" basis. "The presence of measure takes account of a link to another company once only, regardless how many directors create the link to that company. The "extent of" measure accumulates the links across all directors without attention to whether individual directors sit together on the same (additional) boards" Jubb, 2000, p. 125). Most of the prior literature uses "points to the existence of a directorial or shareholder link between companies, rather than how many times the same link occurs, as important for information dissemination. Hence, it is this "unitary", "unique" or "presence" form of the measure" (Jubb, 2000, p. 125) that is used for all interlocking variables in the current study.

(1999) and Jubb (2000) to calculate interlocking variables is used. Jubb and Houghton (1999) explains that under their method:

> "it is important to note that in operationalising common interlocks, regardless of how many of the focal company's board members sit together on the board of the same other company, the link to that company is counted only once" (p. 11).

The same was done for the audit committee member interlocks and audit committee member–audit firm/partner interlocks. An illustration of the calculations for interlockings is shown in Table 3.1.

Table 3.1
Illustration of the number of director and director–audit firm/partner interlocks

Company	Directors	Audit firm	Audit partner	TDLKS	DLKS	TDAFLKS	DAFLKS	TDAPLKS	DAPLKS
1	A,B,C,D	X	P	5	2	3	1	1	1
2	E,F,G	Y	Q	0	0	0	0	0	0
3	B,D,I,J	Z	R	5	3	0	0	0	0
4	A,B,D,K,L,M	X	P	6	3	4	2	2	2
5	I,M	X	R	2	2	1	1	1	1

TDLKS = total director interlocks, DLKS = (common) director interlocks, TDAFLKS = total director–audit firm interlocks, DAFLKS = (common) director–audit firm interlocks, TDAPLKS = total director–audit partner interlocks, DAPLKS = (common) director–audit partner interlocks.

Total director interlocks (TDLKS) indicates the total number of interlocks created by directors of the focal company with other companies. For example, company 1 has four directors (A, B, C, and D), among them director A sits on company boards 1 and 4. Director B sits on company boards 1, 3, and 4. Director C sits on company 1 board only, and director D sits on company boards 1, 3, and 4. Thus, director A creates one interlock, B creates two interlocks, C does not create any interlock, and D creates two interlocks. The TDLKS is five (1 + 2+ 2). On the other hand, DLKS indicates the number of common interlocks created by the directors of the focal company with other companies. From the above example, directors of the focal company (company 1) A, B and D sit on companies 1 and 4, which counts once only. The same applies for directors

B and D who sit on companies 1 and 4 and counts only once. Thus, the DLKS is two (1+1). Both the TDLKS and DLKS are zero for company 2 because there is no common director for company 2.

Calculation of the total director–audit firm interlocks (TDAFLKS) and common director–audit firm interlocks (DAFLKS) followed a procedure similar to that used by Jubb and Houghton (1999) and Jubb (2000). For example, let us assume there are interlocking relationships between directors in companies 1, 3 and 4. However, only companies 1 and 4 (not company 3) have a common audit firm (audit firm X) thus, creating director–audit firm interlocking. The TDAFLKS created by common directors and the audit firm for company 1 is three (A, B and D) and the DAFLKS is one (counted only once for the common directors). If companies 1 and 3 have a common audit partner from audit firm X, it creates director–audit partner interlocks (DAPLKS). The total number of director–audit partner interlocks (TDAPLKS) is three in companies 1 and 3 (directors A, B and D and partner P) and DAPLKS is one. The same procedures were used for calculating audit committee members and audit firm/partner interlockings. The following sections provide definitions of the test variables.

3.1.2.1 Director interlocks (DLKS)

The term "interlocking directorates" or "director interlocking" or "director interlocks" typically refers to any situation in which two or more corporations share one or more directors in common (Allen, 1974; Stening and Wan, 1984; Stokman and Wasseur, 1985; Zajac, 1988; Mizruchi, 1996; Elouaer, 2006). That means, interlocking is "a connection between one or more companies created by the presence of common directors and such multiple or shared directorships are commonly referred to in the relevant literature as interlocking directorates" (Jubb and Houghton, 1999, p. 2). DLKS is used to refer to the number of companies linked by common directors, that is, the

directors of one board create the number of common links with other companies' boards.

3.1.2.2 Director–audit firm interlocks (DAFLKS)

The links to other companies through common directors that exist for a given or focal company, the tied companies, may or may not be audited by the same audit firm (Jubb, 2000). DLKS are necessary to director–audit firm interlocks (DAFLKS) and for the existence of systematic director–audit firm links to occur the same director must be associated with a common audit firm across a number of companies (Jubb and Houghton, 1999; Jubb, 2000). DAFLKS refers to the number of relationships created between common directors and the audit firm to signify that the audit firm is linked to companies with common directors (Jubb, 2000). DAFLKS is used when the same audit firm coincides across companies on which the same director is a board member.

3.1.2.3 Director–audit partner interlocks (DAPLKS)

DAFLKS are necessary for director–audit partner interlocks (DAPLKS). For a director–audit partner link to occur, the same director must be associated with a common audit partner from a common audit firm over two or more companies. DAPLKS is used as the number of common interlocks created by the common audit partner from the same audit firm with the DAFLKS companies.

3.1.2.4 Audit committee member interlocks (ACLKS)

If a member of the audit committee of one company simultaneously sits on the audit committee(s) of other companies, it creates an audit committee member interlocking (ACLKS). Similar to DLKS, ACLKS indicates the number of links created by audit committee members sitting on other companies' audit committees.

3.1.2.5 Audit committee member–audit firm interlocks (ACAFLKS)

When ACLKS companies are audited by a common audit firm, it creates audit committee member–audit firm interlocking (ACAFLKS). The frequency of ACAFLKS is calculated as the number of common interlocks created between the audit committee members' linked companies and those companies audited by a common audit firm.

3.1.2.6 Audit committee member–audit partner interlocks (ACAPLKS)

When ACLKS companies have a common signing audit partner from the same audit firm, it creates an audit committee member–audit partner interlock (ACAPLKS). ACAPLKS indicates the number of links created by the common audit committee members with a common audit firm and a common audit partner across the other companies.

3.1.3 *Model specification*

3.1.3.1 AUDITOR PROVIDED NON–AUDIT SERVICES FEES

Prior studies have modelled auditor provided non–audit services (APNAS) fees as a function of a company's auditor choice, audit complexity, audit risk, temporal instability, and the demand for consulting services (e.g., Firth, 1997b; Craswell, 1999; Ashbaugh *et al.,* 2003; Ikin, 2003; Ruddock *et al.,* 2004; Ruddock and Taylor, 2005). This study draws on prior research on APNAS fees to identify the control variables considered appropriate when modelling APNAS fees. Specifically, Firth (1997b), Craswell (1999), Ashbaugh *et al.* (2003), Ikin (2003), Ruddock *et al.* (2004) and Ruddock and Taylor (2005) are reviewed to identify variables explaining APNAS fees. The natural log of auditor provided non–audit services (LnAPNAS) fees is the dependent variable for the following APNAS fee model that is used to estimate the

relations between interlockings and APNAS fees paid by the companies to their incumbent auditors:

$$\text{LnAPNAS} = \beta_0 + \beta_1\text{INTERLOCKINGS} + \beta_2\text{LnTA} + \beta_3\text{BIG4} + \beta_4\text{EQUITY} + \beta_5\text{MERACQS} + \beta_6\text{ROA} + \beta_7\text{LEVERAGE} + \beta_8\text{NEG\_ROA} + \beta_9\text{MB} + \beta_{10}\text{INITIAL} + \beta_{11}\text{BDINDP} + \beta_{12}\text{ACSIZE} + \beta_{13}\text{INDEPAC} + \beta_{14}\text{YEAR}_{03\text{-}05} + \beta_{15}\Sigma\text{INDUSTRY} + \varepsilon \quad (1)$$

Where

LnAPNAS = natural log of auditor provided non–audit services fees from individual client;

Test variables

INTERLOCKINGS = interlocking variables, which include: director interlocks (DLKS), director–audit firm interlocks (DAFLKS), director–audit partner interlocks (DAPLKS), audit committee member interlocks (ACLKS), audit committee member–audit firm interlocks (ACAFLKS), and audit committee member–audit partner interlocks (ACAPLKS).[25] Each of the variables is used separately in estimating the model;

Control variables

LnTA = natural log of total assets;

BIG 4 = 1 if a company's incumbent auditor is a BIG 4 audit firm, 0 otherwise;

EQUITY = 1 if the company issues new shares during the current year, 0

[25] Please see sections 3.1.2.1 to 3.1.2.6 for the definitions and explanations of these variables. The terms "director–audit firm" and "director–auditor" interlocking are used interchangeably. Similarly, audit committee member–audit firm and audit committee member–auditor interlocking are used interchangeably. Prior studies (e.g. Jubb and Houghton, 1999; Jubb, 2000) do not use interlocking links with audit partner and hence they used the term "auditor" instead of "audit firm". The current study uses audit partner interlocking with director and/or audit committee member and mentions the links specifically.

otherwise;

MERACQS	=	1 if the company is engaged in a merger/acquisition activity in the current year, 0 otherwise;
ROA	=	operating income divided by average total assets;
LEVERAGE	=	ratio of total liabilities to total assets;
NEG_ROA	=	1 if the firm reports a negative return on assets in the current year, 0 otherwise;
MB	=	market–to–book ratio at fiscal–year–end, defined as market value of equity divided by shareholders equity;
INITIAL	=	1 if the audit firm engagement is in either the first or second year with the current auditee, 0 otherwise;
BDINDP	=	1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
ACSIZE	=	number of audit committee members;
INDEPAC	=	1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
$YEAR_{03\text{-}05}$	=	dummy variables for year of data;
ΣINDUSTRY	=	1 if in the nominated industry group, 0 otherwise; 25 dummies for 26 ASX industry groups.

3.1.3.1.1 Control variables

Previous studies report that APNAS fees are affected by many factors. These factors are treated as control variables in the APNAS fee model. Explanations of the control variables used in the APNAS fee model follow:

Total assets **(LnTA)**

Larger companies have more complex systems and undertake a wider range of activities so they require more APNAS than smaller companies (Palmrose, 1986; Raghunandan *et al.*, 2003). Using Australian data, Morecroft *et al.* (2005) finds that larger companies, as measured by market capitalisation[26], have relatively higher proportions of APNAS relative to total fees compared to smaller companies. Prior studies report a significant positive association between the size of the company measured as total assets, and APNAS fees (e.g., Ashbaugh *et al.,* 2003; Hoitash *et al.,* 2005; Choi *et al.,* 2006; Ye *et al.,* 2006; Griffin *et al.,* 2008). A significant positive association between the size of the entity, measured as the natural log of total assets, and APNAS fees is expected in this study.

Big 4 **(BIG 4)**

There is evidence that BIG 4 audit firms are better placed to provide a range of APNAS and offer a broader array of services than other auditors (Raghunandan *et al.,* 2003). Prior studies report a significant positive association between having a BIG 4/5 auditor and APNAS fees (e.g., Ashbaugh *et al.,* 2003; Hoitash *et al.,* 2005; Choi *et al.,* 2006; Ye *et al.,* 2006; Griffin *et al.,* 2008). Thus, a positive association between APNAS fees and audit firm size is expected in this study. BIG 4 is measured by a dummy variable taking the value 1 if a company's auditor is a BIG 4 audit firm, 0 otherwise.

Issue of equity **(EQUITY)**

Companies issuing new equity[27] require more non–audit services (Firth, 1997b; Abbott *et al.,* 2003; Raghunandan *et al.,* 2003; Ghosh *et al.,* 2005). Firth (1997b) argues

[26] Results for the current study were robust whether using market capitalisation, total assets or total revenue as a measure of entity size.

[27] Data for EQUITY was collected from Annual Cash Flow of the *AspectHuntley* database, named: proceeds from issues.

that using the incumbent auditor to provide these services may be more efficient and effective than hiring external consultants. Prior studies report a significant positive association between EQUITY and APNAS fees (e.g., Firth, 1997b; Abbott *et al.,* 2003; Raghunandan *et al.,* 2003; Ghosh *et al.,* 2005; Hoitash *et al.,* 2005; Choi *et al.,* 2006). Therefore, a positive association between EQUITY and APNAS fees is expected in this study. EQUITY is a dummy variable taking the value 1 if the firm issues new equity during the year, 0 otherwise.

Merger and acquisitions **(MERACQS)**

Companies involved in mergers or acquisitions[28] require additional work to make the merger or acquisition successful (Firth, 2002). These extra consulting activities involve aligning the accounting and information systems of the acquired company and this requires more non–audit services (Firth, 2002). Thus, the entity may appoint the incumbent audit firm and pay more APNAS fees when engaging in mergers and/or acquisitions (Firth, 2002). Prior studies report a significant positive association between MERACQS and APNAS fees (e.g., Firth, 1997b; Abbott *et al.,* 2003; Raghunandan *et al.,* 2003; Ghosh *et al.,* 2005; Hoitash *et al.,* 2005; Choi *et al.,* 2006). MERACQS is a dummy variable taking the value 1 if the firm was engaged in a merger/acquisition activity during the year, 0 otherwise. A positive association between APNAS fees and MERACQS is expected in this study.

Return on assets **(ROA)**

The profitability of a client is considered to be a measure of risk that may affect APNAS fees (Simunic, 1980). Hay *et al.* (2005) argues that the worse the performance of a client, the more the risk to the auditor and the higher the APNAS fees. Ashbaugh *et al.* (2003), Hoitash *et al.* (2005) and Ye *et al.* (2006) report a significant negative

[28] Mergers and acquisition data was collected from the *SDC* Platinum database.

association between ROA and APNAS fee. ROA is calculated as the current year's operating income divided by average total assets (Total $Assets_t$ + Total $Assets_{t-1}$)/2. A negative association between ROA and APNAS fees is expected in this study.

Debt to total assets **(LEVERAGE)**

The financial risk of a company is measured by the ratio of total liabilities to total assets (LEVERAGE). High debt ratios increase agency costs and companies with greater agency costs are more likely to curtail APNAS purchases (Parkash and Venable, 1993; Firth, 1997b; Abbott *et al.,* 2003; Raghunandan *et al.*, 2003). Firth (1997b) reports a significant negative association between LEVERAGE and APNAS fees. However, Ashbaugh *et al.* (2003) and Ruddock and Taylor (2005) report a significant positive association between LEVERAGE and APNAS fees. Therefore, the expected sign of LEVERAGE with APNAS fees is not specified in this study.

Negative return on assets **(NEG_ROA)**

Prior studies argue that a poorly performing company demands more APNAS to improve profitability (e.g., Firth, 1997b; Abbott *et al.,* 2003). Ashbaugh *et al.* (2003) reports a significant negative association between a negative return on assets and APNAS fees. A negative association between APNAS fees and NEG_ROA is expected in this study. NEG_ROA is an indicator variable equals to 1 if the firm reports a negative return on assets in the current year, 0 otherwise.

Market–to– book value **(MB)**

Prior studies use market–to–book ratio (MB) as a proxy for firm performance in the APNAS fees model (e.g., Ashbaugh *et al.*, 2003; Raghunandan *et al.,* 2003; Whisenant *et al.,* 2003). Ashbaugh *et al.* (2003) and Whisenant *et al.* (2003) report a significant negative association between MB and APNAS fees while Raghunandan *et*

al. (2003) finds no significant association between MB and APNAS fees. Similar to Ashbaugh *et al.* (2003) and Whisenant *et al.* (2003), a negative association between MB and APNAS fees is expected in this study.

Audit engagement **(INITIAL)**

A company may be less likely to purchase APNAS from the incumbent auditor during the early years of an audit engagement, or auditors may be more likely to market more APNAS after becoming more familiar with the client (Raghunandan *et al.,* 2003). Raghunandan *et al.* (2003) reports a significant negative association between APNAS fees and the early years of an audit engagement. Thus, a negative association between APNAS fees and INITIAL is expected in this study. INITIAL is an indicator variable equal to 1 if the audit engagement is in either its first or second year, 0 otherwise.

Board independence **(BDINDP)**

Independent directors monitor managers and hence managers are less likely to opportunistically influence auditors when the percentage of outside directors is high (Hermalin and Weisbach, 2003, Ghosh *et al.,* 2006). Ghosh *et al.* (2006) finds a significant negative association between board independence and APNAS fees. A negative association between BDINDP and APNAS fees is expected in this study.

Audit committee size **(ACSIZE)**

Size of the audit committee may affect APNAS fees. Abbott *et al.* (2003) reports that audit committees attempt to reduce the level of APNAS purchased by the auditor. Ghosh *et al.* (2006) finds that firms with larger audit committees purchase less APNAS. A negative association between ACSIZE and APNAS fees is expected in this study.

Audit committee independence (**INDEPAC**)

Auditor independence increases with the percentage of independent directors on audit committees (Carcello and Neal, 2000). Abbott *et al.* (2003) argues that audit committee members who are independent and active financial monitors have incentives to limit APNAS fees and reports a significant and negative association with the ratio of APNAS fees. Lee and Mande (2005) reports that effective audit committees seek to increase audit quality by reducing the non-audit services provided by the external auditor. Ghosh *et al.* (2006) finds a significant negative association between audit committee independence and APNAS. A negative association between INDEPAC and APNAS fees is expected in this study.

Year as dummies (**$YEAR_{03\text{-}05}$**)

$YEAR_{03\text{-}05}$ represents dummy variables for each of the years 2003–2004 (with 2005 the comparison year) of this study. It is designated as 1 if the observation is drawn from the year indicated and otherwise as 0. These variables are included to check for time–specific factors occurring across the sample period. There are two dummy variables for the three years.

Type of industry (**$\sum$INDUSTRY**)

Companies in some industries may need more consulting advice. For example, the mining industry may require more consulting services due to the greater uncertainty surrounding the eventual realisation of capitalised assets such as exploration and development costs. Ashbaugh *et al.* (2003) and Ruddock and Taylor (2005) use industry dummies to control for cross industry differences in APNAS fees. $\sum$INDUSTRY is used as a dummy variable taking the value 1 if the company belongs to the appropriate

industry group, 0 otherwise. The 26 ASX industry classifications[29] are used in this study and hence there are 25 dummy variables to account for the industries.

3.1.3.2 AUDIT FIRM TENURE

Audit firm tenure is used in this study as one of the dependent variables to measure auditor independence. AFTENURE is a continuous variable representing the number of years of the length of the relationship between the audit firm and the client. To examine the relation between audit firm tenure and interlocking variables, a modified version of the AFTENURE model used by Courtney and Jubb (2005) is employed, but some additional variables are included (e.g., unexpected audit fee, unexpected APNAS fee) that may affect audit firm tenure. The following AFTENURE model is estimated to examine the relation between interlockings and audit firm tenure:

$$\begin{aligned} AFTENURE = {} & \alpha_0 + \beta_1 INTERLOCKINGS + \beta_2 UXAF + \beta_3 LEVERAGE + \beta_4 PQUAL \\ & + \beta_5 LnTA + \beta_6 BIG4 + \beta_7 LnAGE + \beta_8 G\_TA + \beta_9 LOSS + \\ & \beta_{10} UXAPNAS + \beta_{11} AA + \beta_{12} BDINDP + \beta_{13} ACSIZE + \beta_{14} INDEPAC \\ & + \beta_{15} YEAR_{03\text{-}05} + \varepsilon \qquad (2) \end{aligned}$$

Where

AFTENURE = number of years the audit firm has been engaged by the current client;

Test Variables

INTERLOCKINGS = as stated earlier;

Control variables

UXAF = unexpected audit fees estimated from the residuals of the audit fee model, excluding the interlocking variables;

[29] For industry classification, this study uses Global Industry Classification Standards (GICS) 4-digit for all industry sectors other than Materials, where a 6-digit code is used. Energy (1010) industry is the base for dummy variable.

LEVERAGE	=	ratio of total liabilities to total assets;
PQUAL	=	1 if the company has other than an unqualified opinion in the previous year, 0 otherwise;
LnTA	=	natural log of total assets;
BIG 4	=	1 if company's incumbent auditor is a BIG 4 audit firm, 0 otherwise;
LnAGE	=	natural log of age of the company measured as the number of years the company has been listed on the ASX;
G_TA	=	Growth–measured as the percentage change in total assets from the previous period[30];
LOSS	=	1 if the company reported a loss either in the current or previous year, 0 otherwise;
UXAPNAS	=	unexpected APNAS fees estimated from the residuals of the APNAS fee model, excluding the interlocking variables;
AA	=	1 if the audit firm was Arthur Andersen during 2001, 0 otherwise;
BDINDP	=	1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
ACSIZE	=	number of audit committee members;
INDEPAC	=	1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
$YEAR_{03-05}$	=	dummy variables for year of data.

[30] Growth can be measured by sales growth, asset growth or the ratio of market to book value (MB). This model uses asset growth so all types of companies can be included in the sample. Studies that use sales growth have had to exclude financial entities due to their specific nature. The AFTENURE model (Equation 2) was re-run substituting G_TA to sales growth. The results were the same.

3.1.3.2.1 Control variables

The following sections discuss the control variables for the AFTENURE model.

Unexpected audit fees **(UXAF)**

Audit firm tenure may be influenced by unexpected audit fees (UXAF) earned by the audit firm for auditing the client's financial statements. Haskins and Williams (1990) argues that audit fees that are perceived to be excessively high are influential for auditor changes. Courtney and Jubb (2005) reports a significant positive association between audit firm tenure and audit fees. If an auditor earns more than the expected fees from a client it may motivate the auditor to continue the engagement with the auditee for a longer period. Alternatively, it may also motivate the client to change auditors to a lower fee auditor. No direction of association between UXAF and AFTENURE is predicted in this study. UXAF is measured as the residuals from the estimated audit fees model.[31]

Debt to total assets **(LEVERAGE)**

The total liabilities to total assets ratio (LEVERAGE) reflects the leverage of the company and is an indicator of the long–term solvency and financial risk position of the company (Monroe and Teh, 1993; Jubb, 2000). A relatively risky client (high LEVERAGE) may have shorter auditor tenure than a less risky client (Sinason *et al.*, 2001). Financially stressed clients are more likely to replace their audit firms than healthier companies (Schwartz and Menon, 1985; Hudaib and Cooke, 2005; Nasser *et*

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[31] This study estimates the following model for calculating UXAF. The natural log of audit fees (LnAF) as the dependent variable (same as Eq. 1 excluding INTERLOCKING variable):
$LnAF = \beta_0 + \beta_1 LnTA + \beta_2 BIG4 + \beta_3 EQUITY + \beta_4 MERACQS + \beta_5 ROA + \beta_6 LEVERAGE + \beta_7 NEG\_ROA + \beta_8 MB + \beta_9 INITIAL + \beta_{10} BDINDP + \beta_{11} ACSIZE + \beta_{12} INDEPAC + \beta_{13} YEAR_{03-05} + \beta_{14} \Sigma INDUSTRY + \varepsilon$

UXAF is the residual from the above model. Unexpected fees can also be calculated by taking the difference between estimated fees and actual fees for each observation. Results were robust in both cases.

al., 2006). Nasser *et al.* (2006) reports that a client's financial risk is significantly associated with auditor switching. Courtney and Jubb (2005) argues that high LEVERAGE acts as a disincentive to auditors to continue the auditor–client relationship. However, their study does not find any significant association between financial risk and audit firm tenure. A negative association between LEVERAGE and AFTENURE is expected.

Previous year audit opinion **(PQUAL)**

Auditors may lose an audit engagement by qualifying the audit report. Prior studies argue that receiving an opinion other than unqualified in the previous year may induce the client to find a new auditor or to have a higher tendency to switch auditors (e.g., Chow and Rice, 1982; Schwartz and Menon, 1985; Krishnan, 1994; Sinason *et al.,* 2001). However, prior studies report that firms that received qualified audit opinions are not more likely to switch audit firms (e.g., Chow and Rice, 1982; Schwartz and Menon, 1985; Courtney and Jubb, 2005). A dichotomous variable is used, coded 1 if the audit report of a company is other than unqualified in the prior year, 0 otherwise. A negative association between PQUAL and AFTENURE is expected.

Total assets **(LnTA)**

Audits of large companies may incur greater start–up costs for both the auditor and the client, which may discourage large companies from switching auditors. The increased costs may cause enhanced nurturing of the auditor–client relationship, which increases auditor tenure (Sinason *et al.*, 2001). Larger companies generally hire BIG 4 auditors that provide high quality audits, which also decrease the likelihood of auditor switching (DeAngelo, 1981a). Courtney and Jubb (2005) does not find a significant association between auditor tenure and size of the company. Nasser *et al.* (2006) finds a

significant positive association between company size and auditor tenure. The size of the company is measured by using the natural log of total assets (LnTA). A positive association between LnTA and AFTENURE is expected.

Big 4 **(BIG 4)**

The size of the audit firm may affect the duration of the auditor–client relationship (Courtney and Jubb, 2005). Larger clients may require larger audit firms due to their audit resource requirements and these auditor and client relationships may be longer than those of non–BIG 4 audit firms (Sinason *et al.*, 2001). Levinthal and Fichman (1988) reports that client relations with BIG 8 firms are likely to last longer than those with non–BIG 8 auditors. Courtney and Jubb (2005) also reports a positive association between BIG 6 auditors and audit firm tenure. Nasser *et al.* (2006) reports a significant negative association between BIG 4 audit firms and audit firms' switching. BIG 4 is captured by a dichotomous variable taking the value 1 if a company's auditor is a member of the BIG 4 audit firms, 0 otherwise. A positive association with AFTENURE is expected in this study.

Company age **(LnAGE)**

Audit firm tenure may depend on the age of the company (Courtney and Jubb, 2005). Relatively younger companies are more likely to experience financial distress and may receive a qualified audit report and consequently there is a higher probability of auditor switching (Chow and Rice, 1982; Dopuch *et al.*, 1987; Monroe and Teh, 1993; Jubb, 2000). Courtney and Jubb (2005) reports a significant positive association between company age and auditor tenure. Their study argues that the older companies have had the time to build a personal attachment with the auditors compared to newer or younger companies that have had less time to have had an auditor. A positive

association between company age and AFTENURE is expected. LnAGE is measured as the natural log of the number of years the company has been listed on the ASX.

Growth **(G_TA)**

A client's growth may affect audit firm tenure. Growth of the company may influence the decision to change auditors because the current auditor may not have enough resources to provide auditing services for the new resource requirements of a client that is experiencing significant growth (Seabright *et al.*, 1992; Courtney and Jubb, 2005). Haskins and Williams (1990) reports that the growth of a client is a significant determinant of auditor change. Courtney and Jubb (2005) reports a significant negative association between growth and audit firm tenure. G_TA is operationalised as the percentage change in total assets from the prior year. A negative association between G_TA and AFTENURE is expected.

Current or previous year loss **(LOSS)**

LOSS is an indicator variable equal to 1 if the company reports a loss for either the current or previous year, 0 otherwise. Companies that incur losses are more likely to receive a qualified audit opinion due to a higher litigation risk (Lai and Yim, 2003). A company receiving a qualified audit opinion may be motivated to switch auditors in order to gain a clean report from the new auditor (Teoh, 1992; Lai and Yim, 2003). In addition, companies that incur losses are more likely to be associated with damages to the reputation of auditors in the event of litigation, and auditors may be less likely to retain such clients (Menon and Williams 1994; DeFond *et al.,* 1997; Krishnan and Krishnan, 1997). A negative association between LOSS and AFTENURE is expected.

Auditor provided unexpected non–audit services **(UXAPNAS)** *fees*

Auditor reliance on auditor provided non–audit fees may affect auditor tenure. Auditors earning unexpectedly high APNAS fees may be motivated to continue the audit engagement for a longer period and earn future positive unexpectedly high APNAS fees. UXAPNAS is measured as the residuals from the estimated APNAS fee model (Eq. 1). A positive association between UXAPNAS fees and AFTENURE is expected.

Arthur Andersen **(AA)**

Arthur Andersen (AA) was dissolved in 2001 and all of its clients had to change auditor. This affects audit firm tenure during the period of study. In order to control for the impact of this issue on audit firm tenure, a dummy variable taking the value 1 if the audit firm was AA during 2001, 0 otherwise is used. A negative association between AA and AFTENURE is expected.

Board independence **(BDINDP)**

Independent directors are more likely to draw on their broader experience and expertise in management oversight and to perform better as board members (Kosnik 1987). Beasley and Petroni (2001) finds that boards with a higher percentage of outside directors are more likely to select a specialist Big 6 auditor, hence there is less likelihood of switching auditor. Chen and Zhou (2007) finds that clients with more independent boards were more likely to dismiss Andersen earlier due to their concern for auditor independence. A negative association between BDINDP and AFTENURE is expected.

Audit committee size (**ACSIZE**)

Prior research (e.g., Pincus *et al.,* 1989) suggests that audit committee size influences their effectiveness. Lennox and Park (2007) claims that the audit committee is the most important governance mechanism with respect to audit firm appointments because the audit committee is responsible for hiring the external auditor and overseeing audit quality. Chen and Zhou (2007) argues that larger audit committees with increased organizational status and power delegated by boards of directors are thus more likely to be recognized as an authoritative body by management, external auditors, and internal auditors. Larger audit committees are also more likely to care about auditor reputation and were more likely to dismiss Andersen earlier (Chen and Zhou, 2007). A negative association between ACSIZE and AFTENURE is expected.

Audit committee independence (**INDEPAC**)

An active audit committee composed entirely of outside directors is a key element of effective corporate governance (Jemison and Oakley, 1983; Chen and Zhou, 2007). Carcello and Neal (2003) observes that greater audit committee independence and expertise can help reduce the likelihood of auditor dismissal after the issuance of new going-concern reports. Using a sample of 821 firms, which dismissed Arthur Andersen as their auditor between October 15, 2001 and August 31, 2002, Chen and Zhou (2007) finds that firms with more independent audit committees dismissed Andersen earlier. Hoitash and Hoitash (2008) investigates whether audit committee expertise, size and diligence are associated with auditor dismissal and reports that stronger audit committees are less likely to dismiss their auditors. A negative association between INDEPAC and AFTENURE is expected.

Year as dummies (**YEAR**$_{03\text{-}05}$)

Definitions and reasons for use are the same as previously described.

3.1.3.3 AUDIT OPINION

This section describes the model used to examine the association between interlockings and audit quality where audit quality is proxied by the likelihood of issuing a qualified audit opinion by the auditor. OPINION is the dependent variable to investigate whether the interlockings are associated with the likelihood of issuing a qualified audit opinion by the auditor after controlling for factors that are likely to affect audit opinion. OPINION is a dummy variable set to 0 if the company has an unqualified opinion in the current year and set to 1 for other than an unqualified opinion.

Prior studies develop models for predicting audit opinions. The current study uses the independent variables used by Monroe and Teh (1993, 2000) and includes other variables considered appropriate for predicting the likelihood of issuing a qualified audit opinion. The following logistic regression model is estimated to investigate the associations between interlockings and OPINION:

$$\begin{aligned} \text{OPINION} = {} & \alpha_0 + \beta_1\text{INTERLOCKINGS} + \beta_2\text{BIG4} + \beta_3\text{LnTA} + \beta_4\text{UXAF} + \\ & \beta_5\text{LEVERAGE} + \beta_6\text{PQUAL} + \beta_7\text{LnAGE} + \beta_8\text{UXAPNAS} + \\ & \beta_9\text{AFTENURE} + \beta_{10}\text{LOSS} + \beta_{11}\text{INITIAL} + \beta_{12}\text{ROA} + \beta_{13}\text{SQRSUBS} + \\ & \beta_{14}\text{INDEPAC} + \beta_{15}\text{BDINDP} + \beta_{16}\text{ACSIZE} + \beta_{17}\text{YEAR}_{03\text{-}05} + \varepsilon \end{aligned} \quad (3)$$

Where

OPINION = 1 if the auditor issues other than an unqualified opinion in the current year, 0 otherwise;

Test Variables

INTERLOCKINGS = as stated earlier;

Control variables

BIG 4 = 1 if company's incumbent auditor is a BIG 4 audit firm, 0 otherwise;

PQUAL = 1 if the company has other than an unqualified opinion in the previous year, 0 otherwise;

LnTA = natural log of total assets;

UXAF = unexpected audit fees estimated from the residuals of the audit fee model;

LEVERAGE = ratio of total liabilities to total assets;

LnAGE = natural log of age of the company measured as the number of years the company has been listed on the ASX;

UXAPNAS = auditor provided unexpected non–audit fees estimated from the residuals of the APNAS fee model;

AFTENURE = number of years that the audit firm has been engaged with the current auditee;

LOSS = 1 if the company reported a loss either in the current year or previous year, 0 otherwise;

INITIAL = 1 if the audit firm engagement is in either the first or second year with the current auditee, 0 otherwise;

ROA = operating income divided by average total assets;

SQRSUBS = square root of number of subsidiaries;

INDEPAC = 1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;

BDINDP = 1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;

ACSIZE = number of audit committee members;

$YEAR_{03-05}$ = dummy variables for year of data.

3.1.3.3.1 Control variables

The following sections discuss the control variables of the OPINION model.

Big 4 **(BIG 4)**

Auditor quality is frequently measured by audit firm size. Smaller audit firms may not have effective audit technology compared to BIG 4 audit firms to detect situations requiring an audit qualification (Monroe and Teh, 1993). Smaller audit firms could also be less willing to issue qualified audit opinions due to their smaller client base and the possibility of auditor switching (Monroe and Teh, 1993). Kida (1980) finds that an auditor's opinion decision could be influenced by the perceived consequences of qualifying or not qualifying the opinion. Jubb (2000) finds that the presence of a BIG 6 auditor is negatively associated with the likelihood of receiving an audit qualification. Mutchler (1984) reports that smaller auditing firms tended not to qualify smaller companies given similar or worse levels of financial distress as those experienced by larger companies and audit firms. Monroe and Teh (2000) and Jackson *et al.* (2008) find a significant negative association between BIG 6 and the likelihood of receiving a qualified audit opinion. Larger clients may also choose BIG 4 audit firms and are generally in a sound financial position with less need to issue a qualified opinion. BIG 4 is captured by a dichotomous variable taking the value 1 if a company's auditor is a member of the BIG 4 audit firm, 0 otherwise. Similar to other studies (e.g., Jubb, 2000;

Monroe and Teh, 2000; Jackson *et al.,* 2008), a negative association between BIG 4 and the likelihood of receiving a qualified audit opinion is expected.

Total assets **(LnTA)**

The natural log of total assets (LnTA) is used to control for the effect of company size on the audit opinion. A larger entity can represent a healthy, growing and prosperous company and it is less likely that any uncertainties will be material enough to issue a qualified opinion compared to a smaller entity (Monroe and Teh, 1993; Jubb, 2000). Smaller companies receive qualified opinions more often than large companies (Monroe and Teh, 1993; Krishnan, 1994; Carcello *et al.,* 1995, Lennox, 2002; Li *et al.,* 2003; Jackson *et al.,* 2008; Lai and Gul, 2008). A negative association between LnTA and the likelihood of receiving a qualified audit opinion is expected.

Unexpected audit fees **(UXAF)**

An audit firm's dependence on a particular client or group of clients for audit fees may provide incentives not to qualify the audit report when it should be qualified. When audit firms earn high fees, they may face economic pressure to give clean opinions in order to deter clients from switching to other auditors (Lennox, 2003). Hoitash *et al.* (2005) reports that clients with higher than normal fees were more likely to exercise influence on their auditors. Geiger and Rama (2003) finds a significant positive association between the magnitude of audit fees and the likelihood of receiving a going–concern qualified audit opinion. A negative association between UXAF and the likelihood of receiving a qualified audit opinion is expected. UXAF is the residual from the estimated audit fee model.

Debt to total assets **(LEVERAGE)**

The total liabilities to total assets ratio (LEVERAGE) is used as an indicator of the long–term solvency and financial risk position of the company (Monroe and Teh, 1993; Jubb, 2000). Mutchler (1984) and Levitan and Knoblett (1985) find that financial leverage is an important consideration for auditors in assessing a company's going–concern ability. Li *et al.* (2003) and Ye *et al.* (2006) find that leverage is significant and positively related to the type of audit opinion, suggesting that companies with higher leverage are more likely to receive a qualified or modified audit opinion. Monroe and Teh (1993) and Jubb (2000) report a significant positive association between LEVERAGE and OPINION. A positive association between LEVERAGE and the likelihood of receiving a qualified audit opinion is expected.

Previous year audit opinion **(PQUAL)**

The current year's audit opinion might be influenced by the prior year's audit opinion (Mutchler, 1985; Monroe and Teh, 1993). A company receiving an uncertainty qualification in the previous year is likely to receive a qualification for the same reason in the current year as the uncertainties could extend beyond one year (Monroe and Teh, 1993). Several studies find that auditors are more likely to issue going–concern opinions in the presence of previous going-concern problems (e.g., Mutchler, 1985; Lennox, 2003). Prior studies report a significant positive association between PQUAL and less likely to issue a going–concern opinion (Jubb, 2000; Monroe and Teh, 2000; Jackson *et al,* 2008; Lai and Gul, 2008). A dichotomous variable is used, coded 1 if the audit report of a company was other than unqualified in the prior year, 0 otherwise. A positive association between PQUAL and the likelihood of receiving a qualified audit opinion is expected.

Company age **(LnAGE)**

Younger companies are more likely to experience financial distress and, consequently, they are more likely to receive an audit qualification (Dopuch *et al.*, 1987; Monroe and Teh, 1993; Jubb, 2000). Lincoln *et al.* (1992) argues that older companies enjoy reputation and status because of their longevity and are less likely to receive a qualification. Firth (2002) argues that as older companies are better known by investors, they are less likely to be involved in litigation with investors and, therefore, have a lower probability of receiving qualified opinions. LnAGE is the natural log of the number of years the company has been listed on the ASX. A negative association between LnAGE and the likelihood of receiving a qualified audit opinion is expected.

Auditor provided unexpected non–audit **(UXAPNAS)** *fees*

UXAPNAS fees from a client may influence the auditor's judgment about what type of audit opinion to issue. When auditors earn a significant amount of positive UXAPNAS fees from an individual client or a group of clients it may make auditors more economically dependent on those clients and, as a result, auditors may not qualify audit reports for those clients (Magee and Tseng, 1990; Becker *et al.,* 1998). If UXAPNAS fees influence auditor judgment, then the incidence of qualified audit reports may decline (Firth, 2002). UXAPNAS fee is the residual from the estimated APNAS fees model (Eq. 1). A positive association between UXAPNAS and the likelihood of receiving a qualified audit opinion is expected.

Audit firm tenure **(AFTENURE)**

The type of audit opinion received may influence a client's decision to switch or retain the incumbent auditor (Ruiz–Barbadillo *et al.,* 2006). The probability of retaining the incumbent auditor will be higher when a company receives a clean audit opinion

(Ruiz–Barbadillo *et al.,* 2006). If there is a disagreement between the client and the auditor and the auditor has issued a qualified audit opinion, then the client may switch auditors (Krishnan, 1994; Krishnan and Stephens 1995; Lennox, 2000). Prior studies provide evidence that extended audit firm tenure does not reduce the likelihood of issuing a qualified audit report (Barkess and Simnett, 1994; Geiger and Raghunandan, 2002; Carcello and Nagy, 2004; Jackson *et al.,* 2008). Alternatively, when auditors have long–term relationships with their clients, expected future rents may be higher and the auditor may not qualify the audit opinion (Lennox, 2003). AFTENURE is a continuous measure of the number of years the current auditor has been audited the client. Direction between AFTENURE and the likelihood of receiving a qualified audit opinion is not predicted in this study due to the conflicting arguments mounted in previous studies.

Current or previous year loss (**LOSS**)

LOSS is an indicator variable equal to 1 if the company reports a loss in either the current or previous year, 0 otherwise. LOSS increases the likelihood of a qualified opinion because of the higher litigation risk, and profitable firms are less likely to receive a qualified opinion because of the lower likelihood of a lawsuit against the auditor (Lai and Yim, 2003) and also more likely to have going–concern issues. Shareholders are more likely to sue the auditors of clients that have poor profitability and auditors may defend themselves by qualifying the audit report (Firth, 2002). Monroe and Teh (1993), Ye *et al.* (2006) and Lai and Gul (2008) find a significant positive association between recurring losses and the likelihood of receiving a qualified audit opinion. DeFond *et al.* (2002) finds a positive and significant relation between a qualified audit opinion and incurring a loss in the prior year. A positive association between LOSS and the likelihood of receiving a qualified audit opinion is expected.

Audit engagement **(INITIAL)**

New auditors are less likely to issue a qualified audit opinion (Ruiz–Barbadillo *et al.,* 2006). Both the auditor and auditee accrue some initial costs in an audit engagement (Johnson, 2006). Auditors who do not want to lose the client in the initial year and want to recover their initial costs in subsequent years may not issue a qualified audit opinion because it is assumed that receiving an opinion other than unqualified may motivate the client to find a new auditor (Chow and Rice, 1982; Krishnan, 1994; Sinason *et al.,* 2001). Alternatively, DeAngelo (1981b) suggests that the auditor's initial start–up costs become sunk costs in subsequent audits and do not affect the auditor's reporting decision. A longer tenure may mean audit firms better understand clients' financial conditions and are more likely to detect going–concern difficulties (Lennox, 2003). INITIAL is an indicator variable equal to 1 if the audit engagement is in either the first or second year, 0 otherwise. Direction of association between INITIAL and the likelihood of receiving a qualified audit opinion is not predicted.

Return on assets **(ROA)**

Return on assets (ROA) is used to measure the profitability of the client. An auditor may consider this ratio for issuing a going–concern qualified audit decision because poor profitability may increase the inherent risk of the audit (Monroe and Teh, 2000). Poor operating results are likely to place pressure on management and they may mis–state the financial statements to show a more favourable financial position by enhancing the results of the operations (Monroe and Teh, 2000). This pressure increases the likelihood that the auditor will issue a qualified audit opinion (Monroe and Teh, 2000). ROA is measured from current year operating profit divided by average total assets (Total $Assets_1$ + Total $Assets_{t-1}$)/2. A negative association between ROA and the likelihood of receiving a qualified audit opinion is expected.

Number of subsidiaries (**SQRSUBS**)

The number of subsidiaries of a company is used as a proxy for the complexity of the client's organisation (Monroe and Teh, 2000). An auditor considers the complexity of the entity when assessing inherent risk and issuing audit opinion (Monroe and Teh, 2000).[32] An auditor may qualify the audit report to avoid future litigation for a risky client (Monroe and Teh, 2000). Monroe and Teh (2000) argues that a complex organisational structure may signal manipulated financial information or complex transactions, which increases audit risk and this increases the likelihood that the auditor will issue a qualified audit opinion. Monroe and Teh (2000) does not find a significant association between the number of subsidiaries and audit opinion. The square root of the number of subsidiaries (SQRSUBS) is used as a measure for audit complexity. A positive association between SQRSUBS and the likelihood of receiving a qualified audit opinion is expected.

Audit committee independence (**INDEPAC**)

Prior research suggests that independent audit committees improve the quality of external financial reporting and facilitate the audit process (Monroe and Teh, 2000). Monroe *et al.* (1995) finds a significant positive association between the independence of audit committees and qualified audit opinions. However, Monroe and Teh (2000) finds no significant association between them. Carcello and Neal (2000) finds that the higher the percentage of affiliated directors on the audit committee, the lower the probability the auditor would issue a going–concern audit qualification. INDEPAC is proxied by a dummy variable of 1 if the majority (fifty per cent or more) of the audit committee members are non–executive directors, 0 otherwise. Direction of association

[32] Most of the prior studies use receivable plus inventory to total assets as proxy for audit complexity. Monroe and Teh (2000) uses the number of subsidiaries as a measure of complexity for predicting audit opinion. The current study uses the number of subsidiaries to include all types of companies (financial companies do not have receivables and inventory). The model (Equation 3) was re-run replacing receivable plus inventory to total assets, however, the results remained the same.

between INDEPAC and the likelihood of receiving a qualified audit opinion is not predicted.

Board independence (**BDINDP**)

Prior research (e.g. Beasley, 1996; Klein, 2002; Xie *et al.*, 2003) has shown that board characteristics have an important impact on the quality of financial reporting. Beasley (1996) predicts that the inclusion of larger proportion of outside directors on the board significantly reduces the likelihood of financial statement fraud and finds that no-fraud firms have boards with significantly higher percentage of outside members than fraud firms. Farinha and Viana (2009) reports that firms with more diligent and independent boards are less likely to receive a modified audit opinion. A negative association between BDINDP and OPINION is expected.

Audit committee size (**ACSIZE**)

Audit committee size may affect audit quality. Beasley (1996) finds that smaller audit committees may be more effective than larger committees. Carcello and Neal (2000) argues that if smaller committees are more effective, audit committee size might be associated with a higher incidence of going-concern reports for financially distressed companies. Their study does not find noticeable differences in audit committee size between companies receiving going-concern or unmodified reports. A positive association between ACSIZE and OPINION is expected.

Year as dummies (**YEAR**$_{03\text{-}05}$)

Two dummy variables are used (representing 2003 and 2004) for the three years of data in the OPINION model to check for time–specific factors occurring across the sample period. The definition is the same as previously described in this thesis.

3.1.3.4 EARNINGS MANAGEMENT

This section describes the model for calculating discretionary accruals, which are used to investigate whether interlockings are associated with earnings management. Hoitash *et al.* (2005) argues that discretionary accruals provide a metric for assessing the degree of bias infused into the financial statements by management and tolerated by the auditor. If interlockings are related to higher discretionary accruals, this would provide evidence that interlocking companies manipulate financial reports through earnings management to a greater extent than do non–interlocking companies.

Following the studies of Hribar and Collins (2002) and Coulton *et al.* (2005), the total accruals (TACC) component of earnings is measured as the difference between operating income/profit (OI) and cash flow from operations (CFO). Hribar and Collins (2002) argues that this direct measure of accruals was less subjective to measurement error. The following equation is used to calculate total accruals:

$$TACC = OI - CFO \qquad (4)$$

Where

TACC = total accruals;

OI = operating income;

CFO = cash flow from operations.

Estimates of discretionary accruals are often criticised due to the lack of power of the models in detecting earnings management.[33] The current study uses the cross–

[33] There are a few studies that examine the prediction capability of accruals models. Dechow *et al.* (1995) evaluates the relative performance of five earnings management models in detecting earnings management by comparing the specification and power of commonly used tests across discretionary accruals generated by the models. Their study shows that the Modified Jones Model provides the most powerful test of earnings management. Bartov *et al.* (2001) investigates the ability to detect earnings management for six discretionary accruals models and the contingency-table tests for the association between high discretionary accruals and audit qualifications shows significant results for the Modified Jones Models, and the two cross-sectional models.

sectional forward–looking Modified–Jones model of Dechow *et al.* (2003) to estimate the magnitude of discretionary accruals. An Australian study by Coulton *et al.* (2005) compares three Modified–Jones models and suggests that:

> "researchers attempting to identify expected accruals using Australian data should consider extending the Modified–Jones model in the manner suggests by Dechow *et al.* (2003)" (p. 562).

Dechow *et al.* (2003) includes sales growth (S_GROWTH) in the cross–sectional modified forward–looking Jones model, which doubled the explanatory power of the Modified–Jones model. Their study includes the lagged value of total accruals (LTACC) to capture the extent to which a current year's accruals are a function of the previous year's accruals. Coulton *et al.* (2005) argues that accruals are less persistent than cash flow as a result of the way they reverse, so the inclusion of lagged total accruals should help capture the predictable component. The current study includes both S_GROWTH and LTACC in estimating discretionary accruals. Subject to a minimum of 10 observations in each industry category for each year, this model is estimated cross–sectionally for each 4–digit Global Industry Classification Standard (GICS) (6–digit for the Materials sector) industry group in each of the years 2003–2005 as follows:

$$TACC = \alpha + \beta_1(\Delta REV - \Delta REC) + \beta_2 PPE + \beta_3 LTACC + \beta_4 S\_GROWTH + \varepsilon \quad (5)$$

Where

TACC = total accruals are the difference between operating income (OI) and cash flow from operations (CFO);

ΔREV = change in revenue from period t-1 to period t;

ΔREC = change in net accounts receivables from period t-1 to period t;

PPE = gross value of property, plant and equipment;

LTACC = value of total accruals in year t-1, that is the difference between the operating income (OI) and cash flow from operation (CFO) in previous year scaled by average of total assets of t-1 and t-2;

S_GROWTH = next year sales minus current year sales divided by current year sales;

ε = error terms.

Following Dechow *et al.* (2003), all variables, other than S_GROWTH, are scaled by the average value of total assets.

This section describes the discretionary accruals model used in recent studies (e.g., Ashbaugh *et al.,* 2003; Ruddock *et al.,* 2004; Ruddock and Taylor, 2005). The model is used to investigate whether interlockings are associated with the absolute value of discretionary accruals. The absolute value of discretionary accruals ABSDACC is the dependent variable for testing the hypotheses. Discretionary accruals are the residuals estimated from the above model (equation 5).

$$DACC = \alpha_1 + \beta_1 INTERLOCKINGS + \beta_2 UXAF + \beta_3 UXAPNAS + \beta_4 AFTENURE + \beta_5 BIG4 + \beta_6 CASHFLOW + \beta_7 LTACC + \beta_8 LnMVE + \beta_9 LEVERAGE + \beta_{10} MB + \beta_{11} LOSS + \beta_{12} MERACQS + \beta_{13} EQUITY + \beta_{14} BDINDP + \beta_{15} ACSIZE + \beta_{16} INDEPAC + \beta_{17} YEAR_{03\text{-}05} + \varepsilon \quad (6)$$

Where

DACC = discretionary accruals calculated as the residuals from the TACC model (equation 5).

Test Variables

INTERLOCKINGS = as stated earlier;

Control variables

UXAF	=	unexpected audit fees estimated from the residuals of the audit fee model, excluding interlocking variables;
UXAPNAS	=	auditor provided unexpected non–audit fees estimated from the residuals of the APNAS fee model, excluding interlocking variables;
AFTENURE	=	number of years that the audit firm has been engaged with the current auditee;
BIG 4	=	1 if company's incumbent auditor is a BIG 4 audit firm, 0 otherwise;
CASHFLOW	=	cash flow from operations scaled by current year's total assets;
LTACC	=	value of total accruals in year t-1 scaled by average total assets;
LnMVE	=	natural log of market value of equity, a company's market value of equity is calculated as its price per share at fiscal year end times the number of shares outstanding;
LEVERAGE	=	ratio of total liabilities to total assets;
MB	=	market–to–book ratio at fiscal–year–end, defined as market value of equity divided by shareholders equity;
LOSS	=	1 if the company reported a loss either in the current year or previous year, 0 otherwise;
MERACQS	=	1 if the company is engaged in a merger/acquisition activity in the current year, 0 otherwise;
EQUITY	=	1 if the company issues new shares during the current year, 0 otherwise;

BDINDP	=	1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
ACSIZE	=	number of audit committee members;
INDEPAC	=	1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise;
$YEAR_{03\text{-}05}$	=	dummy variables for year of data.

3.1.3.4.1 Control variables

The following sections discuss the control variables for the DACC model.

Unexpected audit fees **(UXAF)**

UXAF are the residuals from the estimated audit fees model. Hoitash *et al.* (2005) argues that higher audit fee premiums (abnormal audit fees) are associated with lower audit quality. Their study finds a significant positive association between UXAF fees and the absolute value of discretionary accruals. However, Choi *et al.* (2006) finds no significant association between UXAF fees and the absolute value of discretionary accruals. The direction of association between UXAF and ABSDACC is not predicted.

Auditor provided unexpected non–audit **(UXAPNAS)** *fees*

Auditor quality may be influenced by the amount of UXAPNAS fees (Hoitash *et al.,* 2005). UXAPNAS fees are the residuals from the estimated APNAS fees model (Eq. 1). Choi *et al.* (2006) finds no significant association between UXAPNAS and the absolute value of discretionary accruals. However, Hoitash *et al.* (2005) finds a significant positive association between UXAPNAS fees and the absolute value of discretionary accruals. The direction of association between UXAPNAS and ABSDACC is not predicted.

Audit firm tenure (**AFTENURE**)

Longer audit firm tenure may allow management greater scope to participate in opportunistic earnings management activities (Rusmin *et al.*, 2005). Prior research (e.g., Chung and Kallapur, 2003; Myers *et al.*, 2003) includes AFTENURE to control for the effect of auditor tenure on earnings management. Myers *et al.* (2003) finds that both discretionary and current accruals had significant and negative relations with auditor tenure. Chung and Kallapur (2003) and Gul *et al.* (2007) find a significant and negative association between the absolute value of discretionary accruals and auditor tenure. AFTENURE is used as a continuous variable for the number of years of audit firm engagement with the current auditee. A negative association between AFTENURE and ABSDACC is expected.

Big 4 (**BIG 4**)

Auditor quality may be associated with the magnitude of earnings management (Frankel *et al.*, 2002; Gul *et al.*, 2003). Prior research suggests that BIG 4/5 auditors are less likely to allow earnings management than non–BIG 4/5 auditors (e.g., Becker *et al.*, 1998; Francis *et al.*, 1999). BIG 4/5 auditors are commonly perceived to provide a higher quality audit than their counterparts (Heninger, 2001; Mayhew and Wilkins, 2003). Ashbaugh *et al.* (2003), Ruddock and Taylor (2005), Choi *et al.* (2006) and Jackson *et al.* (2008) find a significant negative association between BIG 5 auditors and the absolute value of discretionary accruals. BIG 4 is a dummy variable taking the value 1 if the audit firm is BIG 4, 0 otherwise. A negative association between BIG 4 and ABSDACC is expected.

Cash flow from operations (**CASHFLOW**)

Companies with a high cash flow (CASHFLOW) from operations may be more likely to attain earnings benchmarks (Frankel *et al.*, 2002). Following Ashbaugh *et al.*

(2003), the current study uses CASHFLOW to control for current performance, which is the cash flow from operations scaled by current year's total assets. Prior studies report a significant negative association between CASHFLOW and the absolute value of discretionary accruals (Ashbaugh *et al.,* 2003; Ruddock and Taylor, 2005; Choi *et al.,* 2006; Gul *et al.,* 2007; Jackson *et al.,* 2008; Lai and Gul, 2008). A negative association between CASHFLOW and ABSDACC is expected.

Lagged total accruals (**LTACC**)

The lagged value of total accruals (LTACC) can capture the extent to which the current year's accruals are a function of the previous year's accruals (Ruddock and Taylor, 2005). Ashbaugh *et al.* (2003) and Ruddock and Taylor (2005) find a significant negative relation between the absolute value of discretionary accruals and LTACC. Similar to Ashbaugh *et al.* (2003) and Ruddock and Taylor (2005), operating income less operating cash flow from the previous year lagged by average $(TA_{t-1} + TA_{t-2})/2$ total assets is used and a negative association with ABSDACC is expected.

*Market value of equity (***LnMVE***)*

The size of the client company may influence the earnings management decisions of management (Jubb, 2000). Large companies are less likely to engage in earnings management because large companies are more likely to face scrutiny from financial analysts and investors (Zhou and Elder, 2001; Rusmin *et al.*, 2005). Client company size is measured as the natural log of market value of equity (LnMVE).[34] Previous studies find a significant negative association between the absolute value of discretionary accruals and LnMVE (e.g., Ashbaugh *et al.,* 2003; Hoitash *et al.*, 2005;

[34] The alternative measures of company size are total assets and revenue. This study also ran the regression using the natural log of total assets (LnTA) and natural log of revenue (LnREVENUE) separately replacing LnMVE. The results were similar.

Ruddock and Taylor, 2005; Lai and Gul, 2008). A negative association between ABSDACC and LnMVE is expected.

Debt to total assets **(LEVERAGE)**

Companies with higher levels of debt may manipulate discretionary accruals to loosen debt covenant constraints (DeFond and Jiambalvo, 1994). Prior studies show that firms with a higher likelihood of violating debt agreements are more likely to have an incentive to engage in earnings management (e.g., DeFond and Jiambalvo, 1994; Sweeney, 1994). Ruddock and Taylor (2005) finds a significant positive association between LEVERAGE and the absolute value of discretionary accruals. Frankel *et al.* (2002), Ashbaugh *et al.* (2003) and Jackson *et al.* (2008) report a significant negative association between LEVERAGE and the absolute value of discretionary accruals. Direction is not predicted due to the mixed findings between LEVERAGE and ABSDACC.

Market–to–book–value **(MB)**

Prior research uses MB as a measure of a company's growth opportunities and shows that high growth firms have a greater incentive to engage in earnings management (Skinner and Sloan, 2002; Chung and Kallapur, 2003; Rusmin *et al.*, 2005). Hoitash *et al.* (2005) and Ruddock and Taylor (2005) find that the absolute value of discretionary accruals is significant and positively associated with MB. A positive association between MB and ABSDACC is expected.

Current or previous year loss **(LOSS)**

Prior research documents that discretionary accruals are dependent on a firm's financial performance (e.g., Dechow *et al.*, 1995; Frankel *et al.*, 2002; Kothari *et al.*, 2005). This is because a firm's financial performance may affect management's

opportunistic window and the incentives for managing earnings (Rusmin *et al.*, 2005). Previous studies find a significant positive association between LOSS and the absolute value of discretionary accruals (e.g., Frankel *et al.*, 2002; Ashbaugh *et al.,* 2003; Ruddock and Taylor, 2005; Rusmin *et al.*, 2005; Gul *et al.,* 2007). LOSS is a dummy variable taking the value 1 if the company reported a loss either in the current year or previous year, 0 otherwise. A positive association between LOSS and ABSDACC is expected.

Mergers and acquisitions (**MERACQS**)

Merger and acquisition activities may be associated with discretionary accruals (Ruddock and Taylor, 2005). The acquiring company may manage earnings prior to acquisition to increase the share price (Koumanakos *et al.,* 2005). The higher value shares will be used to pay for the acquisition and therefore, the manipulation of earnings can ultimately result in a lower price for the acquisition (Koumanakos *et al.,* 2005). Ruddock and Taylor (2005) finds no significant relation between MERACQS and the absolute value of discretionary accruals. Ashbaugh *et al.* (2003) finds a significant positive relation between MERACQS and the absolute value of discretionary accruals. MERACQS is a dummy variable taking the value 1 if the company is engaged in a merger or acquisition during the year, 0 otherwise. A positive association between MERACQS and ABSDACC is expected.

Issue of equity (**EQUITY**)

Issues of new equity may be associated with higher abnormal accruals. Ashbaugh *et al.* (2003) and Ruddock and Taylor (2005) find a significant positive association between issue of new equity and the absolute value of discretionary accruals. Similar to Ruddock and Taylor (2005), EQUITY as a dummy variable is used

taking the value of 1 if the company issued equity during the year, 0 otherwise. A positive association between EQUITY and ABSDACC is expected.

Board independence (**BDINDP**)

Board composition will influence whether or not a company engages in earnings management (Xie *et al.,* 2003). The National Association of Corporate Directors (NACD, 1999) suggests that if audit committee members are independent of management, they are likely to be more effective in protecting the credibility of the firm's financial reporting. Klein (2002) documents that the presence of independent outside directors on the board is associated with lower levels of unexpected or discretionary accruals (in absolute terms). Xie *et al.* (2003) argues that companies with a greater proportion of independent directors will be less likely to engage in earnings management. The current study expects a negative association between BDINDP and ABSDACC.

Audit committee size (**ACSIZE**)

Audit committee size plays an important role in constraining earnings management (Zhou and Chen, 2004). For high earnings management banks, Zhou and Chen (2004) finds that audit committee size is significantly related to loan loss provision. However, Xie *et al.* (2003) finds no significant relation between audit committee size and earnings management as measured by discretionary current accruals. A negative association between ACSIZE and ABSDACC is expected.

Audit committee independence (**INDEPAC**)

Audit committee independence may affect earnings management. DeFond and Jiambalvo (1991) finds that firms with accounting errors are less likely to have audit committees. Klein (2006) finds a non-linear negative relation between audit committee

independence and earnings manipulation. Dechow *et al.* (1996) finds a negative relation between audit committee existence and the probability of manipulating earnings. The current study expects a negative association between INDEPAC and ABSDACC.

Year as dummies (**$YEAR_{03-05}$**)

Definition and reasons for use are the same as previously described.

3.2 CHAPTER SUMMARY

This chapter discusses the research methods adopted in this study and provides the calculation procedures for determining the interlocking variables. This chapter also includes model specifications for testing the hypotheses and provides definitions of the dependent variables and control variables. Chapter 4 provides details of the sample selection procedures, data collection procedures and other descriptive statistics for the sample companies and interlocking variables.

CHAPTER FOUR

DATA SOURCES, SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

4.0 INTRODUCTION

This chapter describes the sample and the data sources and provides descriptive statistics for the sample. The descriptive statistics include sample characteristics, board characteristics, audit committee characteristics, and interlocking scenarios of directors, director–audit firm/partner, audit committee members, and audit committee member–audit firm/partner for the sample of ASX listed companies during 2003–2005. This chapter also provides descriptive statistics for the positions held by directors and audit committee members of the sample companies during this period.

4.1 DATA SOURCES

Mostly hand collected data from annual reports of the companies, available either in the *AspectHuntley* or *Connect4* databases, is used. Some of the financial data were downloaded directly from the *AspectHuntley* database and verified with annual report information. Mergers and acquisitions data were collected from the SDC Platinum database. Audit firm/partner related data were collected directly from the audit reports published in company annual reports. The names of directors and audit committee members were also collected directly from annual reports. The data for the classification of directors and audit committee members as executive or non–executive were collected from the corporate governance or director report sections of the annual reports. The ASX database was used to collect the year of listing and GICS industry classification. The *AspectHuntley* database was used for the GICS industry codes.

A full list of directors and audit committee members was compiled for each company for each year separately.[35] From this data set, the surnames and two initials if used, otherwise one, of each individual director of each company, and also of each audit committee member of each company, were collected. Where only one initial was used, efforts were made to determine the first name in full and to check it with other sources.[36] Verification is necessary in the matching of director/audit committee member names and initials to verify whether the same individual is referenced in connection with more than one company (Jubb, 2000).

Names of all the directors were sorted according to their last names and identification was carried out where directors were members of other companies' boards. As a first step, the number of positions held by each director in other companies including his/her own company was calculated separately for 2003, 2004 and 2005. This procedure helps to identify each director and his/her position on other companies' boards to calculate the total number of board positions held by each director. The sample was then sorted according to the ASX code and the frequency of interlocking directors for each of the companies was calculated. The same procedure was followed for calculating audit committee member interlockings.

For calculating director–audit firm/partner interlocks, the names of the audit firms and their signing partners were collected from the audit reports of each company for each year separately. For identifying director–audit firm interlocks, the data were sorted according to directors' name and identification of the name of the audit firm

[35] To calculate interlocking, this study includes director if he/she attended at least one directors' meeting during the financial year and for audit committee member who has attended at least one audit committee meeting during the financial year.

[36] Sources were from the ASX web site, the *AspectHuntley database's* directors list for each company, or information from different sections in the annual report, or from the list of directors on the companies' websites.

corresponding to each director. When a director sat on more than one company's board and those companies were audited by the same audit firm, the situation was considered a director–audit firm interlocking. The interlocks created by each director and audit firm were identified and companies were sorted according to the ASX code and the director–audit firm interlocking frequencies were calculated.

For director–audit partner interlockings, the data were sorted according to directors' names, including the names of audit firms as well as signing audit partners. There is a necessary condition that to form a director–audit partner interlock there should be first a director–audit firm interlock. When there is director–audit firm interlock and those companies have a common signing audit partner, it creates a director–audit partner interlock. Similar procedures were followed separately for calculating audit committee member interlocking, audit committee member–audit firm interlocking and audit committee member–audit partner interlocking. An example of calculating frequencies of interlocking is shown in Chapter 3, Table 3.1.

4.2 SAMPLE DESCRIPTION

Financial data for the listed companies was downloaded from the *AspectHuntley's FinAnalysis* database.[37] The available number of companies was 1,473, 1,555 and 1,644 during 2003, 2004 and 2005 respectively. Companies were excluded from the final sample if their data were not available either in *AspectHuntley* or *Connect4* databases, if delisted during 2003, 2004 or 2005, if two audit firms/partners were named or if required data were missing. Companies having two audit firms/partners were excluded because it would be difficult to separate and calculate which audit firm/partner had more involvement or influence on the client (Jubb, 2000).

[37] *Connect4* database was used for annual reports of companies, *SDC Platinum* for mergers and acquisitions data and *ASX* database for industry classification and company age data.

The final sample consisted of 1,254 (85.13 per cent) of the available companies in 2003, 1,265 (81.35 per cent) in 2004 and 1,302 (79.20 per cent) in 2005.[38] The number of companies remaining after each deletion is shown in Table 4.1. The industry representation of the sample using GICS is shown in Table 4.2.

Table 4.1
Sample selection (number of companies)

Sample selection	2003	2004	2005
Total companies available in database	1,473	1,555	1,644
Companies delisted	176	225	176
Double audit firms/partners	5	5	5
Missing or non available data	38	60	161
Final Sample	**1,254**	**1,265**	**1,302**

The justification for using the data from 2003, 2004 and 2005 is that these were the most current years at the time this aspect of this study was completed. This study also included data from 2006 in order to calculate the discretionary accruals for the forward–looking Modified–Jones (1991) model. Furthermore, audit committees for many listed companies were voluntary before 2003. The ASX Corporate Governance Council (2003) and the CLERP 9 *Act* (2004) require audit committees for the Top 500 listed companies. The ASX amended its listing rules in 2003 to require any company that is included in the S&P/ASX All Ordinaries Index at the beginning of the financial year to have an audit committee during that year. These changes increased the rate of disclosure and made it easier to find the data for directors, audit committee members and other corporate governance mechanisms, which may not be disclosed in the earlier years. These features also give the opportunity of using audit committee members and audit firm/partner interlockings in an in–depth study of the ASX listed companies.

Table 4.2 provides details of the GICS 4–digit (6–digit for Materials) for the final sample. Comparative data for the population of all ASX listed companies shows the sample is representative. Industry representation shows that Metals and Mining is

[38] The sample used to calculate discretionary accruals is described in section 4.1.1.

Table 4.2
Sample companies –industry representation

Industry	GICS Industry Group (Industry Code)	Sample size			Sample%		
		2003	2004	2005	2003	2004	2005
1	Energy (1010)	78	79	87	6.22%	6.25%	6.68%
2	Chemicals (151010)	8	10	10	0.64%	0.79%	0.77%
3	Construction Materials (151020)	7	8	7	0.56%	0.63%	0.54%
4	Containers & Packaging (151030)	4	3	4	0.32%	0.24%	0.31%
5	Metals & Mining (151040)	297	300	341	23.68%	23.72%	26.19%
6	Paper & Forest Products (151050)	8	9	11	0.64%	0.71%	0.84%
7	Capital Goods (2010)	71	73	74	5.66%	5.77%	5.68%
8	Commercial Services & Supplies (2020)	55	56	56	4.39%	4.43%	4.30%
9	Transportation (2030)	22	21	20	1.75%	1.66%	1.54%
10	Automobile & Components (2510)	12	12	10	0.96%	0.95%	0.77%
11	Consumer Durables & Apparel (2520)	18	18	19	1.44%	1.42%	1.46%
12	Consumer Services (2530)	45	43	34	3.59%	3.40%	2.61%
13	Media (2540)	45	43	43	3.59%	3.40%	3.30%
14	Retailing (2550)	33	31	38	2.63%	2.45%	2.92%
15	Food & Staples Retailing (3010)	8	7	7	0.64%	0.55%	0.54%
16	Food, Beverages & Tobacco (3020)	45	45	38	3.59%	3.56%	2.92%
17	Health Care Equipment & Services (3510)	50	54	53	3.99%	4.27%	4.07%
18	Pharmaceuticals & Biotechnology (3520)	54	57	71	4.31%	4.51%	5.45%
19	Bank (4010)	12	13	14	0.96%	1.03%	1.08%
20	Diversified Financials (4020)	118	127	117	9.41%	10.04%	8.99%
21	Insurance (4030)	7	8	8	0.56%	0.63%	0.61%
22	Real Estate (4040)	81	84	77	6.46%	6.64%	5.91%
23	Software & Services (4510)	96	88	81	7.66%	6.96%	6.22%
24	Technology Hardware & Equipment (4520)	34	35	38	2.71%	2.77%	2.92%
25	Telecommunication Services (5010)	29	26	30	2.31%	2.06%	2.30%
26	Utilities (5510)	17	16	14	1.36%	1.26%	1.08%
Total		**1,254**	**1,265**	**1,302**	**100%**	**100%**	**100%**

the single largest industry making up 23.68 per cent of the sample in 2003, 23.72 per cent in 2004 and 26.19 per cent in 2005. This is followed by Diversified Financials, which represented 9.41 per cent, 10.04 per cent and 8.99 per cent of the sample respectively.

4.2.1 Sample for discretionary accruals model

A separate sample was used to calculate discretionary accruals due to the requirements of the Modified–Jones model. The Jones (1991) model or Modified–Jones models cannot be applied to the financial sector because accounting accruals are not comparable to those used by financial companies (Gupta *et al.,* 2008); hence it is necessary to exclude the entire financial sector (GICS industry code 4010 to 4040). Another condition of using the forward–looking Modified–Jones model is that there should be at least 10 observations for each industry in each year (Coulton *et al.,* 2005). For calculating discretionary accruals, it is also necessary to have sales revenue data for the following year, which is up to 2006 for this study, to calculate sales growth. Observations were excluded if they did not have the required data for using the forward–looking Modified–Jones model. Table 4.3 shows the final sample for calculating the discretionary accruals, which consisted of 948, 933 and 936 observations for the financial years 2003, 2004 and 2005 respectively. Table 4.4 shows the industry representation of the sample companies.

Table 4.3
Sample for calculating discretionary accruals

Sample	2003	2004	2005
Total companies in AspectHuntley's FinAnalysis database (as at 13/3/06)	1,473	1,555	1,644
Financial (4010 to 4040)	253	277	288
Food and Staples Retailing (3010)	8	7	6
Chemicals (151010)	9		
Construction Materials (151020)	9	8	8
Containers & Packaging (151030)	3	3	3
Paper & Forest Products (151050)		8	7
Companies delisted	176	225	176
Missing or non available data	67	94	220
Final sample	**948**	**933**	**936**

Empty cells show that there were at least 10 observations to calculate discretionary accruals.

Table 4.4
Industry representation of the sample companies for discretionary accruals

Industry	GICS Industry Group (Industry Code)	Sample size			Sample %		
		2003	**2004**	**2005**	**2003**	**2004**	**2005**
1	Energy (1010)	75	76	72	7.91%	8.15%	7.69%
2	Chemicals (151010)		10	10		1.07%	1.07%
3	Metals & Mining (151040)	282	279	295	29.75%	29.90%	31.52%
4	Paper & Forest Products (151050)	10			1.05%		
5	Capital Goods (2010)	67	68	66	7.07%	7.29%	7.05%
6	Commercial Services & Supplies (2020)	50	52	52	5.27%	5.57%	5.56%
7	Transportation (2030)	20	19	18	2.11%	2.04%	1.92%
8	Automobile & Components (2510)	11	11	11	1.16%	1.18%	1.18%
9	Consumer Durables & Apparel (2520)	18	18	17	1.90%	1.93%	1.82%
10	Consumer Services (2530)	40	37	35	4.22%	3.97%	3.74%
11	Media (2540)	43	42	37	4.54%	4.50%	3.95%
12	Retailing (2550)	29	30	32	3.06%	3.22%	3.42%
13	Food, Beverages & Tobacco (3020)	43	38	35	4.54%	4.07%	3.74%
14	Health Care Equipment & Services (3510)	47	49	48	4.96%	5.25%	5.13%
15	Pharmaceuticals & Biotechnology (3520)	52	56	59	5.49%	6.00%	6.30%
16	Software & Services (4510)	87	81	78	9.18%	8.68%	8.33%
17	Technology Hardware & Equipment (4520)	33	32	33	3.48%	3.43%	3.53%
18	Telecommunication Services (5010)	26	20	26	2.74%	2.14%	2.78%
19	Utilities (5510)	15	15	12	1.58%	1.61%	1.28%
Total		**948**	**933**	**936**	**100%**	**100%**	**100%**

The 4–digit (6–digit for Materials) 19 GICS industry classification (excludes all Financial sectors from 4010 to 4040) for ASX listed companies. The final sample also excludes Food & Staples Retailing (3010), Construction Materials (151020) and Containers & Packaging (151030) sectors, which had less than 10 companies per year. Missing cells show that these sectors did not have a minimum of 10 observations in order to calculate discretionary accruals.

4.3 DESCRIPTIVE STATISTICS AND INTERLOCKING CHARACTERISTICS OF THE SAMPLE COMPANIES

4.3.1 Characteristics of sample companies

Characteristics of the sample companies are shown in Table 4.5. The table shows that the average size of the sample companies (total assets) was $1,684 million. The average audit fees and auditor provided non–audit services (APNAS) fees for the sample companies were $228,173 and $181,793 respectively. On average, the companies had been listed on the ASX for 13.51 years. The average board size of the companies was 5.55, and 68 per cent of the board members were non–executive directors.[39] Kiel and Nicholson (2006) reports the average board size was 5.7 for 1,250 ASX companies during 2003 and this figure corresponds to other Australian studies (e.g., Stapledon and Lawrence, 1996; Arthur, 2001; Kiel and Nicholson, 2003).[40]

Fifty seven (57) per cent of the companies in the sample were audited by BIG 4 audit firms and the average audit firm tenure was 7.57 years.[41] The average partner tenure was 3.21 years. During the period of this study, 17 per cent of companies received other than unqualified audit opinions and there was a similar percentage in the previous year.[42] Seventy three per cent of the sample companies had audit committees during the period of study. The average size of the audit committee was 2.99. For the sample of companies that had audit committees during the period of study, 73 per cent of audit committees had majority of non–executive directors (n = 874, 915 and 990 respectively for 2003, 2004 and 2005).

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[39] Due to the inclusion of both small and large companies, the average board size is lower than in other studies. Kiel and Nicholson (2006) reports that average board size for the top 100 companies was 8.2; for the top 200 companies was 7.6. For companies ranked 201 to 1250 it was 5.2; and for all companies it was 5.7 during 2003.

[40] Stening and Wan (1984) reports the average board size was 6.6 in 1959 and 8.4 in 1979 for the largest 250 Australian companies. Alexander and Murray (1992) reports the average board size of the top 250 Australian companies was 6.6 in 1959, 9.33 in 1979, 8.62 in 1986 and 8.37 in 1991. Jubb (2000) reports the average board sizes for the top 319 Australian companies was 7.07 in 1990.

[41] Jubb (2000) reports that 60 per cent of her sample companies were audited by the Big 6 in 1990 for the top 319 ASX companies.

[42] Jubb (2000) reports that 16.6 per cent of her sample companies received a qualified opinion in 1990.

Table 4.5
Descriptive statistics for the sample companies

Variables	2003 (n = 1,254)			2004 (n = 1,265)			2005 (n = 1,302)			Combined (N = 3,821)		
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
Total Assets ($M)	1,486	19	16,287	1,656	23	18,015	1,901	24	19,009	1,684	22	17,818
Audit Fees (AF) ($)	195,621	44,500	755,952	211,534	47,000	809,810	275,690	53,200	1,054,646	228,173	47,000	885,700
APNAS fees ($)	198,178	15,000	1,156,787	172,064	16,000	761,383	175,463	13,817	811,573	181,793	15,,000	924,771
LnTA	17.11	16.75	2.45	17.31	16.95	2.36	17.38	16.99	2.40	17.27	16.91	2.40
LnAF	10.89	10.70	1.36	10.96	10.76	1.35	11.08	10.88	1.39	10.98	10.76	1.37
LnAPNAS	8.04	9.62	4.68	8.13	9.68	4.64	7.89	9.53	4.75	8.02	9.62	4.69
BDSIZE	5.68	5.00	2.14	5.58	5.00	2.10	5.39	5.00	2.02	5.55	5.00	2.09
BOARDINDP	0.68	0.71	0.19	0.68	0.71	0.19	0.69	0.71	0.19	0.68	0.71	0.19
ACSIZE	2.96	3.00	0.98	2.97	3.00	1.00	3.03	3.00	1.01	2.99	3.00	1.00
INDEPAC	0.68	1.00	0.46	0.75	1.00	0.44	0.63	1.00	0.45	0.73	1.00	0.44
AC	0.70	1.00	0.46	0.72	1.00	0.46	0.76	1.00	0.43	0.73	1.00	0.45
BIG4	0.60	1.00	0.49	0.58	1.00	0.49	0.54	1.00	0.49	0.57	1.00	0.49
AGE (years)	13.10	10.00	10.55	13.60	11.00	10.93	13.81	11.00	11.38	13.51	11.00	10.96
PQUAL	0.18	0.00	0.38	0.19	0.00	0.39	0.15	0.00	0.36	0.17	0.00	0.38
AFTENURE	7.42	5.00	7.00	7.73	5.00	7.20	7.55	5.00	7.14	7.57	5.00	7.12
APTENURE	3.00	2.00	1.98	3.13	3.00	1.89	3.48	3.00	2.82	3.21	3.00	2.28

Total assets in millions of dollars; AF = audit fees; APNAS = auditor provided for non–audit services fees; LnTA = natural log of total assets; LnAF = natural log of audit fee; LnAPNAS = natural log of auditor provided non–audit services fee; BDSIZE = number of board members; BOARDINDP = percentage of non–executive directors on board; ACSIZE = number of members in audit committee; INDEPAC = 1 if fifty per cent or more of non–executive members on audit committee, 0 otherwise; BIG 4 = 1 if the audit firm is BIG 4, 0 otherwise; AGE = number of years of listing the company on the ASX; PQUAL = 1 if the company has other than an unqualified opinion in the previous year, 0 otherwise; AFTENURE = number of years audit firm has been engaged with the current client; APTENURE = number of years the audit partner has been engaged with the current client.

4.3.2 Interlocking links of sample companies

A summary of the number of interlocked companies is shown in Table 4.6 for 2003, 2004 and 2005 respectively. The percentages (number) of companies with at least one common director interlock were 85.65 per cent (1,074), 84.58 per cent (1,070) and 85.02 per cent (1,107) for the sample companies.[43] This result indicates that the majority of ASX listed companies during the sample period were linked by common directors.

Interlocking companies with at least one common director and a common audit firm link were 45.45 per cent (570), 43.87 per cent (555) and 42.01 per cent (547) for the sample companies during 2003, 2004 and 2005 respectively. This result indicates that almost half of the sample companies were linked by common directors and those companies were audited by a common audit firm.[44]

Two companies may be audited by a common audit firm. However, the signing audit partner may not be common (Jubb, 2000). The percentages (number) of companies that had director–audit firm interlocking and engaged a common audit partner from the same audit firm were 20.26 per cent (254), 19.68 per cent (249) and 20.12 per cent (262) during 2003, 2004 and 2005 respectively.[45]

There were a substantial number of interlockings among audit committee members and audit firms/partners for the ASX listed companies. The percentages (number) of companies linked by common audit committee members were 43.54 per

[43] Jubb (2000) reports that the companies with at least one common director interlock were 79.40 per cent using a sample of the top 319 ASX listed companies for 1990.
[44] Jubb and Houghton (1999) and Jubb (2000) report that 50.30 per cent of the top 319 ASX companies had at least one common director–audit firm link in 1990.
[45] Jubb and Houghton (1999) and Jubb (2000) report that 20.00 per cent of the top 319 ASX companies had at least one common director–audit partner link in 1990.

Table 4.6
A summary of the number of interlocked companies

Variables	2003		2004		2005		Combined	
	Total (n = 1,254)	Percentage	Total (n = 1,265)	Percentage	Total (n = 1,302)	Percentage	Total (N = 3,821)	Percentage
DLKS	1,074	85.65%	1,070	84.58%	1,107	85.02%	3,251	85.08%
DAFLKS	570	45.45%	555	43.87%	547	42.01%	1,672	43.76%
DAPLKS	254	20.26%	249	19.68%	262	20.12%	765	20.02%
ACLKS	546	43.54%	593	46.88%	670	51.46%	1,809	47.34%
ACAFLKS	227	18.10%	252	19.92%	288	22.12%	767	20.07%
ACAPLKS	78	6.22%	76	6.01%	104	7.99%	258	6.75%

DLKS = director interlocks; DAFLKS = director–audit firm interlocks; DAPLKS = director–audit partner interlocks; ACLKS = audit committee member interlocks; ACAFLKS = audit committee member–audit firm interlocks; ACAPLKS = audit committee member–audit partner interlocks.
Number and percentages of sample companies which had at least one interlock (for each of the interlocking variables separately) link with other company(ies).

cent (546) during 2003, which increased to 46.88 per cent (593) in 2004 and to 51.46 per cent (670) in 2005 for the sample companies. The percentages (number) of companies that had audit committee member interlocking where those companies were audited by a common audit firm were 18.10 per cent (227), 19.92 per cent (252) and 22.12 per cent (288) during 2003, 2004 and 2005 respectively. The percentages (number) of companies that had common audit committee member–audit firm interlocking where those companies also had a common signing audit partner were 6.22 per cent (78), 6.01 per cent (76) and 7.99 per cent (104) during 2003, 2004 and 2005 respectively for the sample of companies.

4.3.3 Interlocking characteristics of sample companies

Table 4.7 shows the interlocking characteristics of sample companies during 2003–2005. For the sample companies, 14.35 per cent, 15.34 per cent and 14.98 per cent had no director interlocking during 2003, 2004 and 2005 respectively. For the sample companies 12.84 per cent, 13.36 per cent and 13.29 per cent had at least one director interlock during 2003, 2004 and 2005 respectively. During the period of study, 42.34 per cent, 39.05 per cent and 39.40 per cent respectively of the sample companies had five or more director interlocks.[46]

For the sample companies, 54.55 per cent, 56.13 per cent and 57.99 per cent of sample companies had no director–audit firm interlock during 2003, 2004 and 2005 respectively, while 79.67 per cent, 80.32 per cent and 79.88 per cent had no director–audit partner interlock. For the sample companies 8.77 per cent, 7.59 per cent and 7.37

[46] The Australian Shareholders' Association (ASA) claims that there is a link between companies with difficulties and the workloads of their board of directors (Galacho, 2004). The ASA also believes that any director who sits on more than five publicly listed boards is doing a disservice to the companies' shareholders (Kiel and Nicholson, 2006).

Table 4.7

Interlocking characteristics of sample companies during 2003-2005

Year		TDLKS		TDAFLKS		TDAPLKS		TACLKS		TACAFLKS		TACAPLKS	
	Number of interlocks	Number of companies	% of companies	Number of companies	% of companies	Number of companies	% of companies	Number of companies	% of companies	Number of companies	% of companies	Number of companies	% of companies
2003	0	180	14.35%	684	54.55%	1,000	79.67%	328	37.53%	647	74.03%	796	91.08%
	1	161	12.84%	216	17.22%	91	7.26%	196	22.43%	134	15.33%	46	5.26%
	2	132	10.53%	104	8.29%	49	3.91%	138	15.79%	50	5.72%	13	1.49%
	3	135	10.77%	81	6.46%	29	2.31%	66	7.55%	18	2.06%	6	0.69%
	4	115	9.17%	59	4.70%	22	1.75%	46	5.26%	9	1.03%	7	0.80%
	≥ 5	531	42.34%	110	8.77%	64	5.10%	100	11.44%	16	1.83%	6	0.67%
Total number of companies		**1,254**	**100%**	**1,254**	**100%**	**1,254**	**100%**	**874**	**100%**	**874**	**100%**	**874**	**100%**
2004	0	194	15.34%	710	56.13%	1016	80.32%	325	35.52%	664	72.57%	840	91.80%
	1	169	13.36%	197	15.57%	102	8.06%	211	23.06%	138	15.08%	33	3.61%
	2	140	11.07%	123	9.72%	48	3.79%	143	15.63%	65	7.10%	22	2.40%
	3	158	12.49%	81	6.40%	29	2.29%	73	7.98%	24	2.62%	4	0.44%
	4	110	8.70%	58	4.58%	17	1.34%	57	6.23%	7	0.77%	5	0.55%
	≥ 5	494	39.05%	96	7.59%	53	4.19%	106	11.59%	17	1.86%	11	1.20%
Total number of companies		**1,265**	**100%**	**1,265**	**100%**	**1,265**	**100%**	**915**	**100%**	**915**	**100%**	**915**	**100%**
2005	0	195	14.98%	755	57.99%	1040	79.88%	322	32.53%	703	71.01%	887	89.60%
	1	173	13.29%	197	15.13%	110	8.45%	220	22.22%	164	16.57%	68	6.87%
	2	168	12.90%	136	10.45%	57	4.38%	147	14.85%	78	7.88%	16	1.62%
	3	133	10.22%	72	5.53%	27	2.07%	95	9.60%	23	2.32%	7	0.71%
	4	120	9.22%	46	3.53%	14	1.08%	82	8.28%	14	1.41%	9	0.91%
	≥ 5	513	39.40%	96	7.37%	54	4.15%	124	12.52%	8	0.81%	3	0.03%
Total number of companies		**1,302**	**100%**	**1,302**	**100%**	**1,302**	**100%**	**990**	**100%**	**990**	**100%**	**990**	**100%**

TDLKS = total number of director interlocks; TDAFLKS = total number of director–audit firm interlocks; TDAPLKS = total number of director–audit partner interlocks; TACLKS = total number of audit committee member interlocks; TACAFLKS = total number of audit committee member–audit firm interlocks; TACAPLKS = total number of audit committee member–audit partner interlocks.

per cent respectively had five or more director–audit firm interlocks while 5.10 per cent, 4.19 per cent and 4.15 per cent respectively had five or more director–audit partner interlocks. This finding indicates a substantial number of director–audit firm/partner interlocks for ASX listed companies.

The interlocking scenarios for audit committee member and audit committee member and audit firm/partner are also shown in Table 4.7 (companies that had audit committees during the period of study). Table 4.7 shows that 37.53 per cent, 35.52 per cent and 32.53 per cent respectively of sample companies had no audit committee member interlocking during the period of study. For the sample companies 11.44 per cent, 11.59 per cent and 12.52 per cent respectively had five or more audit committee member interlocks. For the sample companies 74.03 per cent, 72.57 per cent and 71.01 per cent respectively had no audit committee member–audit firm interlocks while 91.08 per cent, 91.80 per cent and 89.60 per cent respectively had no audit committee–audit partner interlocks. For the sample companies 1.83 per cent, 1.86 per cent and 0.81 per cent respectively had five or more audit committee member–audit firm interlockings while 0.67 per cent, 1.20 per cent and 0.03 per cent had five or more audit committee member–audit partner interlocking during the period of study. This finding also provides evidence that a large number of ASX listed companies were linked by audit committee member and audit committee member–audit firm/partner for the sample companies during the period of study.

4.3.4 Board of director characteristics

The number of board positions held by executive and non–executive directors during 2003, 2004 and 2005 for the sample companies are shown in Table 4.8. There were 7,320, 7,353 and 7,665 board positions associated with 1,254, 1,265 and 1,302 of

sample companies during the financial years 2003, 2004 and 2005 respectively. The majority of the board positions were held by non–executive directors, which was 68.40 per cent (5,007) in 2003, 68.11 per cent (5,008) in 2004 and 69.17 per cent (5,302) in 2005 for the sample companies. At the same time, the executive directors held only 31.60 per cent (2,313), 31.89 per cent (2,345) and 30.81 per cent (2,363) of board positions respectively.[47]

Table 4.8
The number of board position held by executive and non-executive directors during 2003-2005 for the sample companies

Board characteristics	2003		2004		2005	
	Number	Percentage	Number	Percentage	Number	Percentage
No. of Companies	1,254		1,265		1,302	
Board seats	7,320		7,353		7,665	
Positions held by executive directors	2,313	31.60%	2,345	31.89%	2,363	30.81%
Positions held by non–executive directors	5,007	68.40%	5,008	68.11%	5,302	69.17%

From this result, it is clear that the majority of the board positions for the ASX listed companies were held by non–executive directors. This finding is consistent with the Australian Corporate Practices and Conduct Guidelines (1995) and ASX Principles of Good Corporate Governance and Best Practice (2003) recommendations, where it is suggested that boards of listed public companies be comprised of a majority of non–executive directors.

4.3.5 The number of directorships per director

Table 4.9 reports the results of multiple directorships within the ASX listed companies during 2003–2005 held by individuals sitting on the boards of the 1,254, 1,265 and 1,302 sample companies respectively. There were 7,320, 7,353 and 7,665 board positions in the sample companies, which were held by 5,468, 5,538 and 5,720

[47] Clifford and Evans (1997) finds approximately a two-thirds (66.10 per cent) majority of non-executive directors boards for Australian companies and this finding is consistent with previous studies (e.g., McMichael, 1976; Hunt, 1984; Logan and Dunstan, 1993; Clifford and Evans, 1996).

individuals during 2003, 2004 and 2005 respectively. The average directorship per director was 1.34, 1.33 and 1.34 respectively for the sample companies.[48]

Out of 5,468 directors for the sample companies during 2003, 4,316 (78.93 per cent) held only one directorship. Kiel and Nicholson (2006) reports this as 78.95 per cent for 2003. There were 751 individuals (13.73 per cent) who held two directorships. Kiel and Nicholson (2006) reports 13.42 per cent. There were 65 (1.18 per cent) individuals who held between five and eight directorships. There were two directors who held ten directorships during 2003.

The scenario for individual board membership and multiple directorships during 2004 and 2005 was almost the same in 2003. There were 7,353 and 7,665 board positions during 2004 and 2005 for the sample companies and among them 4,416 (79.74 per cent) and 4,519 individuals (79.00 per cent) held only one board position. There were 735 (13.27 per cent) and 752 (13.15 per cent) individuals who held two positions each during 2004 and 2005 respectively. There were 385 individuals (6.96 per cent) who held at least three and a maximum of eight positions in 2004 and 447 (7.81 per cent) in 2005. There were two individuals who held ten positions each during 2004 for the sample companies. There were two individuals who held nine positions in 2005.

[48] Alexander and Murray (1992) reports the average directorship per director was 1.16 in 1959, 1.29 in 1979, 1.31 in 1986, and 1.19 in 1991 for the top 250 Australian companies. Jubb (2000) reports the average directorship per director was 1.38 for the top 319 Australian companies in 1990. Kiel and Nicholson (2006) reports that the average directorship per director was 1.3 for 1,250 ASX listed companies during 2003.

Table 4.9

Summary of the number of directorships per director during 2003-2005

Number of directorships	2003 (n = 1,254)				2004 (n = 1,265)				2005 (n = 1,302)			
	Frequency	Percentage of individual director	Total number of directorships	Percentage of directorships	Frequency	Percentage of individual director	Total number of directorships	Percentage of directorships	Frequency	Percentage of individual director	Total number of directorships	Percentage of directorships
1	4,316	78.93%	4,316	58.96%	4,416	79.74%	4,416	60.06%	4,519	79.00%	4,519	58.96%
2	751	13.73%	1,502	20.52%	735	13.27%	1,470	19.99%	752	13.15%	1,504	19.62%
3	232	4.24%	696	9.51%	210	3.79%	630	8.57%	272	4.76%	816	10.65%
4	102	1.87%	408	5.57%	104	1.88%	416	5.66%	103	1.80%	412	5.38%
5	33	0.60%	165	2.25%	43	0.78%	215	2.92%	47	0.82%	235	3.07%
6	16	0.29%	96	1.31%	12	0.22%	72	0.98%	14	0.24%	84	1.10%
7	11	0.20%	77	1.05%	14	0.25%	98	1.33%	11	0.19%	77	1.00%
8	5	0.09%	40	0.55%	2	0.04%	16	0.22%	0	0.00%	0	0.00%
9	0	0.00%	0	0.00%	0	0.00%	0	0.00%	2	0.03%	18	0.23%
10	2	0.04%	20	0.27%	2	0.04%	20	0.27%	0	0.00%	0	0.00%
Total	**5,468**	**100%**	**7,320**	**100%**	**5,538**	**100%**	**7,353**	**100%**	**5,720**	**100%**	**7,665**	**100%**

4.3.6 Descriptive statistics for director interlocking, director–audit firm/partner interlocking

The descriptive statistics for director interlocking, director–audit firm interlocking, and director–audit partner interlocking are shown in Table 4.10. The maximum number of links of common (total) director interlocking was 29 (33), 26 (37) and 21 (35) respectively during 2003, 2004 and 2005, which indicates the links created by the boards of directors of a focal company with other companies. The mean common (total) director interlocking was 4.23 (5.06), 3.99 (4.81) and 3.86 (4.59) during 2003, 2004 and 2005 respectively.[49]

The maximum number of interlocks created by common (total) director and a common audit firm was 9 (24), 7 (22) and 9 (21) respectively during the period of the study. The average number of common (total) director–audit firm interlocking was 0.94 (1.46), 0.90 (1.35) and 0.84 (1.25) during the period of the study.[50] The maximum number of common (total) interlocking between common director and audit partners was 6 (19), 8 (20) and 7 (21) during 2003, 2004 and 2005 for the sample companies. The mean for the same was 0.31 (0.72), 0.29 (0.64) and 0.31 (0.64) respectively during the period of the study.

[49] Hall (1983) reports the mean for director interlocks was 5.6 in 1971, 5.4 in 1972, 5.8 in 1973 and 5.4 in 1974 for 1200 Australian companies. Davison *et al.* (1984) reports the average number of directors' interlocks was 5.65 for the top 250 companies. Jubb (2000) reports 3.38 during 1990 for the top 319 ASX listed companies.

[50] Davison *et al.* (1984) reports that the average number of director–audit firm interlocks was 0.65. Jubb (2000) reports the average was 0.55.

Table 4.10
Descriptive statistics for director interlocking, and director–audit firm/partner interlocking

Interlocking variables	2003 (n = 1,254)					2004 (n = 1,265)					2005 (n = 1,302)				
	Minimum	Maximum	Mean	Median	Std. Deviation	Minimum	Maximum	Mean	Median	Std. Deviation	Minimum	Maximum	Mean	Median	Std. Deviation
TDLKS	0	33	5.06	4.00	5.103	0	37	4.81	3.00	5.052	0	35	4.59	3.00	4.616
DLKS	0	29	4.23	3.00	4.106	0	26	3.99	3.00	3.769	0	21	3.86	3.00	3.569
TDAFLKS	0	24	1.46	0.00	2.753	0	22	1.35	0.00	2.537	0	21	1.25	0.00	2.429
DAFLKS	0	9	0.94	0.00	1.427	0	7	0.90	0.00	1.340	0	9	0.84	0.00	1.320
TDAPLKS	0	19	0.72	0.00	2.125	0	20	0.64	0.00	2.044	0	21	0.64	0.00	2.058
DAPLKS	0	6	0.31	0.00	0.750	0	8	0.29	0.00	0.720	0	7	0.31	0.00	0.776

TDLKS = total number of director interlocks; DLKS = director interlocks; TDAFLKS = total number of director–audit firm interlocks; DAFLKS = director–audit firm interlocks; TDAPLKS = total number of director–audit partner interlocks; DAPLKS = director–audit partner interlocks.

4.3.7 Audit committee characteristics

Audit committee (AC) characteristics are shown in Table 4.11. During the period of the study, 69.70 per cent (874) in 2003, 72.27 per cent (915) in 2004 and 76.04 per cent (990) in 2005 of sample companies had audit committees. This result indicates that the number of audit committees for ASX listed companies has increased over time. During these periods, the majority of the audit committee members were non–executive directors (61.75 per cent, 62.71 per cent and 64.41 per cent respectively). During the same period, 38.25 per cent, 37.29 per cent and 35.59 per cent of the members of the audit committees were executive directors. The higher percentage of executive directors in the audit committees may be due to including small companies in the sample, which had very few non–executive directors on their boards.

Table 4.11
Audit committee characteristics during 2003-2005 for the sample companies

Audit Committee (AC)	2003 (n = 1,254)		2004 (n = 1,265)		2005 (n = 1,302)	
	Total	Percentage	Total	Percentage	Total	Percentage
Companies with an AC	874	69.70%	915	72.27%	990	76.04%
Non–executive AC members	1,605	61.75%	1,724	62.71%	2,034	64.41%
Executive AC members	994	38.25%	1,025	37.29%	1,124	35.59%
Total AC members	2,599	100%	2,749	100%	3,158	100%

4.3.8 The number of audit committee memberships per audit committee member

Audit committee memberships per audit committee member are shown in Table 4.12. During 2003, there were 2,100 individuals who held 2,599 audit committee positions. The same statistics were 2,179 and 2,747 in 2004 and 2,450 and 3,158 in 2005 for the sample companies. There were 1,757 (83.67 per cent), 1,778 (81.60 per cent) and 1,965 (80.20 per cent) individuals who held only one audit committee member position during 2003, 2004 and 2005 respectively. During the period of study, 11.38 per cent (239), 13.54 per cent (295) and 13.51 per cent (331) of individuals respectively held two audit committee memberships. There were 104 (4.95 per cent) individuals who held at least three but less than six audit committee positions during 2003 and this

Table 4.12

Summary of the number of audit committee memberships per audit committee member during 2003-2005 for the sample companies

Number of Audit Committee (AC) memberships	2003 (n = 874)				2004 (n = 915)				2005 (n = 990)			
	Frequency	Percentage of individual AC members	Total number of AC memberships	Percentage of AC memberships	Frequency	Percentage of individual AC members	Total number of AC memberships	Percentage of AC memberships	Frequency	Percentage of individual AC members	Total number of AC memberships	Percentage of AC memberships
1	1,757	83.67%	1,757	67.60%	1,778	81.60%	1,778	64.73%	1,965	80.20%	1,965	62.22%
2	239	11.38%	478	18.39%	295	13.54%	590	21.48%	331	13.51%	662	20.96%
3	70	3.33%	210	8.08%	64	2.94%	192	6.99%	102	4.16%	306	9.69%
4	20	0.95%	80	3.08%	29	1.33%	116	4.22%	36	1.47%	144	4.56%
5	10	0.48%	50	1.92%	9	0.41%	45	1.64%	15	0.61%	75	2.37%
6	4	0.19%	24	0.92%	2	0.09%	12	0.44%	1	0.04%	6	0.19%
7	0	0.00%	0	0.00%	2	0.09%	14	0.51%	0	0.00%	0	0.00%
Total	**2,100**	**100%**	**2,599**	**100%**	**2,179**	**100%**	**2,747**	**100%**	**2,450**	**100%**	**3,158**	**100%**

number was almost the same during 2004 and 2005. There were two individuals who held more than seven audit committee memberships during 2004. This finding indicates that around one–fifth of audit committee members had more than one audit committee membership in other companies during the period of study.

4.3.9 Descriptive statistics for audit committee member interlocking, audit committee member–audit firm/partner interlocking

An audit committee member sitting on more than one audit committee creates audit committee member interlocking. Most audit committee members were non–executive directors, who may have had more experience and expertise to provide audit committee related services in more than one company than executive directors who were working full–time. Table 4.13 reveals that the maximum numbers of common (total) audit committee member interlockings were 11 (16) during 2003, 11 (11) in 2004 and 12 (13) in 2005. The means for the same were 1.11 (1.19), 1.19 (1.30) and 1.42 (1.48) respectively during the period of the study for the sample companies.

When interlocking audit committee members come into contact with a common audit firm in other companies, it creates an audit committee member–audit firm interlocking. The maximum numbers of common (total) links created by audit committee member and audit firm were 6 (6), 4 (9) and 4 (10) respectively during 2003, 2004 and 2005. The means for the same were 0.27 (0.33), 0.32 (0.39) and 0.33 (0.39) respectively during the period of the study. When audit committee member–audit firm interlocking companies have a common audit partner, it creates audit committee member–audit partner interlocking. The maximum numbers of common (total) audit committee member and audit partner interlocking were 3 (6), 3 (9) and 3 (10)

Table 4.13

Descriptive statistics of audit committee member interlocking, audit committee member–audit firm/partner interlocking

Audit committee members interlocking variables	2003 (n = 874)					2004 (n = 915)					2005 (n = 990)				
	Minimum	Maximum	Mean	Median	Std. Deviation	Minimum	Maximum	Mean	Median	Std. Deviation	Minimum	Maximum	Mean	Median	Std. Deviation
TACLKS	0	16	1.19	0.00	1.928	0	11	1.30	0.00	1.995	0	13	1.48	1.00	2.065
ACLKS	0	11	1.11	0.00	1.739	0	11	1.19	0.00	1.790	0	12	1.42	1.00	1.946
TACAFLKS	0	6	0.33	0.00	0.895	0	9	0.39	0.00	1.079	0	10	0.39	0.00	0.959
ACAFLKS	0	6	0.27	0.00	0.668	0	4	0.32	0.00	0.722	0	4	0.33	0.00	0.710
TACAPLKS	0	6	0.12	0.00	0.592	0	9	0.15	0.00	0.783	0	10	0.15	0.00	0.719
ACAPLKS	0	3	0.08	0.00	0.329	0	3	0.08	0.00	0.351	0	3	0.10	0.00	0.363

TACLKS = total number of audit committee member interlocks; ACLKS = audit committee member interlocks; TACAFLKS = total number of audit committee member–audit firm interlocks; ACAFLKS = audit committee member–audit firm interlocks; TACAPLKS = total number of audit committee member–audit partner interlocks; ACAPLKS = audit committee member–audit partner interlocks.

respectively during the period of the study for the sample companies. The means for the same were 0.08 (0.12), 0.08 (0.15) and 0.10 (0.15) respectively.

4.4 CONCLUSION

The foregoing descriptive statistics provide evidence of a substantial number of interlockings among directors and/or audit committee members and an audit firm/partner during the period 2003–2005 for the sample companies. The majority of the sample companies were linked by common directors and/or audit committee members and many of those companies also had a common audit firm/partner. Chapter 5 reports descriptive statistics and results for the APNAS fees and AFTENURE models. Chapter 6 provides the results for the OPINION and discretionary accruals models.

CHAPTER FIVE

RESULTS AND DISCUSSION OF AUDITOR INDEPENDENCE MODELS

5.0 INTRODUCTION

This chapter provides the results of applying the auditor independence models. First, this chapter provides descriptive statistics, audit and non–audit fee differences between interlocking and non–interlocking companies and correlation coefficients for the variables in the auditor provided non–audit services (APNAS) fee model, followed by regression results and sensitivity analyses. Second, this chapter provides descriptive statistics, differences in audit firm tenure between interlocking and non–interlocking companies and correlation coefficients for the audit firm tenure (AFTENURE) model variables. These are followed by regression results for the second measure of auditor independence, examining the association between AFTENURE and interlockings. Various sensitivity tests are also conducted to validate the estimated models.

5.1 AUDITOR INDEPENDENCE

The following sections discuss the results from applying the APNAS fee model:

5.1.1 AUDITOR PROVIDED NON–AUDIT SERVICES FEES

APNAS fee is the first dependent variable used in testing the interlocking hypotheses. The dependent variable, LnAPNAS, is the natural log transformation of auditor provided non–audit services fees[51] received by the incumbent auditors from the individual clients. The following sections provide the descriptive statistics for variables included in the APNAS fee model.

[51] Following the study of Ashbaugh *et al.* (2003), this study sets APNAS fees to one dollar for firms reporting zero APNAS fees to allow for log transformation.

5.1.1.1 Descriptive statistics

The descriptive statistics for the sample companies are shown in Table 5.1. The average size (total assets) for the sample companies was $1,684 million. The average audit fee (AF) for the sample companies was $228,172. The average APNAS fee was $181,792, which was substantially lower than the average audit fee, supporting the findings of Buffini (2006).[52] During the period of study, 57 per cent of the sample companies were audited by BIG 4 audit firms. These characteristics are consistent with the findings of other Australian studies (e.g., Jubb and Houghton, 1999; Jubb, 2000, Ruddock and Taylor, 2005).

Table 5.1
Descriptive statistics for the LnAPNAS fee model variables
(N = 3,821)

Variables	Mean	Median	Std. Deviation
Audit fees ($)	228,172.00	47,000	885,700.00
APNAS fee ($)	181,792.00	15,000	924,770.00
DLKS	4.03	3.00	3.82
DAFLKS	0.89	0.00	1.36
DAPLKS	0.30	0.00	0.75
ACLKS	1.24	0.00	1.83
ACAFLKS	0.31	0.00	0.70
ACAPLKS	0.09	0.00	0.35
Total assets ($M)	1,684.00	22.00	17,818.00
BIG4	0.57	1.00	0.50
LEVERAGE	0.43	0.33	0.67
EQUITY	0.57	1.00	0.47
ROA	-0.12	-0.01	0.61
NEG_ROA	0.52	1.00	0.50
INITIAL	0.22	0.00	0.42
MERACQS	0.16	0.00	0.36
MB	-5.20	1.58	37.65
BDINDP	0.68	0.71	0.19
ACSIZE	2.99	3.00	1.00
INDEPAC	0.73	1.00	0.44

APNAS = auditor provided non–audit services fees; DLKS = director interlocks; DAFLKS = director and audit firm interlocks; DAPLKS = director and audit partner interlocks; ACLKS = audit committee member interlocks; ACAFLKS = audit committee member and audit firm interlocks; ACAPLKS = audit committee member and audit partner interlocks; BIG 4 = 1 if company's incumbent auditor is a BIG 4 audit firm, 0 otherwise; LEVERAGE = ratio of total liabilities to total assets; EQUITY = 1 if the firm issues any new equity during the year, 0 otherwise ROA = operating income divided by average total

[52] Buffini (2006) reports that the consulting fees fell for the third year in a row since 2001, which might be supported by the two complementary issues. Buffini (2006) argues that he first one is that the Australian listed companies' audit fees were expected to rise by 10 to 30 per cent due to the introduction of new international accounting standards in 2005, and the second was the controversy over auditors' provision of non-audit services and auditor independence and audit quality after the collapse of major companies, which may have decreased APNAS fees.

assets; NEG_ROA = 1 if the firm reports negative return on assets in the current year, 0 otherwise; INITIAL = 1 if the audit firm engagement is either in the first or second year with the current auditee, 0 otherwise; MERACQS = 1 if the firm was engaged in a merger/acquisition activity during the year, 0 otherwise; MB = market–to–book ratio at fiscal–year–end; BDINDP = 1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; ACSIZE = number of audit committee members; INDEPAC = 1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise.

5.1.1.2 Comparison of fees between interlocking and non–interlocking companies

Descriptive statistics for the final sample of 3,821 companies for the three audit fee metrics are shown in Table 5.2. The main interest in this section of this study is to investigate any differences in audit fees, APNAS fees and total audit plus APNAS (TOTAL) fees between interlocking and non–interlocking companies. The average audit fees of director interlocking (DLKS) and non–interlocking companies were $256,220 and $68,203 respectively. The average APNAS fees were $206,754 and $39,428 respectively. The average audit fees and APNAS fees of director interlocking companies were significantly different ($p < 0.001$) and higher than those of non–interlocking companies. This result indicates that director interlocking companies had higher audit and APNAS fees compared to non–interlocking companies.

The average audit fees of DAFLKS and non–interlocking companies were $390,878 and $101,582 respectively. The average APNAS fees were $318,580 and $75,367 respectively. The average of both audit and APNAS fees of DAFLKS were higher than those for non–interlocking companies and were significantly different ($p < 0.001$). This result indicates that director–audit firm interlocking companies also had higher audit and APNAS fees than those of non–interlocking companies. Additionally, both the average audit fees and APNAS fees of DAPLKS and non–interlocking companies were significantly different indicating that there were significant differences in audit fees and APNAS fees between DAPLKS and non–interlocking companies. However, both the average audit and APNAS fees of DAPLKS companies were lower

Table 5.2
Fee metrics for interlocking and non–interlocking companies

Variables	Interlocking Companies (1)		Non–interlocking Companies (0)		t–test for Equality of Means	
	Mean	Std. Deviation	Mean	Std. Deviation	t	p–value (two-tailed)
	DLKS 1: sample (n = 3,251)		**DLKS 0: sample (n = 570)**			
AF	256,220	956,831	68,203	84,386	4.688	<0.001
APNAS	206,754	999,819	39,428	88,626	3.992	<0.001
TOTAL	462,974	1,848,229	107,631	155,144	4.587	<0.001
	DAFLKS 1: sample (n = 1,672)		**DAFLKS 0: sample (n = 2,149)**			
AF	390,878	1,283,031	101,582	279,006	10.149	<0.001
APNAS	318,580	1,331,733	75,367	339,587	8.133	<0.001
TOTAL	709,458	2,466,219	176,949	589,596	9.661	<0.001
	DAPLKS 1: sample (n = 765)		**DAPLKS 0: sample (n = 3,056)**			
AF	152,529	601,629	247,108	942,652	-2.643	0.008
APNAS	109,946	371,949	199,778	1,016,434	-2.404	0.016
TOTAL	262,475	902,301	446,886	1,856,907	-2.669	0.008
	ACLKS 1: sample (n = 1,809)		**ACLKS 0: sample (n = 2,012)**			
AF	393,295	1,175,232	79,710	449,227	11.101	<0.001
APNAS	323,628	1,248,366	54,268	434,775	9.085	<0.001
TOTAL	716,923	2,283,749	133,978	841,321	10.673	<0.001
	ACAFLKS 1: sample (n = 767)		**ACAFLKS 0: sample (n = 3,054)**			
AF	536,793	1,434,269	150,664	659,903	10.961	<0.001
APNAS	416,001	1,233,207	122,972	819,293	7.908	<0.001
TOTAL	952,794	2,502,258	273,636	1,413,269	9.956	<0.001
	ACAPLKS 1: sample (n = 258)		**ACAPLKS 0: sample (n = 3,563)**			
AF	175,862	530,068	231,960	905,980	-0.982	0.326
APNAS	134,272	339,532	185,234	953,232	-0.855	0.393
TOTAL	310,134	770,322	417,194	1,759,031	-0.971	0.332

a. Variable has the value 1 if there is interlocking, 0 otherwise. This analysis separates the sample into interlockings and non–interlockings ignoring the number of interlocks.

b. AF = audit fees; APNAS = auditor provided non–audit services fees; TOTAL = total of audit and APNAS fees; other variables have been defined in Table 5.1.

than those of non–interlocking companies. This may be due to the fact that firms with DAPLKS are of smaller size. The more companies the audit partner audits, the smaller the companies probably are, so that would explain the lower audit and APNAS fees.

The average audit fees and APNAS fees were significantly different between ACLKS and non–interlocking companies as well as ACAFLKS and non–interlocking companies ($p < 0.001$). The average audit fees ($393,295) and APNAS fees ($323,628) of ACLKS companies were significantly higher than those of non–interlocking companies ($79,710 and $54,268 respectively). The average audit fees and APNAS fees were also higher for ACAFLKS companies ($536,793 and $416,001 respectively) than non–interlocking ($150,664 and $122,972 respectively) companies. This result indicates that both audit and APNAS fees were higher for ACLKS and ACAFLKS companies than non–interlocking companies. The average audit fees and APNAS fees of ACAPLKS companies were not significantly different from those of non–interlocking companies. The average audit fees and APNAS fees was lower for ACAPLKS companies ($175,862 and $134,272 respectively) than those of non–interlocking ($231,960 and $185,234 respectively) companies. The lower audit and APNAS fees could be for the same reason as given in respect of DAPLKS.

The average TOTAL fees were significantly different for interlocking companies (other than ACAPLKS) compared with non–interlocking companies. The average TOTAL fees were higher for DLKS, DAFLKS, ACLKS and ACAFLKS than non–interlocking companies. However, the average TOTAL fees for DAPLKS and ACAPLKS were lower than for non–interlocking companies.

5.1.1.3 Correlations

Table 5.3 reports Pearson correlation coefficients between LnAPNAS and the hypotheses and control variables included in the APNAS fee model. As expected (p-values are two-tailed), the LnAPNAS fee is significantly correlated with all interlocking variables (other than ACAPLKS). LnAPNAS fee is significantly and positively associated with DLKS ($p < 0.001$) and DAFLKS ($p < 0.001$). The results indicate that APNAS fees are positively associated with the number of links between directors, and director and an audit firm in other companies. The correlation coefficient of LnAPNAS fees and DAPLKS is significant and negative ($p < 0.001$). This result indicates that APNAS fees are negatively associated with the number of links between director and audit partner in other companies.

The test variables relating to audit committee member and audit firm/partner interlocking are also significantly correlated with APNAS fees. The relationships between ACLKS ($p < 0.001$), ACAFLKS ($p < 0.001$) and LnAPNAS fees are positive and significant. Results indicate that APNAS fees are positively associated with the number of links between audit committee members, and an audit committee member and audit firm in other companies. The correlation coefficient between LnAPNAS fees and ACAPLKS is not significant ($p = 0.325$). This result indicates that APNAS fees are not associated with the number of audit committee members and audit partner links in other companies.

As expected, entity size (LnTA) and auditor type (BIG 4) are positive and significantly associated with LnAPNAS fees ($p < 0.001$ and $p < 0.001$ respectively), indicating that larger companies and companies audited by the BIG 4 audit firms purchase more APNAS. The ROA is also positive and significant ($p < 0.001$) indicating

Table 5.3
Correlation matrix for the LnAPNAS model (N = 3,821)

Variables	LnAPNAS	DLKS	DAFLKS	DAPLKS	ACLKS	ACAFLKS	ACAPLKS	LnTA	BIG4	LEVERAGE
LnAPNAS	1.000									
DLKS	0.218 (<0.001)	1.000								
DAFLKS	0.162 (<0.001)	0.617 (<0.001)	1.000							
DAPLKS	-0.081 (<0.001)	0.225 (<0.001)	0.550 (<0.001)	1.000						
ACLKS	0.281 (<0.001)	0.607 (<0.001)	0.413 (<0.001)	0.057 (<0.001)	1.000					
ACAFLKS	0.175 (<0.001)	0.389 (<0.001)	0.613 (<0.001)	0.244 (<0.001)	0.633 (<0.001)	1.000				
ACAPLKS	-0.016 (0.325)	0.120 (<0.001)	0.313 (<0.001)	0.494 (<0.001)	0.261 (<0.001)	0.561 (<0.001)	1.000			
LnTA	0.509 (<0.001)	0.386 (<0.001)	0.320 (<0.001)	-0.036 (0.026)	0.495 (<0.001)	0.359 (<0.001)	0.099 (<0.001)	1.000		
BIG4	0.292 (<0.001)	0.209 (<0.001)	0.275 (<0.001)	-0.039 (0.017)	0.239 (<0.001)	0.253 (<0.001)	0.053 (0.001)	0.412 (<0.001)	1.000	
LEVERAGE	-0.015 (0.364)	0.049 (0.003)	0.032 (0.050)	0.031 (0.057)	-0.020 (0.206)	-0.010 (0.552)	-0.002 (0.878)	-0.108 (<0.001)	0.023 (0.152)	1.000
EQUITY	0.036 (0.028)	0.092 (<0.001)	0.031 (0.056)	0.005 (0.759)	0.042 (0.009)	0.017 (0.280)	0.006 (0.696)	0.029 (0.077)	-0.009 (0.571)	-0.037 (0.023)
ROA	0.133 (<0.001)	0.063 (<0.001)	0.043 (0.007)	-0.060 (<0.001)	0.142 (<0.001)	0.088 (<0.001)	0.021 (0.195)	0.343 (<0.001)	0.110 (<0.001)	-0.083 (<0.001)
NEG_ROA	-0.335 (<0.001)	-0.160 (<0.001)	-0.137 (<0.001)	0.063 (<0.001)	-0.320 (<0.001)	-0.217 (<0.001)	-0.057 (<0.001)	-0.612 (<0.001)	-0.239 (<0.001)	0.031 (0.052)
INITIAL	-0.087 (<0.001)	-0.040 (0.013)	-0.038 (0.018)	-0.003 (0.829)	-0.035 (0.031)	-0.042 (0.009)	-0.001 (0.943)	-0.087 (<0.001)	-0.152 (<0.001)	0.015 (0.366)
MERACQS	0.129 (<0.001)	0.154 (<0.001)	0.101 (<0.001)	-0.031 (0.054)	0.199 (<0.001)	0.113 (<0.001)	0.015 (0.368)	0.263 (<0.001)	0.107 (<0.001)	-0.012 (0.462)
MB	0.041 (0.011)	-0.006 (0.723)	-0.006 (0.719)	-0.010 (0.529)	0.019 (0.252)	0.010 (0.522)	0.006 (0.710)	0.060 (<0.001)	0.027 (0.094)	-0.003 (0.866)
BDINDP	0.078 (<0.001)	0.106 (<0.001)	0.052 (0.001)	-0.047 (0.003)	0.117 (<0.001)	0.064 (<0.001)	-0.004 (0.809)	0.106 (<0.001)	0.095 (<0.001)	0.006 (0.711)
ACSIZE	0.373 (<0.001)	0.204 (<0.001)	0.152 (<0.001)	-0.105 (<0.001)	0.471 (<0.001)	0.315 (<0.001)	0.126 (<0.001)	0.504 (<0.001)	0.237 (<0.001)	-0.041 (0.012)
INDEPAC	0.306 (<0.001)	0.212 (<0.001)	0.134 (<0.001)	-0.069 (<0.001)	0.356 (<0.001)	0.212 (<0.001)	0.058 (<0.001)	0.409 (<0.001)	0.200 (<0.001)	-0.036 (0.026)

Table 5.3 (Contd.)

Variables	EQUITY	ROA	NEG_ROA	INITIAL	MERACQS	MB	BDINDP	ACSIZE	INDEPAC
EQUITY	1.000								
ROA	-0.062 (<0.001)	1.000							
NEG_ROA	0.120 (<0.001)	-0.379 (<0.001)	1.000						
INITIAL	0.005 (0.774)	-0.061 (<0.001)	0.061 (<0.001)	1.000					
MERACQS	0.094 (<0.001)	0.061 (<0.001)	-0.157 (<0.001)	-0.022 (0.169)	1.000				
MB	-0.012 (0.441)	0.084 (<0.001)	-0.019 (0.233)	0.016 (0.333)	0.009 (0.574)	1.000			
BDINDP	0.007 (0.664)	0.039 (0.015)	-0.065 (<0.001)	-0.057 (<0.001)	0.047 (0.004)	-0.004 (0.794)	1.000		
ACSIZE	0.016 (0.315)	0.170 (<0.001)	-0.364 (<0.001)	-0.030 (0.062)	0.118 (<0.001)	0.033 (0.044)	0.159 (<0.001)	1.000	
INDEPAC	0.034 (0.035)	0.123 (<0.001)	-0.285 (<0.001)	-0.032 (0.051)	0.099 (<0.001)	0.023 (0.157)	0.260 (<0.001)	0.521 (<0.001)	1.000

a. Two-tailed p values are presented in parentheses.
b. Variables have been defined in Table 5.1.

that profitable companies may purchase more APNAS than non–profitable companies, which is supported by a significant ($p < 0.001$) negative association between NEG_ROA and LnAPNAS fees. That companies issuing new equity (EQUITY) and undergoing mergers/acquisitions during the year require extra non–audit services is supported by the fact that there are significant positive associations between EQUITY, MERACQS ($p = 0.028$ and $p < 0.001$) and APNAS fees. There is a significant ($p = 0.011$) positive association between LnAPNAS fee and MB. Companies that are either in the first or second year with their auditor purchase less APNAS, which is supported by a significant negative correlation coefficient ($p < 0.001$) between INITIAL and LnAPNAS fees. The correlation coefficients of BDINDP ($p < 0.001$), ACSIZE ($p < 0.001$) and INDEPAC ($p < 0.001$) are significantly and positively associated with APNAS fees. The correlation between LEVERAGE and LnAPNAS fees is not significant ($p = 0.364$) indicating that APNAS fees are not univariately associated with leverage.

5.1.1.4 Multivariate results

Table 5.4 reports the OLS regression results using the dependent variable LnAPNAS fees after controlling for factors that may affect APNAS fees.[53] All the hypotheses in this section are non–directional (p-values are two-tailed) due to competing arguments with respect to association between APNAS fees and interlockings. Overall, the model is significant ($p < 0.001$) and the adjusted R^2s range from 0.317 to 0.321.[54] Four of the six test variables are significant (Eq. 1).

[53] The LnAPNAS fees models are estimated separately for each of the test variables because the interlocking variables are highly correlated with each other. Doing this, avoids the impact of multicollinearity on the regression results.

[54] The relatively low adjusted R^2 of the LnAPNAS fees model is partially due to inclusion of 883 companies that did not purchase non–audit services from their incumbent auditors. The LnAPNAS fee model (Equation 1) was run separately, after excluding observations that did not have APNAS fees. The adjusted R^2 for that model is 0.561. Other APNAS fees studies report similar adjusted R^2s, for example, Ashbaugh *et al.* (2003) reports an adjusted R^2 for their APNAS fee model of 0.340.

Hypothesis 1a

DLKS is significantly and positively (p = 0.027) associated with LnAPNAS fee, supporting hypothesis 1a, which posits an association between director interlocking and APNAS fees. The result indicates that APNAS fees are positively associated with the number of DLKS links. Interlocking directors may offer higher APNAS fees to pressure the auditor to act in their companies' favour. Auditors of director linked companies may be motivated to act in favour of directors to secure the future APNAS fees from a family of linked companies. Therefore, a significant positive association between the number of DLKS and APNAS fees may be an indication of impaired auditor independence.

Hypothesis 1b

The coefficient of DAFLKS is not significant (p = 0.494), rejecting hypothesis 1b, which is the posited association between director–auditor interlocking and APNAS fees. An insignificant association between the number of DAFLKS and APNAS fees does not provide evidence of impaired auditor independence. Jubb (2000) argues that directors and auditors value personal contact in auditor–client relationships but are aware of the potential damage from such interpersonal associations, which may affect auditor independence in either fact or appearance.

Hypothesis 1c

The coefficient of DAPLKS is negative and significant (p = 0.017), supporting hypothesis 1c, which posits an association between director–audit partner interlocking and APNAS fees. The result indicates that the number of DAPLKS is weakly negatively associated with APNAS fees. A negative significant association may indicate the benefits of knowledge–spillovers due to the joint provision of audit and APNAS, which may not impair auditor independence.

Table 5.4
Regression results for LnAPNAS fee as the dependent variable

(LnAPNAS = $\beta_0 + \beta_1$INTERLOCKINGS + β_2LnTA + β_3BIG4 + β_4EQUITY + β_5MERACQS + β_6ROA + β_7LEVERAGE + β_8NEG_ROA + β_9MB + β_{10}INITIAL + β_{11}BDINDP + β_{12}ACSIZE + β_{13}INDEPAC + β_{14}YEAR$_{03\text{-}05}$ + $\beta_{15}\Sigma$INDUSTRY +ε)

Variables	H1a		H1b		H1c		H1d		H1e		H1f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-5.781	<0.001	-6.127	<0.001	-6.232	<0.001	-6.282	<0.001	-6.513	<0.001	-6.312	<0.001
DLKS	0.041	0.027										
DAFLKS			0.035	0.494								
DAPLKS					-0.401	0.017						
ACLKS							-0.015	0.731				
ACAFLKS									-0.216	0.031		
ACAPLKS											-0.847	<0.001
LnTA	0.775	<0.001	0.796	<0.001	0.804	<0.001	0.805	<0.001	0.815	<0.001	0.806	<0.001
LEVERAGE	0.010	0.013	0.010	0.008	0.011	0.006	0.011	0.007	0.011	0.006	0.011	0.006
EQUITY	0.423	0.003	0.441	0.002	0.442	0.002	0.443	0.002	0.443	0.002	0.450	0.002
ROA	-0.260	0.023	-0.268	0.019	-0.281	0.014	-0.274	0.017	-0.282	0.014	-0.283	0.013
NEG_ROA	-0.079	0.657	-0.061	0.734	-0.047	0.790	-0.056	0.752	-0.055	0.759	-0.041	0.817
MB	0.000	0.313	0.000	0.335	0.000	0.342	0.000	0.344	0.000	0.352	0.000	0.329
MERACQS	-0.110	0.555	-0.089	0.632	-0.091	0.623	-0.081	0.663	-0.077	0.678	-0.093	0.614
BIG4	0.709	<0.001	0.706	<0.001	0.717	<0.001	0.724	<0.001	0.759	<0.001	0.732	<0.001
INITIAL	-0.590	<0.001	-0.591	<0.001	-0.590	<0.001	-0.588	<0.001	-0.587	<0.001	-0.583	<0.001
BDINDP	-0.218	0.290	-0.192	0.351	-0.196	0.342	-0.188	0.361	-0.188	0.360	-0.206	0.316
ACSIZE	0.241	<0.001	0.241	<0.001	0.239	<0.001	0.246	<0.001	0.260	<0.001	0.270	<0.001
INDEPAC	0.531	0.001	0.549	<0.001	0.549	<0.001	0.554	<0.001	0.553	<0.001	0.544	<0.001
$YEAR_1$	0.348	0.027	0.370	0.018	0.373	0.018	0.372	0.018	0.364	0.021	0.357	0.023
$YEAR_2$	0.179	0.257	0.189	0.233	0.186	0.239	0.188	0.234	0.187	0.238	0.170	0.280
n		3,821		3,821		3,821		3,821		3,821		3,821
Adjusted R^2		0.318		0.317		0.318		0.317		0.318		0.321

a. P-values of the estimated parameters are reported as two-tailed.

b. The results of dummy variables ΣINDUSTRY have not been reported in this table. Six of the 25 industry dummy variables (IND1010 - Energy; IND2510 – Automobile and Components; IND2550 - Retailing; IND3010 – Food and Stables Retailing; IND3510 – Health Care Equipment and Services; IND5010 – Telecommunication Services) are significant.

LnAPNAS = natural log of auditor provided non–audit services fees; INTERLOCKINGS = interlockings include DLKS, DAFLKS, DAPLKS, ACLKS, ACAFLKS, ACAPLKS and are used separately in estimating the model; LnTA = natural log of total assets; BIG 4 = 1 if company's incumbent auditor is a BIG 4 audit firm, 0 otherwise; EQUITY = 1 if the company issues any new equity during the year, 0 otherwise; MERACQS = 1 if the firm was engaged in a merger/acquisition activity during the current year, 0 otherwise; ROA = operating income divided by average total assets; LEVERAGE = ratio of total liabilities to total assets; NEG_ROA = 1 if the firm reports negative return on assets in the current year, 0 otherwise; MB = market–to–book ratio at fiscal–year–end; INITIAL = 1 if the audit firm engagement is either in the first or second year with the current auditee, 0 otherwise; BDINDP = 1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; ACSIZE = number of audit committee members; INDEPAC = 1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; $YEAR_{03\text{-}05}$ = two dummy variables for years; ∑INDUSTRY = 1 if the nominated industry group, 0 otherwise, and there are 25 dummy variables for 26 GICS.

Hypothesis 1d

The regression result shows that the coefficient of ACLKS is insignificant (p = 0.731), rejecting hypothesis 1d, which posits an association between audit committee member interlocking and APNAS fees. The result supports the argument that audit committees may control the purchase of APNAS from the incumbent auditors.

Hypothesis 1e

The coefficient of ACAFLKS is significantly and negatively associated with AFTENURE (p = 0.031), supporting hypothesis 1e, which posits an association between audit committee member–audit firm interlocking and APNAS fees. Given the regulatory encouragement for non–executive domination of audit committees and the responsibilities of audit committees for the selection, fee determination and supervision of the external auditors, this may discourage them from purchasing expensive APNAS or paying higher APNAS fees due to independence issues. This result does not provide evidence consistent with impaired auditor independence.

Hypothesis 1f

ACAPLKS is negative and significant (p < 0.001), supporting hypothesis 1f, which posits an association between audit committee member–audit partner interlocking and APNAS fees. The findings indicate that the relationship between an audit committee member and audit partner in linked companies may motivate them to emphasise their independent monitoring roles to improve perceptions of auditor independence and may limit the purchase of non–audit services from incumbent auditors or this could be discounted fees. Additionally, due to the independent monitoring roles, audit committees should consider whether the compensation of the

individuals employed by the external auditor who are performing the audit of the company:

> "is tied to the provision of non–audit services and, if so, consider whether this impairs or appears to impair the external auditor's judgment or independence in respect of the company" (Ramsay Report, 2001, p. 17).

The result does not support impairment of auditor independence.

Control variables

Most of the control variables are significant (two-tailed p-values). That large companies purchase more APNAS is supported by a significant and positive association ($p < 0.001$) between LnTA and LnAPNAS fees. A significant positive ($p < 0.001$) association between BIG 4 and APNAS fees indicates that large audit firms (BIG 4) either charge higher APNAS fees or provide more such services to their clients. A positive significant ($p = 0.003$) association between EQUITY and LnAPNAS fee indicates that companies which issue new equity for financing purchase more non–audit services from their auditors. LEVERAGE is also positive and significant ($p = 0.013$) indicating that an auditor of a risky company charges higher APNAS fees or provides more such services. ROA is negative and significant ($p = 0.023$) suggesting that more profitable companies purchase less APNAS. A negative and significant ($p < 0.001$) association between INITIAL and LnAPNAS fee indicates that auditors provide lower APNAS in the first or second year of an audit engagement. Audit committee size (ACSIZE) and a majority of the audit committee members as non-executive are significantly and positively associated ($p < 0.001$ and $p = 0.001$) with APNAS fees. $YEAR_1$ (2003) is significant and positive ($p = 0.027$) with APNAS fees. Out of 25 industry dummy variables, IND1010 - Energy; IND2510 – Automobile and Components; IND2550 - Retailing; IND3010 – Food and Stables Retailing; IND3510 –

Health Care Equipment and Services; IND5010 – Telecommunication Services are significantly associated with APNAS fees. The control variables NEG_ROA (p = 0.657), MB (p = 0.313), MERACQS (p = 0.555) and BDINDP (p = 0.290) are not significant.

5.1.1.5 Sensitivity analyses

Petersen (2007) argues that when the residuals are correlated across observations in panel data sets, OLS standard errors could be biased and the true variability of the coefficient estimates could be over or underestimated. This can occur because the residuals of a given firm may be correlated across years for a given firm (firm effect) or the residuals of a given year may be correlated across different firms (time effect) (Petersen, 2007). Petersen (2007) argues that among the other techniques (Newey–West standard errors, the Fama–MacBeth standard errors) clustered standard errors are unbiased as they account for the residual dependence created by the firm effect as well as a time effect. To overcome these issues, Petersen (2007) suggests that:

> "since many panel data sets have more firms than years, a common approach is to include dummy variables for each time period (to absorb the time effect) and then cluster by firm" (Petersen, 2007, p. 24.).

(see also, Gross and Souleles, 2002; Lamont and Polk, 2002; Anderson and Reeb, 2004; Sapienza, 2004; Faulkender and Petersen, 2006). The APNAS fees for the same firm across the year may be highly correlated. Thus, the OLS regression was re-run after clustering observations and including year dummies to address the above issues. The results show that adjusted R^2s range from 0.315 to 0.317. The test variables DLKS (p = 0.032), DAPLKS (p = 0.017) ACAFLKS (p = 0.022) and ACAPLKS (p < 0.001) remained significant in the same directions as before (Appendix II, Table 1, Panel A).

The result of associations between interlockings and APNAS are not biased by firm effect or time effect.

Prior research indicates that the strength of the economic bonding between the audit firm and its clients affects auditor independence (e.g., DeAngelo, 1981a; Beck *et al.,* 1988; Magee and Tseng, 1990). Ashbaugh *et al.* (2003) argues that the fee ratio captures the relative monetary value of the audit versus APNAS to a client, which may have an impact on perceptions of auditor independence. There are also concerns that auditors may compromise their independence by allowing high fee clients more financial statement discretion relative to low fee clients (Ashbaugh *et al.,* 2003). Ruddock and Taylor (2005) argues that an auditor would be more concerned with avoiding the loss of audit clients to whom a large amount of APNAS fees relative to audit fees are sold.

The Securities and Exchange Commission (SEC, 2000a, 2000b) and most prior studies (e.g., DeFond *et al.,* 2002; Ashbaugh *et al.,* 2003; Whisenant *et al.,* 2003; Ruddock and Taylor, 2005) focus on the relative magnitude of APNAS fees, typically computed as APNAS fees divided by total fees, where fees is equal to the sum of the total audit and APNAS fees (FEERATIO). Equation 1 was re-run using APNAS fees to the total of APNAS and audit fees (FEERATIO).The results show that DLKS ($p = 0.086$) is weakly significant and positive and ACAPLKS ($p = 0.026$) is significantly and negatively associated with FEERATIO. Test variables DAPLKS ($p = 0.357$) and ACAFLKS ($p = 0.347$) became insignificant (Appendix II, Table 1, Panel B), which were significant in the original analysis (Equation 1). The results are inconsistent with the original analysis (Equation 1).

There are studies (e.g., Abbott *et al.* 2003; Whisenant *et al.,* 2003) which exclude financial institutions when explaining variation in APNAS fees and argue that the inclusion of financial institutions reduces the comparability of included financial statement data. Equation 1 was re-run excluding 665 observations pertaining to the financial sector (GICS code 4010 to 4040). The results (n = 3,156) show that DAFLKS (p = 0.063) and ACAFLKS (p = 0.022) are significantly (albeit weakly for the former) and positively associated with APNAS fees (Appendix II, Table 1, Panel C). Test variables DAPLKS (p = 0.943) and ACAPLKS (p = 0.150) became insignificant, which were significant in the original analysis (Equation 1). The results are inconsistent with the original analysis (Equation 1).

Firms without audit committees are likely to have different characteristics so the inclusion of these firms in the analyses may expose the study to self-selection bias. Equation 1 was re-run excluding 1,042 observations which did not have audit committees. The results (n = 2,779) show that DLKS (p = 0.023) is significantly and positively associated with APNAS fees. DAPLKS (p = 0.002), ACAFLKS (p = 0.020) and ACAPLKS (p < 0.001) are significantly and negatively associated with APNAS fees (Appendix II, Table 1, Panel D). The results are consistent with the original analysis (Equation 1).

5.1.2 AUDITOR FIRM TENURE

Audit firm tenure (AFTENURE) is the dependent variable to examine whether interlockings are associated with audit firm tenure. AFTENURE is a continuous measure of the number of uninterrupted years of relationship between the auditor and the current auditee. The following sections provide descriptive statistics for the AFTENURE model:

5.1.2.1 Descriptive statistics

Table 5.5 reports the descriptive statistics for the AFTENURE model. Descriptive statistics show that the average audit firm tenure for the sample companies was 7.57 years and the average audit partner tenure was 3.51 years. More than 57 per cent of the sample companies were audited by BIG 4 audit firms. The average listing age of the companies was 13.51 years. The PQUAL variable shows that, on average, 17 per cent of the companies were issued other than an unqualified opinion in the prior year.

Table 5.5
Descriptive statistics for the AFTENURE model (N = 3,821)

Variables	Mean	Median	Std. Deviation
AFTENURE	7.57	5.00	7.12
APTENURE	3.51	3.00	2.95
Total Assets ($M)	1,684.00	22.00	17,818.00
G_TA	1.07	0.07	12.91
LEVERAGE	0.43	0.33	0.67
LOSS	0.58	1.00	0.49
AGE	13.51	11.00	10.96
BIG4	0.57	1.00	0.50
PQUAL	0.17	0.00	0.38
AA	0.05	0.00	0.23
UXAF	0.00	0.00	0.71
UXAPNAS	0.00	1.24	3.90
BDINDP	0.68	0.71	0.19
ACSIZE	2.99	3.00	1.00
INDEPAC	0.73	1.00	0.44

AGE = age of the company as measured as the number of years the company has been listed on ASX; PQUAL =1 if the company has other than an unqualified opinion in the previous year, 0 otherwise; UXAF = unexpected audit fees; UXAPNAS = unexpected auditor provided non–audit fees; LOSS = 1 if the company reported a loss either in the current or previous year, 0 otherwise; AA = 1 if the auditor was Arthur Andersen during 2001, 0 otherwise. Other variables have been defined earlier in Tables 5.1 and 5.4.

5.1.2.2 Comparison of audit firm tenure between interlocking and non–interlocking companies

Table 5.6 shows the mean audit firm tenure for interlocking and non–interlocking companies. The average audit firm tenure was longer for DLKS, DAFLKS

and DAPLKS compared to that of non–interlocking companies. The average audit firm tenure between DLKS and DAFLKS was significantly different from non–interlocking companies ($p = 0.001$ and $p < 0.001$ respectively) However, the average audit firm tenure between DAPLKS and non–interlocking companies was not significantly different ($p = 0.628$).

The average audit firm tenure for ACLKS and ACAFLKS companies was significantly different from that of non–interlocking companies ($p = 0.006$ and $p < 0.001$

Table 5.6
Audit firm tenure for interlocking and non–interlocking companies

Test Variables	Interlocking			Non–interlocking			t	p-value Sig. (two-tailed)
	n	Mean	Std. Deviation	N	Mean	Std. Deviation		
DLKS	3,251	7.73	7.274	570	6.65	6.060	3.344	0.001
DAFLKS	1,672	8.27	8.105	2,149	7.02	6.185	5.411	<0.001
DAPLKS	765	7.68	7.799	3,056	7.54	6.935	0.485	0.628
ACLKS	1,809	7.90	7.484	2,012	7.27	6.756	2.734	0.006
ACAFLKS	767	8.52	8.118	3,054	7.33	6.822	4.154	<0.001
ACAPLKS	258	7.38	7.243	3,563	7.58	7.107	-0.434	0.664

Variables have been defined earlier in Table 5.1.

respectively). The average audit firm tenure was longer for the interlocking companies compared to non–interlocking companies. However, the average audit firm tenure between ACAPLKS and non–interlocking companies was not significantly different ($p = 0.664$).

5.1.2.3 Correlations

Table 5.7 provides Pearson's correlation coefficients for the test variables included in the AFTENURE model and other control variables. The results show that four of the six interlocking variables are positive and significantly (p-values are two-tailed) correlated with audit firm tenure (DAPLKS and ACAPLKS are not significant). The correlation coefficients between DLKS, DAFLKS and AFTENURE are positive

Table 5.7
Correlation matrix for AFTENURE as the dependent variable (N = 3,821)

Variables	AFTENURE	DLKS	DAFLKS	DAPLKS	ACLKS	ACAFLKS	ACAPLKS	LnTA	G_TA	LEVERAGE
AFTENURE	1.000									
DLKS	0.087 (<0.001)	1.000								
DAFLKS	0.116 (<0.001)	0.617 (<0.001)	1.000							
DAPLKS	0.014 (0.374)	0.225 (<0.001)	0.550 (<0.001)	1.000						
ACLKS	0.067 (<0.001)	0.607 (<0.001)	0.413 (<0.001)	0.057 (<0.001)	1.000					
ACAFLKS	0.076 (<0.001)	0.389 (<0.001)	0.613 (<0.001)	0.244 (<0.001)	0.633 (<0.001)	1.000				
ACAPLKS	-0.005 (0.765)	0.120 (<0.001)	0.313 (<0.001)	0.494 (<0.001)	0.261 (<0.001)	0.561 (<0.001)	1.000			
LnTA	0.173 (<0.001)	0.386 (<0.001)	0.320 (<0.001)	-0.036 (0.026)	0.495 (<0.001)	0.359 (<0.001)	0.099 (<0.001)	1.000		
G_TA	-0.027 (0.100)	0.020 (0.227)	0.024 (0.138)	0.016 (0.332)	-0.013 (0.412)	-0.012 (0.457)	0.004 (0.784)	-0.014 (0.385)	1.000	
LEVERAGE	-0.002 (0.915)	0.049 (0.003)	0.032 (0.050)	0.031 (0.057)	-0.020 (0.206)	-0.010 (0.552)	-0.002 (0.878)	-0.108 (<0.001)	-0.006 (0.718)	1.000
LOSS	-0.121 (<0.001)	-0.168 (<0.001)	-0.147 (<0.001)	0.043 (0.008)	-0.300 (<0.001)	-0.197 (<0.001)	-0.065 (<0.001)	-0.589 (<0.001)	0.022 (0.169)	0.030 (0.063)
LnAGE	0.509 (<0.001)	0.082 (<0.001)	0.059 (<0.001)	0.010 (0.524)	0.056 (<0.001)	0.017 (0.282)	-0.015 (0.342)	0.125 (<0.001)	0.000 (0.986)	0.017 (0.285)
BIG4	0.188 (<0.001)	0.209 (<0.001)	0.275 (<0.001)	-0.039 (0.017)	0.239 (<0.001)	0.253 (<0.001)	0.053 (0.001)	0.412 (<0.001)	-0.005 (0.742)	0.023 (0.152)
PQUAL	-0.042 (0.010)	-0.128 (<0.001)	-0.124 (<0.001)	-0.028 (0.079)	-0.165 (<0.001)	-0.114 (<0.001)	-0.020 (0.217)	-0.326 (<0.001)	0.039 (0.017)	0.010 (0.557)
AA	-0.163 (<0.001)	0.034 (0.035)	0.060 (<0.001)	-0.012 (0.442)	0.036 (0.025)	0.032 (0.048)	-0.002 (0.901)	0.098 (<0.001)	-0.007 (0.648)	0.002 (0.918)
UXAF	0.054 (0.001)	0.062 (<0.001)	-0.016 (0.310)	-0.145 (<0.001)	0.088 (<0.001)	0.006 (0.688)	-0.106 (<0.001)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
UXAPNAS	-0.011 (0.487)	0.028 (0.086)	0.000 (0.976)	-0.038 (0.020)	0.022 (0.168)	-0.018 (0.259)	-0.062 (<0.001)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
BDINDP	0.034 (0.037)	0.106 (<0.001)	0.052 (0.001)	-0.047 (0.003)	0.117 (<0.001)	0.064 (<0.001)	-0.004 (0.809)	0.106 (<0.001)	0.008 (0.605)	0.006 (0.711)
ACSIZE	0.052 (0.001)	0.204 (<0.001)	0.152 (<0.001)	-0.105 (<0.001)	0.471 (<0.001)	0.315 (<0.001)	0.126 (<0.001)	0.504 (<0.001)	-0.008 (0.608)	-0.041 (0.012)
INDEPAC	0.041 (0.012)	0.212 (<0.001)	0.134 (<0.001)	-0.069 (<0.001)	0.356 (<0.001)	0.212 (<0.001)	0.058 (<0.001)	0.409 (<0.001)	-0.016 (0.309)	-0.036 (0.026)

Table 5.7 (Contd.)

Variables	LOSS	LnAGE	BIG4	PQUAL	AA	UXAF	UXAPNAS	BDINDP	ACSIZE	INDEPAC
LOSS	1.000									
LnAGE	-0.083 (<0.001)	1.000								
BIG4	-0.240 (<0.001)	0.066 (<0.001)	1.000							
PQUAL	0.298 (<0.001)	0.073 (<0.001)	-0.210 (<0.001)	1.000						
AA	-0.069 (<0.001)	0.053 (0.001)	0.146 (<0.001)	0.013 (0.416)	1.000					
UXAF	0.012 (0.458)	0.067 (<0.001)	0.000 (1.000)	0.108 (<0.001)	0.030 (0.062)	1.000				
UXAPNAS	-0.001 (0.953)	-0.059 (<0.001)	0.000 (1.000)	0.008 (0.626)	-0.014 (0.393)	0.257 (<0.001)	1.000			
BDINDP	-0.056 (0.001)	0.030 (0.060)	0.095 (<0.001)	-0.042 (0.010)	0.017 (0.284)	0.054 (0.001)	0.018 (0.275)	1.000		
ACSIZE	-0.333 (<0.001)	0.018 (0.269)	0.237 (<0.001)	-0.166 (<0.001)	0.062 (<0.001)	0.159 (<0.001)	0.095 (<0.001)	0.159 (<0.001)	1.000	
INDEPAC	-0.265 (<0.001)	-0.003 (0.837)	0.200 (<0.001)	-0.157 (<0.001)	0.023 (0.159)	0.088 (<0.001)	0.092 (<0.001)	0.260 (<0.001)	0.521 (<0.001)	1.000

a. Two-tailed p values are presented in parentheses.
b. Variables have been defined in Tables 5.1 and 5.5.

and significant ($p < 0.001$ and $p < 0.001$ respectively). ACLKS and ACAFLKS are also significant ($p < 0.001$ and $p < 0.001$ respectively) and positively associated with AFTENURE. A significant positive correlation between the test variables and audit firm tenure indicates that the number of interlocking links is significantly associated with longer audit firm tenure. There are insignificant correlations between DAPLKS ($p = 0.374$), ACAPLKS ($p = 0.765$) and AFTENURE. These indicate that audit firm tenure may not be affected by the number of audit partner links with either director or audit committee members in other companies.

Most of the control variables are significantly correlated with AFTENURE. A significant positive association between the entity size (LnTA) ($p < 0.001$), company age (LnAGE) ($p < 0.001$) and AFTENURE indicates that audit firm tenure is longer for large companies and companies listed on the ASX for longer periods. A significant and positive association between AFTENURE and BIG 4 indicates that audit firm tenure is longer if the entities are audited by BIG 4 audit firms ($p < 0.001$). A significant negative ($p < 0.001$) association between AFTENURE and LOSS indicates that audit firm tenure is shorter if entities incur losses. UXAF is positive and highly correlated ($p = 0.001$) with AFTENURE indicating that audit firms have higher unexpected audit fees for companies with longer tenure. There is a significant ($p < 0.001$) negative association between AFTENURE and AA. PQUAL is significantly and negatively ($p = 0.010$) associated with AFTENURE. BDINDP ($p = 0.037$), ACSIZE ($p = 0.001$) and INDEPAC ($p = 0.012$) are significantly and positively correlated with AFTENURE. The control variables G_TA ($p = 0.100$) and LEVERAGE ($p = 0.915$) and UXAPNAS ($p = 0.487$) are not significantly correlated with AFTENURE.

5.1.2.4 Multivariate statistics

AFTENURE is the dependent variable for the audit firm tenure model. Table 5.8 reports the regression results for the AFTENURE model. The model is significant ($p < 0.001$) with adjusted R^2s of 0.33.[55] All the hypotheses relating to this model are non–directional (p-values are two-tailed) due to competing arguments in respect of associations between AFTENURE and interlockings.

Hypothesis 2a

DLKS is not significant ($p = 0.696$), rejecting hypothesis 2a, which posits an association between director interlocking and audit firm tenure. This result indicates that the number of director links is not associated with audit firm engagement tenure in linked companies. The issue of auditor independence with longer audit firm tenure in the director interlocking situation appears not to be an issue based on this finding.

Hypothesis 2b

DAFLKS is significant and positive ($p = 0.003$), supporting hypothesis 2b, which posits an association between director–audit firm interlocking and audit firm tenure. A significant positive association between the number of director–audit firm links and audit firm tenure would raise concerns with respect to perceptions of auditor independence (Courtney and Jubb, 2005). Thus, the finding may provide evidence of impaired auditor independence.

Hypothesis 2c

DAPLKS is not significant ($p = 0.171$), rejecting hypothesis 2c, which is the posited association between director–audit partner interlocking and audit firm tenure.

[55] Courtney and Jubb (2005) reports an adjusted R^2 of 0.4316 for their auditor tenure model.

Table 5.8
Regression results for AFTENURE as the dependent variable

(AFTENURE = $\alpha + \beta_1$INTERLOCKINGS $+\beta_2$UXAF $+\beta_3$LEVERAGE $+\beta_4$PQUAL $+\beta_5$LnTA $+\beta_6$BIG4 $+\beta_7$LnAGE $+\beta_8$G_TA $+\beta_9$LOSS $+\beta_{10}$UXAPNAS $+\beta_{11}$AA $+\beta_{12}$BDINDP $+\beta_{13}$ACSIZE $+\beta_{14}$INDEPAC $+\beta_{15}YEAR_{03\text{-}05} + \varepsilon$)

Variables	H2a		H2b		H2c		H2d		H2e		H2f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-6.065	<0.001	-5.414	<0.001	-6.007	<0.001	-6.404	<0.001	-5.765	<0.001	-5.971	<0.001
DLKS	-0.011	0.696										
DAFLKS			0.220	0.003								
DAPLKS					0.175	0.171						
ACLKS							-0.115	0.065				
ACAFLKS									0.178	0.227		
ACAPLKS											-0.126	0.648
UXAF	0.321	0.023	0.325	0.021	0.342	0.016	0.332	0.019	0.320	0.023	0.311	0.029
LEVERAGE	-0.003	0.575	-0.005	0.436	-0.004	0.520	-0.003	0.589	-0.004	0.529	-0.003	0.550
PQUAL	-0.460	0.091	-0.444	0.102	-0.444	0.102	-0.459	0.091	-0.464	0.088	-0.454	0.095
LnTA	0.183	0.003	0.139	0.019	0.174	0.003	0.204	0.001	0.164	0.005	0.177	0.002
BIG4	2.285	<0.001	2.184	<0.001	2.289	<0.001	2.295	<0.001	2.250	<0.001	2.283	<0.001
LnAGE	4.353	<0.001	4.345	<0.001	4.348	<0.001	4.353	<0.001	4.356	<0.001	4.351	<0.001
G_TA	-0.014	0.053	-0.015	0.042	-0.014	0.049	-0.014	0.050	-0.014	0.053	-0.014	0.052
LOSS	-0.332	0.167	-0.381	0.111	-0.350	0.143	-0.339	0.156	-0.347	0.147	-0.340	0.155
UXAPNAS	0.020	0.429	0.019	0.445	0.020	0.437	0.019	0.459	0.021	0.407	0.019	0.445
AA	-6.899	<0.001	-6.912	<0.001	-6.898	<0.001	-6.915	<0.001	-6.888	<0.001	-6.900	<0.001
BDINDP	0.102	0.739	0.087	0.776	0.107	0.727	0.106	0.729	0.096	0.753	0.093	0.761
ACSIZE	-0.103	0.169	-0.100	0.184	-0.097	0.199	-0.070	0.368	-0.117	0.125	-0.099	0.190
INDEPAC	-0.169	0.465	-0.178	0.441	-0.171	0.460	-0.140	0.545	-0.177	0.445	-0.175	0.449
$YEAR_1$	0.104	0.653	0.074	0.748	0.099	0.667	0.075	0.746	0.108	0.641	0.096	0.678
$YEAR_2$	0.213	0.356	0.199	0.388	0.214	0.352	0.186	0.420	0.214	0.352	0.208	0.367
n		3,821		3,821		3,821		3,821		3,821		3,821
Adjusted R^2		0.333		0.334		0.333		0.333		0.333		0.333

a. p-values of the estimated parameters are reported as two-tailed.

b. LnAGE = natural log of age of the company as measured as the number of years the company has been listed on ASX; PQUAL =1 if the company has other than an unqualified opinion in the previous year, 0 otherwise; UXAF = unexpected audit fees; UXAPNAS = unexpected auditor provided non–audit fees; LOSS = 1 if the company reported a loss either in the current or previous year, 0 otherwise; AA = 1 if the auditor was Arthur Andersen during 2001, 0 otherwise. Other variables have been defined earlier in Tables 5.1 and 5.5.

This result indicates that the number of director and audit partner links in other companies is not associated with audit firm tenure. This finding does not support the reduction of auditor independence with higher number of director–audit partner links in other companies.

Hypothesis 2d

ACLKS is weakly significant and negative ($p = 0.065$), supporting hypothesis 2d, which is the posited association between audit committee member interlocking and audit firm tenure. This result indicates that the number of audit committee member links is negatively associated with audit firm tenure. This supports the proposition that audit committee members may recommend changing auditors more frequently to improve auditor independence.

Hypothesis 2e

ACAFLKS is not significant ($p = 0.227$), rejecting hypothesis 2e, which posits an association between audit committee member–audit firm interlocking and audit firm tenure. This result indicates that the number of links between audit committee member and an audit firm is not associated with audit firm tenure and, therefore, auditor independence.

Hypothesis 2f

ACAPLKS is not significant ($p = 0.648$), rejecting hypothesis 2f, which is the posited association between audit committee member–audit partner interlocking and audit firm tenure. This result indicates that the number of links between audit committee member and an audit partner in other companies is not associated with audit firm tenure and, therefore, auditor independence.

Control variables

Most of the control variables are significantly associated with AFTENURE. The coefficient of UXAF is positive and significant ($p = 0.023$). However, the coefficient of UXAPNAS is not significant ($p = 0.429$). The size of the company (LnTA), company age (LnAGE), and BIG 4 audit firms are significant and positive ($p = 0.003$, $p < 0.001$ and $p < 0.001$, respectively) indicating that large companies and companies listed on the ASX for longer periods and companies audited by BIG 4 audit firms have longer audit firm tenure. The control variable AA is significant and negative ($p < 0.001$). Control variables G_TA ($p = 0.053$) and PQUAL ($p = 0.091$) are weakly significant and negative. The coefficients of control variables LEVERAGE ($p = 0.575$), LOSS ($p = 0.167$), BDINDP ($p = 0.739$), ACSIZE ($p = 0.169$), INDEPAC ($p = 0.356$), $YEAR_1$ ($p = 0.653$) and $YEAR_2$ ($p = 0.356$) are not significantly associated with AFTENURE.

5.1.2.5 Sensitivity analyses

All regression models were re-run after clustering observations and including year dummies to avoid standard errors bias as they account for the residual dependence created by the firm effect as well as a time effect in a panel data set (Petersen, 2007).[56] The test variables DAFLKS ($p = 0.003$) and ACLKS ($p = 0.094$) remained significant (two–tailed) (albeit weakly in the case of ACLKS) and in the same directions (Appendix II, Table 2, Panel A). Thus, the results of the AFTENURE model are not biased by firm effect and time effect.

Furthermore, to test the impact of the Arthur Andersen (AA) dissolution on AFTENURE, all the models were re-run excluding the AA variable (207 observations) and all observations with a change in auditor in 2001 due to the dissolution of Arthur

[56] Please see section 5.1.1.5 for the arguments for clustering observations and including year dummies.

Andersen. DAFLKS (p = 0.001) and ACLKS (p = 0.082) remained significant (albeit weakly in the case of ACLKS) and in the same directions (Appendix II, Table 2, Panel B). That is, the results were robust.

Equation 2 was re-run excluding 1,042 observations observation which did not have audit committees. Firms without audit committees are likely to have different characteristics so the inclusion of these firms in the analyses may expose the study to self-selection bias. The results show that DAFLKS (p = 0.026) and ACLKS (p = 0.088) remained significant (albeit weakly in the case of ACLKS) as before (Equation 2) and ACAFLKS (p = 0.087) becomes weakly significant (Appendix II, Table 2, Panel C).

5.2 CHAPTER SUMMARY

This chapter reports the results of examining interlockings and their association with auditor independence. A summary of the findings for the test variables is provided in Table 5.9. The test variable DLKS is significantly and positively associated with APNAS fees, which provides evidence consistent with impaired auditor independence. In contrast, DAPLKS, ACAFLKS and ACAPLKS are significantly and negatively associated with APNAS fees, which does not support impaired auditor independence.

Table 5.9
Summary of findings for auditor independence hypotheses

Test Variables	APNAS	TENURE
DLKS	Positive	NS
DAFLKS	NS	Positive
DAPLKS	Negative	NS
ACLKS	NS	Negative (weak)
ACAFLKS	Negative	NS
ACAPLKS	Negative	NS

NS = not significant

Audit firm tenure, the second measure of auditor independence, results show a significant and positive association between DAFLKS and AFTENURE, which may support the argument for an audit firm rotation policy in interlocking environments to improve auditor independence. A significant negative association between ACLKS and AFTENURE support the argument that the audit committee members may recommend changing the incumbent audit firm more frequently to improve auditor independence. Chapter 6 reports the results of test for the association between interlockings and audit quality.

CHAPTER SIX
RESULTS AND DISCUSSION OF AUDIT QUALITY MODELS

6.0 INTRODUCTION

This chapter examines the association between interlockings and audit quality. First, this chapter examines whether interlockings are associated with the likelihood of issuing a qualified audit opinion by the auditor. Second, this chapter examines the association between interlockings and the absolute value of discretionary accruals. Discretionary accruals are calculated using the forward–looking Modified–Jones models.

6.1 AUDIT QUALITY

The following sections discuss the findings of the OPINION model.

6.1.1 AUDIT OPINION

This section uses an opinion prediction model to examine whether the interlockings are associated with the likelihood of issuing a qualified audit opinion by the auditor. The current year audit opinion (OPINION) is the dependent variable for testing the hypothesised variables. The dependent variable, OPINION, is the type of audit opinion: unqualified or other than unqualified. An unqualified audit opinion is coded as 0 and all other opinions as 1. The purpose of the OPINION prediction model is to examine the significance and direction of the coefficients of interlocking variables, after controlling for factors known to be associated with audit qualification. If the association is significant and negative (positive) then the likelihood of receiving a qualified opinion decline (increase) as the number of interlocking links increases (decreases). The following sections provide descriptive statistics for the OPINION model.

6.1.1.1 Descriptive statistics

Table 6.1 provides descriptive statistics for the OPINION model. Table 6.1 shows that 17 per cent of audit reports were other than an unqualified audit opinion during the period of study and this was consistent with the previous years' audit opinions (PQUAL, 17 per cent). Among the sample, 57 per cent of the companies were audited by BIG 4 audit firms. The average size of the companies (total assets) was $1,684 million.

Table 6.1
Descriptive statistics for the variables of the OPINION model
(N = 3,821)

Variables	Mean	Median	Std. Deviation
OPINION	0.17	0.00	0.38
DLKS	4.03	3.00	3.82
DAFLKS	0.89	0.00	1.36
DAPLKS	0.31	0.00	0.75
ACLKS	1.24	0.00	1.83
ACAFLKS	0.31	0.00	0.70
ACAPLKS	0.09	0.00	0.35
TA ($M)	1,684.00	22.00	17,818.00
BIG4	0.57	1.00	0.50
UXAF	0.00	0.00	0.71
UXAPNAS	0.00	1.24	3.90
LEVERAGE	0.43	0.33	0.67
LOSS	0.58	1.00	0.49
ROA	-0.12	-0.01	0.61
SQRSUBS	2.78	2.24	2.77
PQUAL	0.17	0.00	0.38
AFTENURE	7.57	5.00	7.12
INITIAL	0.22	0.00	0.42
BDINDP	0.68	0.71	0.19
ACSIZE	2.99	3.00	1.00
INDEPAC	0.73	1.00	0.44

OPINION = 1 if the auditor issues an other than unqualified opinion in the current year, 0 otherwise; DLKS = director interlock, DAFLKS = director–audit firm interlock; DAPLKS = director–audit partner interlock; ACLKS = audit committee member interlock; ACAFLKS = audit committee member–audit firm interlock; ACAPLKS = audit committee member–audit partner interlock; AFTENURE = number of years that the audit firm has been engaged with the current auditee; INDEPAC = 1 if the audit committee is comprised of a majority (fifty per cent or more) of non–executive directors, 0 otherwise; SQRSUBS = square root of subsidiaries; TA = total assets in millions of dollars; BIG 4 = 1 if a company's incumbent auditor is a BIG 4 audit firm, 0 otherwise; UXAF = unexpected audit fee; UXAPNAS = auditor provided unexpected non–audit fee; ROA = operating income divided by average total assets; LEVERAGE = ratio of total liabilities to total assets; INITIAL = 1 if the audit firm engagement either in the first or second year with the current auditee, 0 otherwise; PQUAL = 1 if the company has other than an unqualified opinion in the previous year, 0 otherwise; LOSS = 1 if the company reported a loss either in the current year or previous year, 0 otherwise; BDINDP = 1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; ACSIZE = number of audit committee members.

6.1.1.2 Comparison of OPINION between interlocking and non–interlocking companies

Table 6.2 shows the percentage of qualified audit opinions issued by auditors for interlocking and non–interlocking companies. The percentage of qualified audit opinions issued by the auditor of interlocking companies was significantly lower ($p < 0.001$) than non–interlocking companies for all cases. Auditors qualified 16 per cent of audit reports for DLKS companies and 24 per cent for non–DLKS companies. The percentage of qualified opinions between DAFLKS and non–interlocking was also significant ($p < 0.001$) with 12 per cent and 21 per cent receiving other than an unqualified opinion respectively. The percentage of qualified audit opinions for DAPLKS was also lower than that of non–interlocking companies (14 per cent and 18 per cent respectively) and the percentages were significantly different ($p = 0.008$). These results indicate that auditors of interlocking companies issued proportionately fewer qualified opinions than those of non–interlocking companies, but do not take account of factors suggesting deserved qualifications that may apply differently within each group of companies. This result may provide evidence of reduced audit quality in interlocking environments.

The percentages of qualified audit opinions issued by auditors for ACALKS, ACAPLKS and ACAPLKS were significantly different ($p < 0.001$) from those of non–interlocking companies. The percentage of qualified audit opinions for ACLKS companies was 11 per cent and 23 per cent for non–ACLKS interlocking companies. The percentage of qualified audit opinions for non–audit committee member–audit firm interlocking was 2.5 times higher than that of ACAFLKS companies (7 per cent and 20 per cent respectively). The percentage of qualified audit opinions of ACAPLKS companies was lower than that of non–interlocking companies (8 per cent and 18 per

Table 6.2

OPINION for interlocking and non–interlocking companies

		DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
		0	1	0	1	0	1	0	1	0	1	0	1
OPINION	Unqualified (0)	432	2,732	1,697	1,467	2,506	658	1,547	1,617	2,453	711	2,926	238
	Qualified (1)	138 (24%)	519 (16%)	452 (21%)	205 (12%)	550 (18%)	107 (14%)	465 (23%)	192 (11%)	601 (20%)	56 (7%)	637 (18%)	20 (8%)
χ^2			23.16		50.82		6.91		104.5		65.97		17.33
p-value (two-tailed)			<0.001		<0.001		0.008		<0.001		<0.001		<0.001

OPINION = 1 if the current year audit opinion is other than unqualified, 0 otherwise; DLKS = 1 if there is director interlock, 0 otherwise; DAFLKS = 1 if there is director–audit firm interlock, 0 otherwise; DAPLKS = 1 if there is director–audit partner interlock, 0 otherwise; ACLKS = 1 if there is audit committee member interlock, 0 otherwise ACAFLKS = 1 if there is audit committee member–audit firm interlock, 0 otherwise; ACAPLKS = 1 if there is audit committee member–audit partner interlock, 0 otherwise.

cent respectively) and was therefore significantly different ($p < 0.001$). This result may provide evidence of reduced audit quality in an audit committee member–audit firm/partner interlocking environment.

6.1.1.3 Correlations

Table 6.3 shows Pearson's correlation coefficients for the variables included in the OPINION model. As expected, all the test variables are negative and significantly correlated with OPINION. This result indicates that the number of interlocking links is negatively associated with receiving a qualified audit opinion (p-values are two-tailed). The correlation coefficients of DLKS, DAFLKS and DAPLKS are significant and negative ($p < 0.001$, $p < 0.001$ and $p = 0.008$ respectively). A significant negative association between DLKS, DAFLKS, DAPLKS and the likelihood of receiving a qualified opinion may constitute evidence of a compliant auditor in the issuing of audit opinions for linked companies. The correlation coefficients of ACLKS, ACAFLKS, ACAPLKS and the likelihood of receiving a qualified opinion are significant and negative ($p < 0.001$, $p < 0.001$ and $p = 0.003$ respectively). A significant negative association between ACLKS, ACAFLKS, ACAPLKS and the likelihood of receiving a qualified opinion might be evidence of sound corporate governance resulting in disputes resolved to the auditor's satisfaction and hence fewer qualified opinions for linked companies.

Additionally, auditors of linked companies may issue fewer qualified opinions due to the desire to continue an audit engagement and earn revenue from audit and APNAS fees. This is supported by the significant and positive correlations between the likelihood of receiving a qualified opinion and UXAF and negative association with AFTENURE ($p < 0.001$ and $p = 0.020$ respectively). The prior year audit opinion is

Table 6.3
Correlation matrix for OPINION as the dependent variable (N = 3,821)

Variables	OPINION	DLKS	DAFLKS	DAPLKS	ACLKS	ACAFLKS	ACAPLKS	LnTA	BIG4	UXAF	UXAPNAS
OPINION	1.000										
DLKS	-0.134 (<0.001)	1.000									
DAFLKS	-0.129 (<0.001)	0.617 (<0.001)	1.000								
DAPLKS	-0.043 (0.008)	0.225 (<0.001)	0.550 (<0.001)	1.000							
ACLKS	-0.162 (<0.001)	0.607 (<0.001)	0.413 (<0.001)	0.057 (<0.001)	1.000						
ACAFLKS	-0.118 (<0.001)	0.389 (<0.001)	0.613 (<0.001)	0.244 (<0.001)	0.633 (<0.001)	1.000					
ACAPLKS	-0.048 (0.003)	0.120 (<0.001)	0.313 (<0.001)	0.494 (<0.001)	0.261 (<0.001)	0.561 (<0.001)	1.000				
LnTA	-0.335 (<0.001)	0.386 (<0.001)	0.320 (<0.001)	-0.036 (0.026)	0.495 (<0.001)	0.359 (<0.001)	0.099 (<0.001)	1.000			
BIG4	-0.206 (<0.001)	0.209 (<0.001)	0.275 (<0.001)	-0.039 (0.017)	0.239 (<0.001)	0.253 (<0.001)	0.053 (0.001)	0.412 (<0.001)	1.000		
UXAF	0.113 (<0.001)	0.062 (<0.001)	-0.016 (0.310)	-0.145 (<0.001)	0.088 (<0.001)	0.006 (0.688)	-0.106 (<0.001)	0.000 (1.000)	0.000 (1.000)	1.000	
UXAPNAS	-0.022 (0.175)	0.028 (0.086)	0.000 (0.976)	-0.038 (0.020)	0.022 (0.168)	-0.018 (0.259)	-0.062 (<0.001)	0.000 (1.000)	0.000 (1.000)	0.257 (<0.001)	1.000
LEVERAGE	0.008 (0.631)	0.049 (0.003)	0.032 (0.050)	0.031 (0.057)	-0.020 (0.206)	-0.010 (0.552)	-0.002 (0.878)	-0.108 (<0.001)	0.023 (0.152)	0.000 (1.000)	0.000 (1.000)
LOSS	0.297 (<0.001)	-0.168 (<0.001)	-0.147 (<0.001)	0.043 (0.008)	-0.300 (<0.001)	-0.197 (<0.001)	-0.065 (<0.001)	-0.589 (<0.001)	-0.240 (<0.001)	0.012 (0.458)	-0.001 (0.953)
ROA	-0.241 (<0.001)	0.063 (<0.001)	0.043 (0.007)	-0.060 (<0.001)	0.142 (<0.001)	0.088 (<0.001)	0.021 (0.195)	0.343 (<0.001)	0.110 (<0.001)	0.000 (1.000)	0.000 (1.000)
SQRSUBS	-0.106 (<0.001)	0.287 (<0.001)	0.208 (<0.001)	-0.109 (<0.001)	0.335 (<0.001)	0.230 (<0.001)	-0.041 (0.011)	0.598 (<0.001)	0.256 (<0.001)	0.297 (<0.001)	0.050 (0.002)
LnAGE	0.065 (<0.001)	0.082 (<0.001)	0.059 (<0.001)	0.010 (0.524)	0.056 (<0.001)	0.017 (0.282)	-0.015 (0.342)	0.125 (<0.001)	0.066 (<0.001)	0.067 (<0.001)	-0.059 (<0.001)
INDEPAC	-0.153 (<0.001)	0.212 (<0.001)	0.134 (<0.001)	-0.069 (<0.001)	0.356 (<0.001)	0.212 (<0.001)	0.058 (<0.001)	0.409 (<0.001)	0.200 (<0.001)	0.088 (<0.001)	0.092 (<0.001)
PQUAL	0.644 (<0.001)	-0.128 (<0.001)	-0.124 (<0.001)	-0.028 (0.079)	-0.165 (<0.001)	-0.114 (<0.001)	-0.020 (0.217)	-0.326 (<0.001)	-0.210 (<0.001)	0.108 (<0.001)	0.008 (0.626)
AFTENURE	-0.038 (0.020)	0.087 (<0.001)	0.116 (<0.001)	0.014 (0.374)	0.067 (<0.001)	0.076 (<0.001)	-0.005 (0.765)	0.173 (<0.001)	0.188 (<0.001)	0.054 (0.001)	-0.011 (0.487)
INITIAL	0.069 (<0.001)	-0.040 (0.013)	-0.038 (0.018)	-0.003 (0.829)	-0.035 (0.031)	-0.042 (0.009)	-0.001 (0.943)	-0.087 (<0.001)	-0.152 (<0.001)	-0.033 (0.042)	-0.055 (0.001)
BDINDP	-0.045 (0.006)	0.106 (<0.001)	0.052 (0.001)	-0.047 (0.003)	0.117 (<0.001)	0.064 (<0.001)	-0.004 (0.809)	0.106 (<0.001)	0.095 (<0.001)	0.054 (0.001)	0.018 (0.275)
ACSIZE	-0.160 (<0.001)	0.204 (<0.001)	0.152 (<0.001)	-0.105 (<0.001)	0.471 (<0.001)	0.315 (<0.001)	0.126 (<0.001)	0.504 (<0.001)	0.237 (<0.001)	0.159 (<0.001)	0.095 (<0.001)

Table 6.3 (Contd.)

Variables	LEVERAGE	LOSS	ROA	SQRSUBS	LnAGE	INDEPAC	PQUAL	AFTENURE	INITIAL	BDINDP	ACSIZE
LEVERAGE	1.000										
LOSS	0.030 (0.063)	1.000									
ROA	-0.083 (<0.001)	-0.270 (<0.001)	1.000								
SQRSUBS	-0.013 (0.428)	-0.321 (<0.001)	0.128 (<0.001)	1.000							
LnAGE	0.017 (0.285)	-0.083 (<0.001)	0.040 (0.014)	0.194 (<0.001)	1.000						
INDEPAC	-0.036 (0.026)	-0.265 (<0.001)	0.123 (<0.001)	0.255 (<0.001)	-0.003 (0.837)	1.000					
PQUAL	0.010 (0.557)	0.298 (<0.001)	-0.210 (<0.001)	-0.119 (<0.001)	0.073 (<0.001)	-0.157 (<0.001)	1.000				
AFTENURE	-0.002 (0.915)	-0.121 (<0.001)	0.068 (<0.001)	0.139 (<0.001)	0.509 (<0.001)	0.041 (0.012)	-0.042 (0.010)	1.000			
INITIAL	0.015 (0.366)	0.065 (<0.001)	-0.061 (<0.001)	-0.039 (0.016)	-0.185 (<0.001)	-0.032 (0.051)	0.071 (<0.001)	-0.450 (0.000)	1.000		
BDINDP	0.006 (0.711)	-0.056 (0.001)	0.039 (0.015)	0.033 (0.043)	0.030 (0.060)	0.260 (<0.001)	-0.042 (0.010)	0.034 (0.037)	-0.057 (<0.001)	1.000	
ACSIZE	-0.041 (0.012)	-0.333 (<0.001)	0.170 (<0.001)	0.340 (<0.001)	0.018 (0.269)	0.521 (<0.001)	-0.166 (<0.001)	0.052 (0.001)	-0.030 (0.062)	0.159 (<0.001)	1.000

a. Two-tailed p values are presented in parentheses.
b. The variables have been defined in Tables 6.1 and 6.2.

significantly correlated with the current year's audit opinion ($p < 0.001$). Companies' age (LnAGE) and whether the audit engagement is in either its first or second year (INITIAL) are also significant and positively correlated with OPINION ($p < 0.001$ and $p < 0.001$), indicating that these companies are less likely to receive a qualified opinion. BIG 4 is negative and significant ($p < 0.001$) indicating that companies audited by BIG 4 audit firms are less likely to receive a qualified opinion. The size of the company (LnTA), ROA, and number of subsidiaries (SQRSUBS) are significantly and negatively correlated with OPINION ($p < 0.001$, $p < 0.001$ and $p < 0.001$ respectively) indicating that large, profitable and complex companies are less likely to receive a qualified opinion. A board as well as an audit committee comprising a majority of non–executive directors (BDINDP and INDEPAC) are significantly and negatively associated with OPINION ($p = 0.006$ and $p < 0.001$ respectively) indicating that companies comprising a majority of non–executive directors on their boards and audit committees are less likely to receive qualified audit opinions. ACSIZE is also significantly ($p < 0.001$) and negatively associated with OPINION. The LOSS variable is significantly and positively correlated with OPINION ($p < 0.001$) indicating that companies that incur a loss either in the previous or current year are more likely to receive a qualified audit opinion. Correlations for all other control variables are insignificant.

6.1.1.4 Multivariate statistics

Table 6.4 reports the logistic regression results for the OPINION model. The results provide evidence of whether the interlockings are associated with the likelihood of issuing a qualified audit opinion by the auditor after controlling for other characteristics that could affect the type of opinion to be received. The model is well

fitted with pseudo R^2s range from 0.536 to 0.541.[57] Direction for the hypotheses related to OPINION and interlockings (tabulated results are two-tailed) is not predicted.

Hypothesis 3a

DLKS is significant and negative (p = 0.014), supporting hypothesis 3a, which posits an association between director interlocking and the likelihood of receiving a qualified opinion. The result suggests that a higher number of links between directors in other companies may decrease audit quality as companies with more interlocking directors are less likely to receive a qualified opinion. Directors may pressure an auditor to issue an unqualified audit opinion because they want to be directors of more than one company. Prior research argues that directors of companies experiencing adverse events such as poor performance or financial distress or directors of companies which have switched their auditor after issuing a going–concern qualified audit report subsequently are less likely to serve as directors of other companies (Gilson, 1990; Carcello and Neal, 2003). Thus, directors may pressure the auditor not to qualify audit reports of linked companies even though it reduces audit quality.

Hypothesis 3b

DAFLKS is significant and negative (p = 0.004), supporting hypothesis H3b, which is the posited association between director–audit firm interlocking and the likelihood of receiving a qualified opinion. This result indicates that the number of links between directors and an audit firm in other companies is negatively associated with the company receiving a qualified audit opinion. This may provide evidence of

[57] Jubb (2000) uses the modified version of Dopuch *et al.'s* (1987) model and reports a pseudo R^2 of 0.431 for the sample of all qualifications and 0.452 for the sample of subject to qualification.

reduced audit quality because auditors qualified less than the appropriate level of qualification for director–audit firm interlocking companies (Jubb, 2000). Auditors may not qualify the audit reports of linked companies due to their closeness to a client's management and eagerness to satisfy the client (Arel *et al.,* 2005). Thus, a significant negative association between the number of director–audit firm interlockings and OPINION supports the proposition of reduced audit quality.

Hypothesis 3c

DAPLKS is significant and negative ($p < 0.001$), supporting hypothesis 3c, which is the posited association between director–audit partner interlocking and the likelihood of receiving a qualified opinion. This result indicates that the number of links between directors and an audit partner in other companies is negatively associated with the likelihood of receiving a qualified audit opinion. This result suggests that the personal relationships between the signing audit partner and directors who sit on more than one company's board may affect the audit partner's willingness to issue a qualified audit opinion. If an audit partner qualifies one or more audit reports from a family of linked companies, the linked companies may switch the incumbent auditor from the linked companies (Jubb and Houghton, 1999). To protect the audit engagement and continue to earn revenue in linked companies, the audit partner may not qualify the audit reports. Thus, a large number of director–auditor partner links in other companies decreases audit quality.

Hypothesis 3d

ACLKS is not significant ($p = 0.329$), rejecting hypothesis 3d, which is the posited association between audit committee member interlocking and the likelihood

Table 6.4
Logistic Regression results for OPINION as the dependent variable

(OPINION = α_0 +α_1INTERLOCKINGS +α_2BIG4 +α_3LnTA +α_4UXAF +α_5LEVERAGE +α_6PQUAL +α_7LnAGE +α_8UXAPNAS +α_9AFTENURE +α_{10}LOSS +α_{11}INITIAL +α_{12}ROA +α_{13}SQRSUBS + β_{14}BDINDP + β_{15}ACSIZE +α_{16}INDEPAC +$\beta_{17}$$YEAR_{03\text{-}05}$ +ε)

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.443	0.607	0.613	0.475	0.776	0.366	0.490	0.571	0.522	0.543	0.601	0.483
DLKS	-0.045	0.014										
DAFLKS			-0.164	0.004								
DAPLKS					-0.347	<0.001						
ACLKS							-0.048	0.329				
ACAFLKS									-0.187	0.136		
ACAPLKS											-0.530	0.006
LnTA	-0.249	<0.001	-0.263	<0.001	-0.268	<0.001	-0.255	<0.001	-0.258	<0.001	-0.262	<0.001
BIG4	-0.305	0.017	-0.253	0.051	-0.347	0.007	-0.310	0.015	-0.295	0.021	-0.323	0.012
UXAF	0.149	0.122	0.145	0.135	0.136	0.159	0.150	0.120	0.151	0.117	0.157	0.106
UXAPNAS	-0.022	0.130	-0.022	0.128	-0.024	0.092	-0.022	0.121	-0.023	0.113	-0.025	0.076
LEVERAGE	-0.017	0.184	-0.018	0.162	-0.018	0.169	-0.018	0.172	-0.017	0.188	-0.017	0.205
LOSS	0.857	<0.001	0.856	<0.001	0.861	<0.001	0.837	<0.001	0.843	<0.001	0.843	<0.001
ROA	-0.429	0.001	-0.412	0.001	-0.426	0.001	-0.412	0.001	-0.411	0.001	-0.415	0.001
SQRSUBS	0.111	<0.001	0.113	<0.001	0.109	<0.001	0.108	0.001	0.108	0.001	0.105	0.001
LnAGE	0.219	0.010	0.211	0.013	0.224	0.009	0.212	0.013	0.208	0.015	0.215	0.012
INDEPAC	-0.013	0.929	-0.027	0.852	-0.038	0.792	-0.015	0.917	-0.020	0.889	-0.020	0.892
PQUAL	3.017	<0.001	3.011	<0.001	3.014	<0.001	3.028	<0.001	3.029	<0.001	3.047	<0.001
AFTENURE	0.007	0.558	0.009	0.432	0.009	0.449	0.007	0.548	0.008	0.486	0.008	0.471
INITIAL	0.228	0.142	0.251	0.106	0.229	0.142	0.224	0.148	0.229	0.139	0.223	0.152
BDINDP	-0.048	0.784	-0.069	0.689	-0.079	0.649	-0.074	0.668	-0.081	0.639	-0.096	0.581
ACSIZE	0.043	0.367	0.046	0.330	0.033	0.488	0.057	0.242	0.057	0.237	0.059	0.212
$YEAR_1$	0.066	0.646	0.059	0.684	0.051	0.723	0.037	0.796	0.041	0.774	0.052	0.719
$YEAR_2$	-0.253	0.088	-0.252	0.089	-0.271	0.068	-0.271	0.067	-0.263	0.076	-0.265	0.074
n		3,821		3,821		3,821		3,821		3,821		3,821
LR χ^2 (14)		1490.656		1493.290		1499.914		1485.490		1486.812		1492.266
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-2016..687		-2014.053		-2007.429		-2021.853		-2020.531		-2015.077
Pseudo R^2		0.538		0.539		0.541		0.536		0.537		0.538

a. p-values of the estimated parameters are reported as two-tailed.
b. Variables have been defined earlier in Tables 6.1 and 6.2.

of receiving a qualified opinion. This result indicates that the number of audit committee member interlockings is not associated with the likelihood of issuing a qualified audit opinion by the auditors of linked companies, hence audit quality.

Hypothesis 3e

ACAFLKS is not significant (p = 0.136), rejecting hypothesis 3e, which is the posited association between audit committee member–audit firm interlocking and the likelihood of receiving a qualified opinion. This result indicates that the number of links between audit committee members and an audit firm is not associated with the likelihood of issuing a qualified audit opinion by the auditor and therefore, audit quality.

Hypothesis 3f

ACAPLKS is significant and negative (p = 0.006), supporting hypothesis 3f, which is the posited association between audit committee member–audit partner interlocking and the likelihood of receiving a qualified opinion. This result indicates that the number of audit committee member–audit partner links is negatively associated with the likelihood of issuing a qualified audit opinion by the auditor. An audit partner may have the intention to secure and maintain more audit engagements from a family of linked companies and so try to satisfy audit committee members by not qualifying audit reports where a qualification is warranted. As the personal relationship between audit committee members and a common audit partner gets closer in linked companies, the audit partner's incentives to challenge the client over accounting issues may decrease and he/she may not qualify the audit report in circumstances where a qualification is warranted (Jeppesen, 1998). Thus, a higher

number of audit committee member–audit partner links in other companies decreases audit quality.

Control variables

Most of the control variables are significantly associated with OPINION. The prior year audit opinion (PQUAL) is an important predictor of current year audit opinion evidenced by a significant ($p < 0.001$) and positive association between PQUAL and OPINION. A significant ($p < 0.001$) and negative association between auditee size (LnTA) and OPINION indicates that larger companies are less likely to receive a qualified opinion. ROA is negative ($p = 0.001$) and LOSS is positive and significant ($p < 0.001$), indicating that the auditor's opinion is affected by the profitability of the company. The association between the age of the company (LnAGE) and OPINION is positive and significant ($p = 0.010$) suggesting that auditors are more likely to issue a qualified opinion for older companies. SQRSUBS is significant ($p < 0.001$) and positive indicating that complex companies are more likely to receive a qualified opinion. BIG 4 is significant ($p = 0.017$) and negative indicating that companies audited by BIG 4 audit firm are less likely to receive a qualified opinion. $YEAR_2$ (2004) is weakly significant and negative ($p = 0.088$) with OPINION. All other control variables are insignificant.

6.1.1.5 Sensitivity analysis

The logistic regression was re-run after clustering observations and including year dummies.[58] The test variables DLKS ($p = 0.020$), DAFLKS ($p = 0.004$), DAPLKS ($p < 0.001$) and ACAPLKS ($p = 0.006$) remained significant and negative

[58] See section 5.1.1.5 for the arguments regarding clustering observations and including year dummies.

as before (Appendix II, Table 3, Panel A). Thus, the results of the OPINION model are not biased by firm effect or time effect.

The OPINION model (Equation 3) was re-run after redefining OPINION. Audit opinion was redefined as 1 for audit opinion if it involves a disagreement with management over accounting issues (not using acceptable accounting policies, not making required disclosures, valuation disagreements, etc.) and going–concern issues, 0 otherwise. The test variables DLKS (p = 0.046), DAFLKS (p = 0.065), DAPLKS (p = 0.031), and ACAPLKS (p = 0.067) remained significant, although less strongly for DAFLKS and ACAPLKS, and negative as before (Appendix II, Table 3, Panel B). Thus, the result is robust regardless of classification of audit opinion.

Prior research (e.g., Bartov *et al.*, 2001) argues that if discretionary accruals indicate earnings manipulations, they should be associated with the likelihood of auditors' issuing qualified audit reports. Bartov *et al.* (2001) finds a significant positive association between discretionary accruals and the likelihood of receiving a qualified opinion. Thus, the OPINION model was re-run including the absolute value of discretionary accruals (ABSDACC) as an additional control variable in equation 3.[59] The absolute value of discretionary accruals is not significant. The test variables DLKS (p = 0.095), DAFLKS (p = 0.055), DAPLKS (p = 0.002) and ACAPLKS (p = 0.001) remained significant, albeit more weakly for DLKS and DAFLKS, and negative as before (Appendix II, Table 3, Panel C). These results do not support the association between the absolute value of discretionary accruals and the likelihood of receiving a qualified opinion. Herbohn and Ragunathan (2008), using Australian data

[59] In the original OPINION model, DACC was not included because the objective of this study is to examine the OPINION of all types of companies including financial sector ones. DACC cannot be calculated for the financial sector.

over the period 1999–2003, reports that there is no evidence of earnings management leading to an audit opinion modification.

The OPINION model was re–run using interactions between ABSDACC and INTERLOCKINGS to capture any interaction effects. The test variables DLKS (weakly) ($p = 0.065$), DAFLKS ($p = 0.048$), DAPLKS ($p = 0.001$) and ACAPLKS ($p = 0.003$) remained significant, albeit weakly for DLKS, and negative as before (Appendix II, Table 3, Panel D). However, the interaction variable is insignificant. These results do not support the association between interaction of INTERLOCKINGS and ABSDACC and the likelihood of receiving a qualified opinion.

Chen *et al.* (2005) uses the interaction of non-audit fees and auditor tenure to capture any interaction effects between the two measures of auditor independence on the outcome of auditor-client negotiation over financial reporting issues. Their study finds a significant positive relation between the interaction of non-audit fees and the auditor tenure variable and the extent of client agreement, suggesting that non-audit fees do not affect the auditor's ability to resist client management pressure when auditor tenure is longer. The current study also examines the interaction between INTERLOCKINGS and APNAS and INTERLOCKINGS and AFTENURE. However, none of the interaction variables are significant with OPINION (Appendix II, Table 3, Panel E). Test variables DLKS ($p = 0.789$), DAFLKS ($p = 0.473$), DAPLKS ($p = 0.270$) and ACAPLKS ($p = 0.346$) became insignificant, which were significant in Equation 3. The results are inconsistent with the original analysis (Equation 3).

Prior studies (e.g., DeFond *et al.,* 2002; Carcello and Neal, 2000) exclude financial institutions when attempting to explain opinion variation. Equation 3 was re-run excluding 665 observations pertaining to financial institutions (GICS code 4010 to 4040) and documents (n = 3,156) that DLKS (p = 0.007), DAFLKS (p = 0.013), DAPLKS (p < 0.001), ACLKS (p = 0.082) and ACAPLKS (p = 0. 012) are significantly and negatively associated with OPINION (Appendix II, Table 3, Panel F). The results are robust (Equation 3). ACLKS became significant, which was insignificant in the original analysis (Equation 3).

Equation 3 was re-run excluding 1,042 observations which did not have audit committees. Firms without audit committees are likely to have different characteristics so the inclusion of these firms in the analyses may expose the study to self-selection bias. However, the result is robust (n = 2,779) (Equation 3) for audit committee member-audit firm/partner interlocking companies indicating that ACLKS (p = 0.585) and ACAFLKS (p = 0.205) remained insignificant and ACAPLKS (p = 0.003) is significant and negative (Appendix II, Table 3, Panel G). The results are consistent with those for the analysis of Equation 3 for audit committee member-audit firm/partner interlocking.

6.1.2 EARNINGS MANAGEMENT

The absolute value of discretionary accruals (ABSDACC) is used as a second proxy for measuring audit quality. Discretionary accruals are the focus of hypotheses H4a to H4f, which examine the association between the number of interlockings and the absolute value of discretionary accruals. Discretionary accruals is calculated by using the cross–sectional forward–looking Modified–Jones (1991) model suggested

by Dechow *et al.* (2003). The following sections provide descriptive statistics followed by analysis of any differences in the absolute value of discretionary accruals between interlocking and non–interlocking companies and then the results of correlation coefficients and regression.

6.1.2.1 Descriptive statistics

Table 6.5 shows descriptive statistics for the variables in the cross–sectional forward–looking Modified–Jones discretionary accruals model. Consistent with prior earnings management studies (e.g., Teoh *et al.,* 1998; Kothari *et al.,* 2005, Marciukaityte and Szewezyk, 2007), in all models, extreme observations were winsorised by setting

Table 6.5
Descriptive statistics for the variables of the DACC model
(N=2,817)

Variables	Mean	Median	Std. Deviation	25th Percentile	75the Percentile
TACC	-0.024	-0.012	0.087	-0.038	0.002
LTACC	-0.028	-0.014	0.101	-0.042	0.001
(ΔREV-ΔREC)	0.005	0.004	0.146	-0.010	0.040
PPE	0.088	0.052	0.103	0.012	0.137
S_GROWTH	0.358	0.078	10.187	-0.242	0.492
SDACC	0.001	0.008	0.068	-0.018	0.030
ABSDACC	0.042	0.025	0.053	0.011	0.051
+ DACC	0.036	0.024	0.039	0.012	0.046
- DACC	-0.051	-0.027	0.067	-0.063	-0.010
BIG4	0.564	1.000	0.496	0.000	1.000
EQUITY	0.580	1.000	0.470	0.000	1.000
MERACQS	0.203	0.000	0.403	0.000	0.000
LEVERAGE	0.370	0.322	0.325	0.101	0.533
LnMVE	17.201	16.873	1.984	15.762	18.391
MB	2.261	1.743	48.664	0.980	3.124
CASHFLOW	-0.286	-0.032	6.422	-0.183	0.082
LOSS	0.663	1.000	0.473	0.000	1.000
AFTENURE	7.582	5.000	6.898	3.000	10.000
UXAF	-0.002	0.001	0.538	-0.351	0.334
UXAPNAS	-0.009	1.191	3.808	-1.934	2.623
BDINDP	0.886	1.000	0.318	1.000	1.000
ACSIZE	2.116	2.000	1.587	0.000	3.000
INDEPAC	0.686	1.000	0.464	0.000	1.000

TACC = total accruals; (ΔREV – ΔREC) = change in revenue from period t-1 to period t minus change in accounts receivable from period t-1 to period t; PPE = gross value of property, plant and equipment; LTACC = value of total accruals in year t-1; S_GROWTH = next year sales minus current year sales divided by current year sales. All variables, other than S_GROWTH, are scaled by the average value of total assets. SDACC = signed discretionary accruals; ABSDACC = absolute value of discretionary accruals; (+) DACC = income–increasing discretionary accruals; (–) DACC = income–decreasing discretionary accruals; MB = market to book value; LnMVE = natural log of market value of equity; BDINDP = 1 if the board comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; ACSIZE = number of audit committee members; INDEPAC = 1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise; other variables have been defined in Table 6.1. Observations were winsorised at the top and bottom 1 per cent of discretionary accruals to control outliers.

the values in the bottom and top one per cent to the values of the 1st and 99th percentiles for discretionary accruals. The mean and median of total accruals (TACC) for the sample companies were -0.024 and -0.012 respectively. The same statistics for the lagged total accruals (LTACC) were -0.028 and -0.014 respectively. The mean and median for the absolute value of discretionary accruals (ABSDACC) were 0.042 and 0.025 respectively. The same statistics for the income–increasing discretionary accruals (+DACC) and income–decreasing discretionary accruals (–DACC) were 0.036 and 0.024, and -0.051 and -0.027 respectively. These results are consistent with other Australian studies (e.g., Coulton *et al.,* 2005; Ruddock and Taylor, 2005).

6.1.2.2 Absolute value of discretionary accruals between interlocking and non–interlocking companies

Table 6.6 shows the mean of ABSDACC for interlocking and non–interlocking companies. The mean ABSDACC of DAPLKS companies (0.049) was significantly higher (p = 0.002) than for non–interlocking companies (0.041). This finding indicates that audit quality might be reduced if there are links between director and audit partners. The mean ABSDACC of ACLKS (0.035) and ACAFLKS companies (0.032) was significantly lower than for non–interlocking (0.058 and 0.055 respectively) companies. This finding indicates that links between audit committee

members, audit committee members and an audit firm may improve audit quality. The mean ABSDACC between DLKS, DAFLKS and ACAPLKS companies was not significantly different from those of non–interlocking companies.

Table 6.6
ABSDACC for interlocking and non–interlocking companies

Test Variables	Interlocking			Non–interlocking			t	p-value Sig. (two-tailed)
	n	Mean	Std. Deviation	n	Mean	Std. Deviation		
DLKS	2,365	0.043	0.054	452	0.039	0.046	1.274	0.203
DAFLKS	1,137	0.041	0.054	1,680	0.043	0.052	-1.182	0.237
DAPLKS	457	0.049	0.059	2,360	0.041	0.052	3.044	0.002
ACLKS	1,266	0.035	0.045	1,551	0.048	0.058	-6.341	<0.001
ACAFLKS	473	0.032	0.040	2,344	0.044	0.055	-4.417	<0.001
ACAPLKS	122	0.042	0.056	2,695	0.042	0.053	0.007	0.995

Variables have been defined earlier in Table 6.1.

6.1.2.3 Correlations

Table 6.7 shows Pearson's correlation coefficients for the variables of the ABSDACC model (tabulated results are two-tailed). DAPLKS and ACAPLKS are positively and significantly correlated ($p < 0.001$ and $p = 0.005$) with ABSDACC. This result indicates that the number of links between directors and/or audit committee members and audit partners in other companies are positively associated with ABSDACC. This finding may provide evidence of reduced audit quality when there is a higher number of links between directors and/or audit committee members and an audit partner in other companies. There are significant and negative associations between DLKS ($p = 0.028$), ACLKS ($p < 0.001$) and ACAFLKS ($p = 0.001$) and ABSDACC. A significant and negative association may provide evidence of improved audit quality because higher quality audits are associated with lower levels of discretionary accruals (Francis *et al.*, 1999; Jubb, 2000).

Table 6.7
Correlation matrix for ABSDACC as the dependent variable (N = 2,817)

Variables	ABSDACC	DLKS	DAFLKS	DAPLKS	ACLKS	ACAFLKS	ACAPLKS	BIG4	EQUITY	MERACQS	LEVERAGE
ABSDACC	1.000										
DLKS	-0.041	1.000									
	(0.028)										
DAFLKS	-0.020	0.572	1.000								
	(0.284)	(<0.001)									
DAPLKS	0.076	0.185	0.520	1.000							
	(<0.001)	(<0.001)	(<0.001)								
ACLKS	-0.117	0.585	0.367	-0.013	1.000						
	(<0.001)	(<0.001)	(<0.001)	(0.474)							
ACAFLKS	-0.065	0.368	0.591	0.136	0.615	1.000					
	(0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)						
ACAPLKS	0.053	0.080	0.232	0.382	0.210	0.461	1.000				
	(0.005)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)					
BIG4	-0.090	0.187	0.233	-0.113	0.214	0.218	-0.025	1.000			
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.176)				
EQUITY	0.055	0.103	0.021	0.010	0.023	0.012	0.025	-0.025	1.000		
	(0.003)	(<0.001)	(0.259)	(0.594)	(0.215)	(0.505)	(0.180)	(0.178)			
MERACQS	-0.093	0.160	0.105	-0.050	0.213	0.123	-0.019	0.136	0.091	1.000	
	(<0.001)	(<0.001)	(<0.001)	(0.007)	(<0.001)	(<0.001)	(0.314)	(<0.001)	(<0.001)		
LEVERAGE	0.098	0.018	0.018	-0.092	0.127	0.111	0.071	0.083	-0.098	0.087	1.000
	(<0.001)	(0.341)	(0.329)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	
LnMVE	-0.251	0.357	0.250	-0.119	0.460	0.320	0.016	0.395	0.115	0.316	0.082
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.385)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
MB	-0.020	0.009	0.007	0.009	0.007	0.006	0.009	0.021	0.025	-0.001	-0.048
	(0.278)	(0.633)	(0.723)	(0.644)	(0.724)	(0.750)	(0.626)	(0.257)	(0.186)	(0.968)	(0.010)
CASHFLOW	-0.118	-0.006	-0.019	-0.055	0.029	0.017	0.004	-0.004	-0.018	0.015	-0.063
	(<0.001)	(0.729)	(0.318)	(0.003)	(0.116)	(0.364)	(0.823)	(0.834)	(0.329)	(0.417)	(0.001)
LOSS	0.230	-0.131	-0.080	0.147	-0.296	-0.168	0.033	-0.228	0.085	-0.269	-0.143
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.081)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
AFTENURE	-0.054	0.080	0.120	0.042	0.066	0.096	0.024	0.195	-0.037	0.041	0.020
	(0.004)	(<0.001)	(<0.001)	(0.022)	(<0.001)	(<0.001)	(0.191)	(<0.001)	(0.049)	(0.026)	(0.279)
LTACC	-0.115	-0.013	-0.040	-0.063	0.034	0.000	-0.047	0.029	-0.034	0.038	-0.087
	(<0.001)	(0.494)	(0.030)	(0.001)	(0.065)	(0.998)	(0.011)	(0.123)	(0.069)	(0.039)	(<0.001)
UXAF	0.043	0.032	0.008	-0.034	0.080	0.064	0.045	-0.002	0.000	0.025	0.141
	(0.023)	(0.085)	(0.653)	(0.070)	(<0.001)	(0.001)	(0.017)	(0.920)	(0.984)	(0.179)	(<0.001)
UXAPNAS	0.016	0.019	0.019	0.002	0.033	0.011	-0.014	0.000	0.002	0.005	0.048
	(0.401)	(0.302)	(0.304)	(0.913)	(0.081)	(0.543)	(0.466)	(0.987)	(0.895)	(0.770)	(0.010)
BDINDP	-0.007	0.083	0.029	-0.061	0.105	0.057	-0.010	0.094	-0.002	0.048	0.048
	(0.726)	(<0.001)	(0.120)	(0.001)	(<0.001)	(0.002)	(0.581)	(<0.001)	(0.922)	(0.010)	(0.010)
ACSIZE	-0.174	0.164	0.110	-0.153	0.438	0.280	0.085	0.232	-0.040	0.182	0.211
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.032)	(<0.001)	(<0.001)
INDEPAC	-0.124	0.120	0.068	-0.139	0.371	0.232	0.098	0.181	-0.028	0.130	0.200
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.135)	(<0.001)	(<0.001)

Table 6.7 (Contd.)

Variables	LnMVE	MB	CASHFLOW	LOSS	AFTENURE	LTACC	UXAF	UXAPNAS	BDINDP	ACSIZE	INDEPAC
LnMVE	1.000										
MB	-0.023 (0.221)	1.000									
CASHFLOW	0.048 (0.010)	0.016 (0.381)	1.000								
LOSS	-0.542 (<0.001)	-0.002 (0.923)	-0.044 (0.018)	1.000							
AFTENURE	0.155 (<0.001)	0.005 (0.793)	0.021 (0.267)	-0.126 (<0.001)	1.000						
LTACC	0.105 (<0.001)	-0.052 (0.005)	0.009 (0.641)	-0.138 (<0.001)	0.026 (0.167)	1.000					
UXAF	0.047 (0.013)	0.000 (0.999)	0.051 (0.007)	0.008 (0.651)	0.068 (<0.001)	-0.139 (<0.001)	1.000				
UXAPNAS	0.007 (0.715)	0.000 (1.000)	0.022 (0.238)	0.007 (0.693)	0.010 (0.6110	-0.023 (0.215)	0.181 (<0.001)	1.000			
BDINDP	0.097 (<0.001)	-0.003 (0.873)	-0.005 (0.787)	-0.070 (<0.001)	0.025 (0.175)	-0.016 (0.398)	0.055 (0.003)	-0.001 (0.976)	1.000		
ACSIZE	0.473 (<0.001)	0.027 (0.147)	0.048 (0.009)	-0.348 (<0.001)	0.052 (0.006)	0.052 (0.005)	0.143 (<0.001)	0.071 (<0.001)	0.155 (<0.001)	1.000	
INDEPAC	0.370 (<0.001)	0.035 (0.058)	0.050 (0.007)	-0.289 (<0.001)	0.027 (0.144)	0.028 (0.135)	0.135 (<0.001)	0.091 (<0.001)	0.217 (<0.001)	0.792 (<0.001)	1.000

a. Two-tailed p-values are presented in parentheses.

b. LTACC = value of total accruals in year t-1; that is the difference between the operating income (OI) and cash flow from operation (CFO) in previous year scaled by average of total assets of t-1 and t-2; CASHFLOW = cash flow from operations scaled by current year's total assets; LnMVE = natural log of market value of equity; a company's market value of equity is calculated as its price per share at fiscal year end times the number of shares outstanding. Other variables have been defined in Tables 6.1 and 6.5.

The control variables EQUITY, LEVERAGE and LOSS are significantly and positively correlated ($p = 0.003$, $p < 0.001$ and $p < 0.001$ respectively) with ABSDACC indicating that companies that issued new equity, had higher leverage and had incurred losses in the previous or current year, reported higher ABSDACC. There are significant and negative associations between BIG 4 ($p < 0.001$), LnMVE ($p < 0.001$) and ABSDACC indicating that companies audited by the BIG 4 audit firms as well as larger companies reported lower ABSDACC. Companies engaged in mergers/acquisitions (MERACQS) ($p < 0.001$) during the current period and companies that had higher CASHFLOW ($p < 0.001$) also reported lower ABSDACC. The correlation coefficient for AFTENURE is significant ($p = 0.004$) and negative indicating that audit firm tenure is negatively associated with ABSDACC. LTACC is significant ($p < 0.001$) and negative indicating that the previous year total accruals is negatively associated with ABSDACC. There is a significant and positive ($p = 0.023$) association between UXAF and ABSDACC. Audit committee size (ACSIZE) and audit committee comprises majority of non-executive directors (INDEPAC) are significantly ($p < 0.001$ and $p < 0.001$) and negatively associated with OPINION. All other control variables are insignificant.

6.1.2.4 Multivariate statistics

Table 6.8 reports the OLS regression results for the association between ABSDACC and interlockings (tabulated results are two-tailed). The model is significant ($p < 0.001$) with adjusted R^2s of 0.12.[60] The purpose of this regression is to determine whether there is a significant association between interlockings and ABSDACC after controlling for other factors that have an association with

[60] Ruddock and Taylor (2005) reports adjusted R^2s for the absolute value of discretionary accruals of 0.053 for ASX listed companies during 1993–2000. The regression results for the ABSDACC model remained the same after clustering observations and including year dummies.

ABSDACC. A positive association between the number of interlockings and ABSDACC might be interpreted as evidence of lower quality auditing in the presence of interlockings (Jubb, 2000). Alternatively, a negative association between the number of interlockings and ABSDACC may be interpreted as higher quality audit in the presence of interlockings (Francis *et al.*, 1999; Jubb, 2000). All the hypotheses in this section are non–directional due to competing arguments about associations between ABSDACC and interlockings.

Hypothesis 4a

DLKS is weakly significant ($p = 0.085$) and positive, supporting hypothesis 4a, which predicts an association between director interlocking and the absolute value of discretionary accruals. This result indicates that the number of director interlocks is positively associated with ABSDACC. Directors sitting on more than one company board may influence the earnings of linked companies because management and boards of directors which have the authority to specify the content of annual reports, may manage earnings to satisfy earnings estimates (Levitt, 1998). This finding may provide evidence of reduced audit quality when there is a higher number of director interlockings.

Hypothesis 4b

DAFLKS is significant ($p = 0.046$) and positive, supporting hypothesis 4b, which posits an association between director–audit firm interlocking and the absolute value of discretionary accruals. A significant positive association may support the fact that audit quality is reduced when there is more director–audit firm interlocking.

Table 6.8
Regression results for ABSDACC as the dependent variable

(ABSDACC = α_1 +β_1INTERLOCKINGS +β_2UXAF +β_3UXAPNAS +β_4AFTENURE +β_5BIG4 +β_6CASHFLOW +β_7LTACC +β_8LnMVE +β_9LEVERAGE +β_{10}MB +β_{11}LOSS +β_{12}MERACQS +β_{13}EQUITY+ β_{14}BDINDP + β_{15}ACSIZE +α_{16}INDEPAC +β_{17}YEAR$_{03\text{-}05}$ +ε)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.096	<0.001	0.095	<0.001	0.091	<0.001	0.093	<0.001	0.093	<0.001	0.093	<0.001
DLKS	0.000	0.085										
DAFLKS			0.003	0.046								
DAPLKS					0.002	0.062						
ACLKS							0.000	0.706				
ACAFLKS									0.001	0.558		
ACAPLKS											0.007	0.018
BIG4	0.001	0.545	0.001	0.651	0.002	0.409	0.001	0.500	0.001	0.530	0.001	0.431
EQUITY	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	<0.001
MERACQS	-0.002	0.297	-0.002	0.317	-0.002	0.339	-0.002	0.335	-0.002	0.341	-0.002	0.376
LEVERAGE	0.020	<0.001	0.019	<0.001	0.020	<0.001	0.019	<0.001	0.019	<0.001	0.019	<0.001
LnMVE	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
MB	0.000	0.244	0.000	0.249	0.000	0.248	0.000	0.253	0.000	0.253	0.000	0.248
CASHFLOW	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001
LOSS	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001
LTACC	-0.027	0.001	-0.027	0.001	-0.027	0.001	-0.027	0.001	-0.027	0.001	-0.027	0.001
AFTENURE	0.000	0.314	0.000	0.281	0.000	0.266	0.000	0.335	0.000	0.322	0.000	0.295
UXAF	0.003	0.066	0.003	0.063	0.003	0.059	0.003	0.067	0.003	0.068	0.003	0.072
UXAPNAS	0.000	0.616	0.000	0.616	0.000	0.613	0.000	0.595	0.000	0.589	0.000	0.542
BDINDP	0.002	0.473	0.002	0.415	0.002	0.382	0.002	0.420	0.002	0.413	0.002	0.370
ACSIZE	-0.003	<0.001	-0.003	0.001	-0.003	0.001	-0.003	0.001	-0.003	<0.001	-0.003	<0.001
INDEPAC	0.003	0.350	0.003	0.347	0.003	0.352	0.003	0.375	0.003	0.372	0.002	0.435
YEAR$_1$	-0.004	0.086	-0.003	0.104	-0.003	0.116	-0.003	0.115	-0.003	0.116	-0.003	0.121
YEAR$_2$	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001
n		2,817		2,817		2,817		2,817		2,817		2,817
Adjusted R^2		0.118		0.118		0.118		0.117		0.117		0.119

a. p-values of the estimated parameters are reported as two-tailed.

b. ABSDACC = absolute value of discretionary accruals; CASHFLOW = cash flow from operations scaled by current year's total assets; LTACC = value of total accruals in year t-1; LnMVE = natural log of market value of equity; other variables have been defined in Table 6.1 and 6.5.

c. DACC is calculated using the following equation:

$$TACC=\alpha + \beta_1(\Delta REV-\Delta REC) + \beta_2 PPE + \beta_3 LTACC + \beta_4 S\_GROWTH + \varepsilon$$

TACC = total accruals; (ΔREV – ΔREC) = change in revenue from period t-1 to period t minus change in account receivables from period t-1 to period t; PPE = gross value of property, plant and equipment; LTACC = value of total accruals in year t-1; S_GROWTH = next year's sales minus current year's sales divided by current year's sales. All variables, other than S_GROWTH, are scaled by the average value of total assets; DACC is the residual from the above model.

d. Reported results of the above table are after winsorising observations at the 1st and 99th percentiles for discretionary accruals.

Hypothesis 4c

DAPLKS is marginally significant (p = 0.062) and positive, providing some support for hypothesis 4c, which posits an association between director–audit partner interlocking and the absolute value of discretionary accruals. This result indicates that the number of links between director and a common audit partner in other companies is positively associated with ABSDACC. Discretionary accounting choices are used to 'smooth' reported earnings around some pre–determined target, and sometimes pressure is placed on audit partners to accept the managed earnings when client's income figures do not meet earnings forecasts (Ronen and Sadan, 1981; DeFond and Park, 1997; Gibbins *et al.,* 2005). An audit partner may tolerate managed earnings in order to continue the audit engagements with the family of linked companies. Thus, audit quality may be reduced when there is a higher number of links between directors and an audit partner, which is reflected in a significant positive association between DAPLKS and ABSDACC.

Hypothesis 4d

ACLKS is not significant (p = 0.706), rejecting hypothesis 4d, which is the posited association between audit committee member interlocking and the absolute value of discretionary accruals. This result indicates that the number of audit committee member interlockings is not associated with ABSDACC. This result does not provide support for reduced audit quality when there are more links between audit committee members in other companies.

Hypothesis 4e

ACAFLKS is not significant (p = 0.558), rejecting hypothesis 4e, which is the posited association between audit committee member–audit firm interlocking and the

absolute value of discretionary accruals. This result indicates that the number of links between an audit committee member and an audit firm in other companies is not associated with ABSDACC. This finding does not provide support of reduced audit quality when there is a higher number of links between audit committee members and audit firms in other companies.

Hypothesis 4f

ACAPLKS is significant ($p = 0.018$) and positive, supporting hypothesis 4f, which is the posited association between audit committee member–audit partner interlocking and the absolute value of discretionary accruals. This finding can be interpreted to suggest that the personal relationships between audit committee members and an audit partner in linked companies may affect audit quality. Audit partners may become too close to audit committee members by working together in more than one company and, due to their personal relationships and the incentive to continue providing their services to linked companies, audit partners may overlook the managed earnings of linked companies. Therefore, audit quality may decrease when there is a higher number of links between audit committee members and a common audit partner in other companies.

Control variables

Control variables CASHFLOW ($p < 0.001$), LnMVE ($p < 0.001$) and LTACC ($p = 0.001$) are negative and significant with respect to ABSDACC. EQUITY ($p < 0.001$) is positive and significantly associated with ABSDACC. LOSS is positive and significant ($p < 0.001$) indicating that where companies incur a loss either in the current year or previous year they report higher absolute value of discretionary accruals. The leverage of the company (LEVERAGE) is also positive and significant ($p < 0.001$)

indicating that leveraged companies may manipulate earnings. UXAF is significantly (weakly) ($p = 0.066$) and positively associated with ABSDACC. ACSIZE is significantly ($p < 0.001$) and negatively associated with ABSDACC. The dummy variables $YEAR_1$ (2003) and $YEAR_2$ (2004) are significantly ($YEAR_1$weakly) and negatively associated ($p = 0.086$ and $p < 0.001$) with ABSDACC. All other control variables are insignificant.

6.1.2.5 Sensitivity analyses

The regression was re–run without winsorising discretionary accruals (Appendix II, Table 4, Panel A). This produced adjusted R^2s range from 0.079 to 0.081 ($N = 2,817$), which are lower than in the earlier models. Only the test variable DLKS ($p = 0.011$) is significant. This result indicates that the outliers in the observations affect the association between the dependent and independent variables.

The industry levels regression was also re-run excluding observations of DACC $\geq 3\sigma$ (Appendix II, Table 4, Panel B). The adjusted R^2s range from 0.085 to 0.087 ($N = 2,758$). The test variables DLKS ($p = 0.045$), DAFLKS ($p = 0.091$) and ACAPLKS ($p = 0.069$) are significant, albeit that the latter two are weakly so, which is consistent with the original analysis (other than DAPLKS, which became insignificant, Equation 6). The regression was re-run again, after winsorising observations at the top 1 per cent and bottom 1 per cent of DACC, which produced adjusted R^2s range from 0.090 to 0.091 ($N = 2,758$) (Appendix II, Table 4, Panel C). Only ACAPLKS ($p = 0.056$) is weakly significant. The result is not consistent with the original model. This result indicates that outliers affect the association between the dependent and independent variables.

Resource dependence theory predicts that the largest companies in a market will be the most interlocked due to their greater demand for information and resources (Etheridge *et al.,* 2008). Both Dooley's (1969) and Ong *et al.'s* (2003) results support this prediction, using US and Singaporean samples respectively. Using Australian data, Etheridge *et al.* (2008) finds that the largest decile of companies is the most interlocked and the smallest decile of companies is the least interlocked. For testing the robustness of the discretionary accruals models, the regression for the larger and smaller companies was re-run. To identify the larger and smaller companies, the median value of LnMVE (16.8728) is used.[61] For the larger companies, the adjusted R^2s range from 0.088 to 0.090 (n = 1,408) and none of the test variables is significantly associated with the absolute value of discretionary accruals (Appendix II, Table 4, Panel D). However, for the smaller companies (Appendix II, Table 4, Panel E), DLKS (p = 0.007), DAFLKS (p = 0.013), DAPLKS (p = 0.054), ACAFLKS (p = 0.077) and ACAPLKS (p = 0.002) are positive and significantly (some weakly) associated with the absolute value of discretionary accruals, which is similar (ACAFLKS was insignificant and now it is significant) to the results of the original absolute value of discretionary accruals' model (Equation 6). The adjusted R^2s range from 0.086 to 0.092 (n = 1,409). These results may provide evidence of associations between interlockings and earnings management for the smaller companies but not in the case of the larger companies. The results may be interpreted as larger companies being less likely to engage in earnings management because they are more likely to face scrutiny from financial analysts and investors (Zhou and Elder, 2001; Rusmin *et al.,* 2005). Larger companies may choose Big 4 audit firms and are less likely to allow earnings management. Palmon *et al.* (2008) finds that the negative abnormal returns documented in Sloan (1996) primarily come from larger companies whereas positive abnormal returns come from smaller companies. Their

[61] Equation 6 was re-run using the median value of total assets to classify the largest and smallest companies, however, the results were consistent with the analyses of median value of LnMVE.

result suggests accrual anomaly to be a size dependent phenomenon and therefore brings an additional dimension to this well known anomaly. Francis and Wang (2006) finds that earnings quality increases for firms with Big 4 auditors based on abnormal accruals are smaller and earnings conservatism is greater. Thus, the results regarding associations between interlockings and the absolute value of discretionary accruals should be interpreted with caution.

There is research evidence of association between interlocking and profitability of a company. Fligstein and Brantley (1992) finds a negative association between director interlocks and profitability in their sample of large US firms, while other studies find that poorly performing firms are more likely to interlock than others (Dooley, 1969; Allen, 1974; Richardson, 1987; Mizruchi and Stearns, 1988; Lang and Lockhart, 1990; Boeker and Goodstein, 1991). Abarbanell and Lehavy (2003) suggests that the amount of managed earnings could be positively related to firm's performance. Lee *et al.* (2006) argues that the endogenously determined market response to reported earnings is more sensitive for firms with higher performance, which gives managers of these firms greater motivation to overstate earnings. Thus, the sample was split into two groups on the basis of median value of ROA (median ROA = -0.026) and two separate tests were run. The results show that DLKS ($p = 0.071$) and ACAPLKS ($p = 0.049$) are significantly, albeit weakly, associated with the absolute value of discretionary accruals for lower ROA (below median ROA = -0.026, n = 1,442) companies (Appendix II, Table 4, Panel F). The results are not consistent with the previous analyses (Equation 6). The results for the higher ROA (above median ROA = -0.026, n = 1,375) indicate that none of the test variables are significantly associated with the absolute value of discretionary accruals (Appendix II, Table 4, Panel G). The results are consistent with previous (size) analysis. The results provide evidence of association between

interlockings and discretionary accruals for lower profitable companies but not for higher profitable companies. Thus, the earnings management incentives of management may be affected by the performance of companies.

There are concerns among regulators, researchers and financial statement users about the distortions in earnings that can occur due to inappropriate income–increasing and/or income–decreasing accruals (Myers *et al.,* 2003). Myers *et al.* (2003) argues that income–increasing accruals can be used to inflate current earnings while income–decreasing accruals can be used to create "cookie jar reserves", which allow managers to increase future earnings. Therefore, discretionary accruals are classified into income–increasing and income–decreasing accruals to examine whether interlocking companies are engaged in earnings manipulation positively or negatively. Panels H and I of Appendix II, Table 4 report the OLS regression results for income–increasing and income–decreasing discretionary accruals respectively. The income–increasing discretionary accruals model is significant ($p < 0.001$) with an adjusted R^2 range from 0.075 to 0.076 ($n = 1,675$). None of the interlocking variables is significant with income–increasing discretionary accruals (Appendix II, Table 4, Panel H). These findings indicate that the number of interlocking links may not be associated with income–increasing discretionary accruals.

However, the income–decreasing discretionary accruals model is significant ($p < 0.005$) with adjusted R^2s of 0.20 ($n = 1,142$). Among the six interlocking variables, DLKS and DAFLKS are significant, albeit weakly for DAFLKS, ($p = 0.047$ and $p = 0.076$ respectively) and negative (Appendix II, Table 4, Panel I). The results indicate that companies with more links between directors and audit firms in other companies report income-decreasing discretionary accruals (conservative reporting due to the

expectation of earnings smoothing in the future). Rath and Sun (2007), using ten Australian industries during 2000–2006, finds that income–decreasing manipulations are employed more often than income–increasing earnings management. The above results of associations between income-decreasing and interlockings may indicate a higher quality audit as the auditor knows the directors better or could be indicative of directors trying to show auditors that they make conservative accounting choices.[62]

Equation 6 was re-run excluding 836 observations which did not have audit committees. Firms without audit committees are likely to have different characteristics so the inclusion of these firms in the analyses may expose the study to self-selection bias. However, the result is robust (n = 1,981) indicating that ACLKS (p = 0.438) and ACAFLKS (p = 0.523) remained insignificant as before and ACAPLKS (p = 0.006) is significant and negative (Appendix II, Table 4, Panel J).

Chen *et al.* (2005) finds a significant positive relation between the interaction of non-audit fees and the auditor tenure variable and the extent of client agreement. Their results suggest that non-audit fees do not affect the auditor's ability to resist client management pressure when auditor tenure is longer. The current study uses interactions between LnAPNAS and INTERLOCKINGS and AFTENURE and INTERLOCKINGS to investigate the joint effects of APNAS and AFTENURE and interlockings on earnings management. The interaction variable AFTENURE*ACAPLKS is weakly significantly and positively (p = 0.081) associated with the absolute value of discretionary accruals and none of the other interaction variables are significant (Appendix II, Table 4, Panel K). The results indicate that longer audit firm tenure and audit committee member and audit partner links are weakly positively associated with

[62] Zhou (2007) argues that reporting more conservatively (lower discretionary accruals) could be consistent with greater earnings management.

the absolute value of discretionary accruals. The test variable DAPLKS (p = 0.062) is weakly significant and DLKS (p = 0.124), DAFLKS (p = 0.167) and ACAPLKS (p = 0.757) became insignificant, which is inconsistent with the original analysis (Equation 6). The findings do not support the associations between the joint effects of APNAS and INTERLOCKINGS and AFTENURE and INTERLOCKINGS and absolute value of discretionary accruals.

6.2 CHAPTER SUMMARY

This chapter examines the association between audit quality and interlockings. The first proxy for audit quality, OPINION is significantly and negatively associated with DLKS, DAFLKS and DAPLKS. The results indicate that the number of links among these parties is negatively related to the likelihood of receiving a qualified audit opinion. There are significant and positive associations between DLKS, DAFLKS, and DAPLKS and ABSDACC, the second proxy for audit quality. Both proxies for audit quality provide consistent results with interlockings indicating reduced audit quality. A summary of findings for the test variables is provided in Table 6.9.

Table 6.9
Summary of findings for audit quality hypotheses

Test Variables	OPINION	ABSDACC
DLKS	Negative	Positive (weakly)
DAFLKS	Negative	Positive
DAPLKS	Negative	Positive (weakly)
ACLKS	NS	NS
ACAFLKS	NS	NS
ACAPLKS	Negative	Positive

NS = not significant

In contrast, ACLKS and ACAFLKS are not significantly associated with OPINION as well as with ABSDACC. However, the possibility that a personal relationship between audit committee members and an audit partner in linked

companies may affect audit quality is supported by a significant association between ACAPLKS and OPINION as well as ABSDACC. Again, both proxies for measuring audit quality provide consistent results with interlockings. Chapter 7 provides conclusion, limitations and opportunity for future research.

CHAPTER SEVEN
CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

7.0 INTRODUCTION

The associations between interlockings and auditor independence and audit quality are examined in this study. The types of interlocking used in this study are – director interlocking, director–audit firm interlocking, director–audit partner interlocking, audit committee member interlocking, audit committee member–audit firm interlocking and audit committee member–audit partner interlocking. The impact of interlockings on auditor independence and audit quality is an important issue because links created between director and/or audit committee member and a common auditor may undermine the appearance of auditor independence (Davison *et al.,* 1984; Jubb and Houghton, 1999; Jubb, 2000), which can affect actual or perceived audit quality. The current study uses four proxies for measuring audit quality. Auditor independence (a component of audit quality) is proxied by auditor provided non–audit services (APNAS) fees and audit firm engagement tenure (AFTENURE) with an existing client. Audit quality is proxied by the likelihood of issuing a qualified audit opinion (OPINION) by an auditor and discretionary accruals (DACC) tolerated by the auditor. The following sections discuss the findings from this study:

7.1 THE RESULTS

7.1.1 AUDITOR PROVIDED NON–AUDIT SERVICES FEES

The argument against the joint provision of audit and APNAS in this study is that directors of linked companies may purchase non–audit services from the incumbent auditor to create additional economic pressure that could result in a more compliant auditor who would allow management enough flexibility to attain its goals, such as receiving a favourable audit opinion and managing earnings (Williams, 1988). APNAS

may shorten the distance between the auditor and directors of linked companies when auditors perform work for an audit client that eventually feeds into or becomes part of the financial statements of the company, which may be a threat for auditor independence (Levitt, 2000). These situations might be more likely to arise where there are working relationships between directors and a common audit firm/partner in more than one company due to their personal relationships, the large investment in linked companies, economic dependency and mutual interests and the possibility of losing more if the auditor is replaced by the family of linked companies.

In contrast, auditor independence can be improved by strengthening the role of audit committees regarding the joint provision of audit and APNAS (Ramsay Report, 2001). The Ramsay Report (2001) recommends that audit committees should have the responsibility of stating in the annual report whether the level of APNAS is compatible with maintaining auditor independence and that they should include reasons why and areas where auditor independence becomes questionable. Audit committees should also review the economic importance of the company (in terms of audit and APNAS fees) to the auditor, and assess whether the economic importance of the company to the auditor may impair or appear to impair the auditor's judgment or independence (Ramsay Report, 2001). Thus, audit committee members working in more than one company where those companies are audited by a common auditor may limit or at least control the purchase of APNAS compared to where members have fewer audit committee positions to improve auditor independence. The following sections provide the results for hypotheses H1a – H1f. Non–directional hypotheses are created for the associations between APNAS fees and interlockings.

7.1.1.1 Hypotheses (H1a – H1f)

Director interlocking (DLKS) is significantly and positively associated with APNAS fees (supporting H1a). A positive significant association between DLKS and APNAS fees supports the proposition that the interlocking directors purchase more APNAS, which provides them with more power to pressure the auditors to act in the linked companies' favour. Director–audit firm interlocking (DAFLKS) is not significant (rejecting H1b). This does not provide evidence of impaired auditor independence when there are more directors and an audit firm links in other companies.

Audit committee member–audit firm interlocking (ACAFLKS) is significantly and negatively associated with APNAS fees (supporting H1e). A significant and negative association supports the proposition that audit committee members limit or at least control the purchase of non-audit services from incumbent audit firms in interlocking situations to improve perceptions of auditor independence.

Director–audit partner interlocking (DAPLKS) and audit committee member–audit partner interlocking (ACAPLKS) are significantly and negatively associated with APNAS fees (supporting H1c and H1f). A significant and negative association may indicate the benefits of knowledge–spillovers or discounted prices for APNAS due to the joint provision of audit and APNAS, which may not impair auditor independence. ACLKS is not significant (rejecting H1d).

The results of sensitivity tests of APNAS fee model are mixed. The results of sensitivity analyses are consistent with original model (Equation 1) when clustering observations and when excluding observations which did not audit committees. However, the results are not consistent with original model (Equation 1) when

excluding financial industries from the analysis. The results of examining FEERATIO are not consistent with the APNAS fee analysis.

These findings reveal that interlocking links of directors in other companies affect APNAS fees, which may impair auditor independence. The relationship generated between directors and a common audit firm may not be associated with impaired auditor independence. However, director-audit partner, audit committee member-audit firm and an audit partner links are negatively associated with APNAS fees, which may not impair auditor independence.

7.1.2 AUDIT FIRM TENURE

It has been argued than an audit firm rotation policy should be implemented as long–term relationships between auditors and their clients may negatively affect auditor independence (Walker *et al.,* 2001). Prior research also argues that there are perceptions that the auditor may become more accommodating to the client as auditor tenure increases (Shockley, 1981). This perception of impairment of auditor independence with longer auditor tenure would be due to expectations of complacency, a lack of innovation, less rigorous audit procedures, and an overconfidence of the auditor in the client (Shockley, 1981). The current study examines whether interlockings are associated with audit firm tenure. If audit firm tenure is positively and significantly associated with interlockings, it may signal impaired auditor independence because a long association may create a familiarity threat and the auditor may become too sympathetic to the client's interests (APES 110 Code of Ethics for Professional Accountants, 2006). A familiarity threat occurs by virtue of a close relationship with an audit client, its directors, officers or employees, a firm or a member of the assurance team (APES 110 Code of Ethics for Professional Accountants, 2006). A significant and

negative association may indicate that interlocking companies change auditors more frequently to improve auditor independence.

The following sections provide the findings of the audit firm tenure hypotheses H2a – H2f.Non–directional hypotheses are created for the associations between APTENURE and interlockings.

7.1.2.1 Hypotheses (H2a – H2f)

It is argued in this study that audit firm tenure might be longer if there are interlocking relationships between directors and/or audit committee members and a common audit firm/partner. If audit firm tenure is affected by interlocking associations, such interlockings can reduce auditor independence because a long association between management and the auditor is one of the main factors affecting perceptions of auditor independence (Hoyle, 1978). The results show that DAFLKS is positive and significantly associated with AFTENURE (supporting H2b). This finding supports the argument that auditors and directors may develop personal relationships over time based on trust and familiarity, which may be important for the maintenance of long–term auditor–client relationships and decrease the pressure for auditor changes (Courtney and Jubb, 2005). Thus, the finding provides evidence of impaired auditor independence when there are more links between director and audit firm.

In contrast, ACLKS is weakly significant and negatively associated with AFTENURE (supporting H2d). This result indicates that an audit committee may recommend changing the audit firm more frequently to improve perceptions of auditor independence. The test variables, DLKS, DAPLKS, ACAFLKS and ACAPLKS are not

significant (rejecting H2a, H2c, H2e and H2f). This result indicates that the number of these interlocking links is not associated with audit firm tenure.

The results of AFTENURE model are consistent when clustering observations, excluding AA observations from the sample. The results are also consistent when only including observation which had audit committees during the period of study.

Therefore, the findings indicate that a personal association between directors and an audit firm may lengthen audit firm tenure, which may impair auditor independence. In contrast, a personal association between audit committee members and an auditor may shorten the audit firm tenure, which might be interpreted as meaning that the audit committee recommends changing the audit firm more frequently to improve perceptions of auditor independence.

7.1.3 AUDIT OPINION

The relationships developed between directors and/or audit committee members and an audit firm/partner in linked companies may affect the auditor's decision about whether to qualify the audit reports of linked companies due to their frequent interactions and close relationships. The following sections provide the findings in relation to hypotheses H3a – H3f. Negative associations between OPINION and interlockings are predicted.

7.1.3.1 Hypotheses (H3a – H3f)

The results show that DLKS, DAFLKS and DAPLKS are significantly and negatively associated with the likelihood of issuing a qualified audit opinion by the auditor (supporting H3a, H3b and H3c). These results can be interpreted as evidence of

reduced audit quality because when there are more links between directors and between directors and audit firm/partner, the likelihood of receiving a qualified opinion decreases.

The associations between OPINION and ACLKS and ACAFLKS are not significant (rejecting H3d and H3e). The finding indicates that the associations between audit committee member and between audit committee member and audit firm in other companies are not associated with the likelihood of issuing a qualified opinion, and therefore, audit quality. However, ACAPLKS is significantly and negatively associated with the likelihood of receiving a qualified audit opinion (supporting H3f). This result indicates that when there are more links between audit committee member and an audit partner in other companies decrease the likelihood of receiving a qualified opinion and therefore, audit quality.

The results of sensitivity test of the OPINION model are consistent with the original model (Equation 3) when clustering observations, redefining audit opinion, including ABSDACC as an additional control variable, including interaction between ABSDACC and interlockings, and excluding financial industries. The results are not consistent with original model (Equation 3) when adding interaction between APNAS and interlockings and AFTENURE and interlockings, and excluding from the sample observations which did not have audit committees.

7.1.4 EARNINGS MANAGEMENT

Interlocking relationships between directors and/or audit committee members and an audit firm/partner may influence earnings management of linked companies, which may affect audit quality. The process of earnings management may be influenced

by the combined activities of directors, management and auditors because the preparation of financial statements is based largely on conventions, estimates and opinions resulting from the combined judgement of directors, auditors and advisors (Ball *et al.,* 1979).[63] Levitt (1998) argues that management and the board of directors, who have the authority to specify the contents of the annual reports, may manage earnings to satisfy consensus earnings estimates. Thus, the relationships between directors and/or audit committee members and an audit firm/partner in other companies may affect earnings management of the linked companies due to their close associations and large stakes in linked companies. The following sections provide the results for hypotheses H4a – H4f. Non–directional hypotheses for the associations between ABSDACC and interlockings were used.

7.1.4.1 Hypotheses (H4a – H4f)

The interlocking variables DLKS, DAFLKS, and DAPLKS are significantly and positively associated with the absolute value of discretionary accruals (supporting H4a, H4b and H4c). These findings indicate that the number of links between directors and between directors and audit firm/partners in other companies is associated with higher discretionary accruals for those companies, which provides evidence consistent with reduced audit quality.

ACLKS and ACAFLKS are not significantly associated with the absolute value of discretionary accruals (rejecting H4d and H4e). Thus, when there are more links between audit committee members and between audit committee member and audit firm in other companies does not affect the discretionary accruals of those companies and, therefore, audit quality.

[63] A revised version of the "Statement on the General Principles of Professional Auditing Practice" issued in 1954 by the Institute of Chartered Accountants in Australia, cited by Ball *et al.* (1979).

ACAPLKS is significantly and positively associated with the absolute value of discretionary accruals (supporting H4f) indicating that the number of links between audit committee members and an audit partner may affect reported earnings. Thus, the number of personal relations between an audit partner and audit committee members in other companies may influence both parties' behaviour with regard to earnings management issues, which may decrease audit quality.

The results are mixed in sensitivity tests of the DACC model. The results are consistent for smaller companies (below median size) with the original model (Equation 6). The results for both larger and more profitable companies are similar but not consistent with original model (Equation 6). The results of the rest of sensitivity analyses are not consistent with the original model (Equation 6).

7.2 IMPLICATIONS FROM THIS STUDY

The findings from this study have a number of implications for policy–makers and the existing literature. The findings may inform the policymakers and corporate boards and prompt them to consider the importance of promoting appropriate guidelines on the composition of boards of directors and audit committees for listed companies. The relationship created among directors and/or audit committee members and an audit firm/partner in other companies raises important public policy questions regarding auditor independence and audit quality that have not been addressed previously with the benefit of research evidence. The findings from this study provide evidence of these issues to policy–makers.

The impact of associations between audit committee members and an audit firm/partner in other companies and their association with auditor independence and

audit quality is explored in this study. The findings indicate that audit committee members sitting on more than one company's audit committee and having a common audit firm/partner may influence the audit committee members' behaviour in linked companies. Specifically, the relationship between audit committee members and audit partners in linked companies may degrade auditor independence and audit quality as indicated by the significant associations between ACAPLKS and APNAS fees, OPINION and DACC.

The findings related to APNAS fees and interlockings may be useful to regulators, professional accounting bodies, auditors and audit partners in the debate over the joint provision of audit and APNAS and auditor independence where directors, audit committee members and an audit firm/partner come together through linked companies. The findings for the audit firm tenure hypotheses can contribute to the potential policy implications for the debate surrounding mandatory audit firm rotation and the role of the independent auditor when audit firms/partners are associated repeatedly with directors and/or audit committee members.

The findings relating to audit quality might be useful to auditors, regulators and other users of audited financial statement information in regard to director and/or audit committee members and an audit firm/partner relations in the organisational environment. A significant association between interlockings and the likelihood of issuing a qualified opinion provides evidence of reduced audit quality, which supports the proposition that auditors of linked companies are less likely to qualify an audit report, perhaps due to the possibility of revenue losses and damage to personal relations in a family of linked companies. The findings relating to earnings management also provide evidence of compromised audit quality in interlocking situations because the

number of interlocking links is significantly associated with the absolute value of discretionary accruals. The findings from the audit opinion and earnings management produce consistent evidence to support the view that certain types of interlockings are linked with biased financial reporting. These findings may support any future regulatory initiatives to prevent firms from appointing directors of companies with the same auditor or for limiting the number of directorships that can be acquired.

The findings of the current study offer additional information on global concern over the incidence of interlocking directorates (Pass, 2004; Kiel and Nicholson, 2006). The Australian Shareholders Association is concerned that any director who serves on more than five boards is not acting in the best interest of company shareholders (Kiel and Nicholson, 2006). In the light of these concerns, in determining the independence of directors and whether a director has a material relationship with the company or another party that might impair their independence, *ASX Corporate Governance Council Recommendations 2.2 and 2.3.* (2003) recommends that boards consider all relevant facts and circumstances, including any interlocking board or other company committee relationships. The findings of the current study provide evidence of compromised audit quality in director and/or audit committee member-audit firm/partner interlocking.

The findings also enrich the existing literature where there is a lack of research evidence on the impact of relationships between directors and/or audit committee members and audit firms/partners on auditor independence and audit quality. The findings from this study offer at least two important contributions to the extant literature. First, this is the first study provide evidence on how an interlock associated with having the same audit partner can lead to biased financial reporting. Second, while studies examining audit committee effectiveness have primarily focused on the effect of

characteristics such as independence, expertise, and diligence, the current study appears to be the first to provide evidence how the effectiveness of audit committees can be compromised by the presence of interlocking associations between audit committee member and audit partners. This is supported by the significant associations between audit opinion and earnings management based results for audit committee member and audit partner interlocks. Thus, the findings of the current study would be useful for regulators evaluating whether to limit the number of directorships and/or audit committee memberships where there are common audit firms and audit partners for those companies. The regulators may also consider imposing a "cooling-off" period for directors to be a member of other boards or audit committees in other companies with the same audit firm/partner to improve auditor independence.

7.3 LIMITATIONS

This study has a number of limitations. First, the findings from this study are limited to the period studied and, moreover, may not be generalisable to other countries or environments that do not have similar characteristics. The other limitations of this study are discussed below.

Executive and non–executive directors are not separated in calculating interlockings. It is difficult to identify the actual independent directors because most of the small and medium size companies during the period of study do not provide detailed information about director independence. That is why the choice was made not to use an executive/non–executive classification of directors.

Directors'/audit committee members' expertise or educational background is not explored in this study. This is done because during the period of study many small

companies do not specifically disclose the directors' qualifications. Expert and professionally qualified audit committee members may be more effective in performing their monitoring roles and may have a higher probability of being appointed to more than one company's audit committee. Experienced director and/or audit committee member interlocking may have more affect on companies' decision–making and also may be more in demand.

Other types of interlockings identified in the literature (e.g., Fich and White, 2005) such as, CEO interlocking, indirect interlocking and reciprocal interlocking, which may have different effects on auditor independence and audit quality, are not included in this study.

Distinction between director interlocking, audit committee member interlocking and director and/or audit committee member and audit firm/partner links that arise in connection with motivations other than the strategy argued throughout this study are not explored. For example, multiple board holdings may be the result of personal empire building and director–auditor links may arise purely by chance and the association might be non–strategic rather than a deliberate strategy (Jubb, 2000).

The number of interlocking links calculated in this study is based on the sample companies. Any additional position holds by directors, audit committee members and audit firm/partner outside the sample companies were not included due to the lack of information available in companies' annual reports.

The commencement date of audit firm/partner audit engagement and the joining date of directors in linked companies, which may have an association with auditor selection, is not explored in this study.

There are shortcomings involved in using the proxies for measuring auditor independence and audit quality. However, as auditor independence and audit quality are hard, if not impossible, to observe, previous research uses earnings management surrogates (Menon and Williams, 2004; Myers *et al.,* 2003), accounting conservatism (Hamilton *et al.,* 2005) or audit opinion (DeFond *et al.,* 2002; Geiger and Raghunandan, 2002) as proxies for audit quality. Thus, the findings from this study should be interpreted in light of the limitations of the proxies used.

The auditor independence and audit quality models used in this study include control variables that are considered appropriate. Some of the variables are likely to be subject to measurement errors. There may be other influential variables that have been omitted from the models, which could affect the findings from this study.

7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

This is the first study to investigate audit committee members and audit firms/partners interlocking and their influence on auditor independence and audit quality. This study opens up this area of research on interlockings and their effects on audit and APNAS fees as well as audit firm tenure and audit quality. Future research may involve investigating the following issues.

First, future researchers can consider the separate impact of interlocked executive and non–executive directors on auditor independence and audit quality. Also,

identifying the impact of different types of interlockings such as direct/indirect interlocking, reciprocal interlocking and CEO interlocking on auditor independence and audit quality.

Second, future studies can identify the engagement date of audit firm/partner and the joining date of directors in linked companies to investigate whether the directors have direct influence on auditor selection.

Third, future studies can classify the types of APNAS fees (which have been available from 2005 onwards) to see the impact of interlockings on each type of APNAS fee. For instance, investigating if directors and/or audit committee members have more or less influence on specific types of APNAS.

Fourth, future researchers can consider the effects of interlockings between directors of companies in the same industry and their effect on auditor independence and audit quality. The issue would provide evidence on whether industry specialists have more interlocking with industry expert directors or with other types of companies.

Last but not the least, future studies also can use the data about relationships between directors and/or audit committee members that have lasted for an extended period to identify whether directors and/or audit committee members' interlocking companies have been audited by the same audit firm/partner over that time period.

7.5 CONCLUDING REMARKS

This study provides evidence that the relationships generated between directors and/or audit committee members and a common audit firm/partner with other

companies may impair auditor independence as well as degrade audit quality. The results from the auditor independence based analyses are not consistent with the conclusion that all types of links used in the current study may impair auditor independence. However, the results from the audit quality based tests provide consistent evidence to suggest that director interlocking, director-audit firm/partner interlocking and audit committee member-audit partner interlocking impair audit quality. The results can be interpreted that interlocking directors and/or audit committee members are associated with lower audit quality not because they impair auditor independence, but because they are too busy to effectively monitor the management of their firms as a result of their multiple directorship and/or audit committee memberships. Thus, the findings will be of interest to regulators to support the view that certain types of interlockings are linked with biased financial reporting. The results support the future regulatory initiatives to impose a "cooling-off" period before a director can serve as a director and/or audit committee member of another company with the same auditor.

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APPENDICES

Appendix – I
Summary of variable definitions

Test variables	
DLKS	Director interlocks
DAFLKS	Director–audit firm interlocks
DAPLKS	Director–audit partner interlocks
ACLKS	Audit committee member interlocks
ACAFLKS	Audit committee member–audit firm interlocks
ACAPLKS	Audit committee member–audit partner interlocks
Other interlocking variables	
TDLKS	Total director interlocks
TDAFLKS	Total director–audit firm interlocks
TDAPLKS	Total number of director–audit partner interlocks
TACLKS	Total audit committee member interlocks
TACAFLKS	Total audit committee member–audit firm interlocks
TACAPLKS	Total number of audit committee member–audit partner interlocks
Dependent Variables	
LnAPNAS	Natural log of auditor provided non–audit services fees
AFTENURE	Number of years the audit firm has been engaged by the current client
OPINION	1 if the auditor issues other than an unqualified opinion in the current year, 0 otherwise
DACC	Discretionary accruals
ABSDACC	Absolute value of discretionary accruals
TACC	Total accruals is the difference between operating income (OI) and cash flow from operations

+DACC	Income-increasing discretionary accruals
-DACC	Income-decreasing discretionary accruals
Independent variables	
LnTA	Natural log of total assets
BIG 4	1 if a company's incumbent auditor is a BIG 4 audit firm, 0 otherwise;
EQUITY	1 if the company issues new shares during the current year, 0 otherwise
MERACQS	1 if the company is engaged in a merger/acquisition activity in the current year, 0 otherwise
ROA	Operating income divided by average total assets
LEVERAGE	Ratio of total liabilities to total assets
NEG_ROA	1 if the firm reports a negative return on assets in the current year, 0 otherwise
MB	Market–to–book ratio at fiscal–year–end, defined as market value of equity divided by shareholder equity
INITIAL	1 if the audit firm engagement is in either the first or second year with the current auditee, 0 otherwise
UXAF	Unexpected audit fees estimated from the residuals of the audit fee model
UXAPNAS	Unexpected APNAS fees estimated from the residuals of the APNAS fee model
PQUAL	1 if the company has other than an unqualified opinion in the previous year, 0 otherwise
LnAGE	Natural log of age of the company measured as the number of years the company has been listed on the ASX
G_TA	Growth – measured as percentage change in total assets from the previous period

LOSS	1 if the company reported a loss either in the current year or previous year, 0 otherwise
AA	1 if the audit firm was Arthur Andersen during 2001, 0 otherwise
SQRSUBS	square root of number of subsidiaries
INDEPAC	1 if the audit committee comprises a majority (fifty per cent or more) of non–executive directors, 0 otherwise
OI	Operating income
CFO	Cash flow from operations
ΔREV	change in revenue from period t-1 to period t
ΔREC	Change in net accounts receivables from period t-1 to period t
PPE	Gross value of property, plant and equipment
LTACC	Value of total accruals in year t-1; that is the difference between the operating income (OI) and cash flow from operation (CFO) in previous year scaled by average of total assets of t-1 and t-2
S_GROWTH	Next year sales minus current year sales divided by current year sales
CASHFLOW	Cash flow from operations scaled by current year's total assets
LnMVE	Natural log of market value of equity. A company's market value of equity is calculated as its price per share at fiscal year end times the number of shares outstanding
BOARDINDP	percentage of non–executive directors on board
BDINDP	1 if the majority (fifty per cent or more) board members are non-executive, 0 otherwise
ACSIZE	Number of audit committee members
$YEAR_{03\text{-}05}$	Dummy variables for year of data
ΣINDUSTRY	1 if in the nominated industry group, 0 otherwise; 25 dummies for 26 ASX industry groups.

Appendix – II

Table 1
Sensitivity analysis for APNAS fees (APNAS)

Panel A: APNAS fees after clustering and including year dummies

Variables	H1a		H1b		H1c		H1d		H1e		H1f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-6.075	<0.001	-6.415	<0.001	-6.518	<0.001	-6.585	<0.001	-6.834	<0.001	-6.587	<0.001
DLKS	0.040	0.032										
DAFLKS			0.035	0.491								
DAPLKS					-0.401	0.017						
ACLKS							-0.018	0.675				
ACAFLKS									-0.229	0.022		
ACAPLKS											-0.838	<0.001
LnTA	0.777	<0.001	0.797	<0.001	0.805	<0.001	0.807	<0.001	0.817	<0.001	0.807	<0.001
LEVERAGE	0.010	0.012	0.010	0.007	0.011	0.006	0.011	0.006	0.011	0.005	0.011	0.006
EQUITY	0.413	0.004	0.430	0.002	0.432	0.002	0.432	0.002	0.431	0.002	0.439	0.002
ROA	-0.254	0.026	-0.261	0.023	-0.274	0.017	-0.267	0.020	-0.275	0.016	-0.276	0.015
NEG_ROA	-0.078	0.663	-0.060	0.738	-0.047	0.793	-0.056	0.755	-0.054	0.764	-0.040	0.820
MB	0.000	0.320	0.000	0.341	0.000	0.348	0.000	0.351	0.000	0.359	0.000	0.334
MERACQS	-0.115	0.537	-0.095	0.609	-0.097	0.601	-0.086	0.644	-0.083	0.655	-0.099	0.593
BIG4	0.716	<0.001	0.714	<0.001	0.725	<0.001	0.732	<0.001	0.769	<0.001	0.740	<0.001
INITIAL	-0.601	<0.001	-0.603	<0.001	-0.602	<0.001	-0.600	<0.001	-0.600	<0.001	-0.594	<0.001
BDINDP	-0.213	0.301	-0.187	0.362	-0.191	0.353	-0.183	0.373	-0.184	0.371	-0.202	0.326
ACSIZE	0.244	<0.001	0.244	<0.001	0.242	<0.001	0.250	<0.001	0.264	<0.001	0.272	<0.001
INDEPAC	0.520	0.001	0.537	0.001	0.537	0.001	0.543	<0.001	0.541	<0.001	0.532	0.001
$YEAR_1$	0.346	0.028	0.367	0.019	0.370	0.019	0.368	0.019	0.360	0.022	0.354	0.024
$YEAR_2$	0.179	0.259	0.188	0.235	0.186	0.241	0.187	0.238	0.185	0.241	0.170	0.282
n		3,821		3,821		3,821		3,821		3,821		3,821
Adjusted R^2		0.319		0.318		0.318		0.318		0.319		0.322

Panel B: APNAS fees to total of audit and APNAS fees (FEERATIO)

Variables	H1a		H1b		H1c		H1d		H1e		H1f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-0.232	<0.001	-0.240	<0.001	-0.251	<0.001	-0.256	<0.001	-0.258	<0.001	-0.253	<0.001
DLKS	0.002	0.086										
DAFLKS			0.004	0.158								
DAPLKS					-0.004	0.357						
ACLKS							-0.001	0.581				
ACAFLKS									-0.005	0.347		
ACAPLKS											-0.023	0.026
LnTA	0.025	<0.001	0.025	<0.001	0.026	<0.001	0.026	<0.001	0.026	<0.001	0.026	<0.001
LEVERAGE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
EQUITY	0.032	<0.001	0.032	<0.001	0.033	<0.001	0.033	<0.001	0.033	<0.001	0.033	<0.001
ROA	-0.011	0.079	-0.011	0.078	-0.012	0.059	-0.012	0.063	-0.012	0.061	-0.012	0.059
NEG_ROA	0.015	0.120	0.016	0.111	0.017	0.091	0.016	0.099	0.017	0.096	0.017	0.089
MB	0.000	0.305	0.000	0.313	0.000	0.326	0.000	0.330	0.000	0.331	0.000	0.320
MERACQS	0.002	0.874	0.002	0.822	0.002	0.811	0.003	0.765	0.003	0.780	0.002	0.812
BIG4	0.046	<0.001	0.044	<0.001	0.046	<0.001	0.046	<0.001	0.047	<0.001	0.047	<0.001
INITIAL	-0.015	0.072	-0.016	0.069	-0.015	0.072	-0.015	0.074	-0.015	0.074	-0.015	0.076
BDINDP	-0.007	0.550	-0.006	0.608	-0.006	0.610	-0.005	0.633	-0.006	0.625	-0.006	0.596
ACSIZE	0.007	0.020	0.007	0.021	0.006	0.022	0.007	0.017	0.007	0.014	0.007	0.010
INDEPAC	0.019	0.026	0.020	0.021	0.020	0.020	0.020	0.018	0.020	0.019	0.020	0.021
$YEAR_1$	0.041	<0.001	0.041	<0.001	0.042	<0.001	0.042	<0.001	0.042	<0.001	0.041	<0.001
$YEAR_2$	0.027	0.002	0.027	0.002	0.027	0.002	0.027	0.002	0.027	0.002	0.027	0.002
n		3,821		3,821		3,821		3,821		3,821		3,821
Adjusted R^2		0.140		0.139		0.139		0.139		0.139		0.140

Panel C: APNAS fees excluding financial industries

Variables	H1a		H1b		H1c		H1d		H1e		H1f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-7.166	<0.001	-7.351	<0.001	-7.463	<0.001	-7.397	<0.001	-7.720	<0.001	-7.407	<0.001
DLKS	0.031	0.145										
DAFLKS			0.282	0.063								
DAPLKS					0.008	0.943						
ACLKS							0.018	0.710				
ACAFLKS									0.000	0.022		
ACAPLKS											-0.364	0.150
LnTA	0.852	<0.001	0.862	<0.001	0.870	<0.001	0.866	<0.001	0.869	<0.001	0.868	<0.001
LEVERAGE	0.010	0.011	0.010	0.008	0.011	0.007	0.010	0.007	0.011	0.006	0.011	0.007
EQUITY	0.325	0.041	0.342	0.031	0.340	0.032	0.339	0.032	0.333	0.035	0.339	0.032
ROA	-0.320	0.007	-0.322	0.007	-0.328	0.006	-0.327	0.006	-0.325	0.006	-0.331	0.005
NEG_ROA	0.047	0.809	0.051	0.793	0.057	0.770	0.061	0.756	0.063	0.749	0.057	0.769
MB	0.001	0.093	0.001	0.093	0.001	0.093	0.001	0.093	0.001	0.092	0.001	0.092
MERACQS	-0.177	0.392	-0.169	0.414	-0.162	0.434	-0.167	0.420	-0.170	0.411	-0.165	0.423
BIG4	0.640	<0.001	0.624	<0.001	0.650	<0.001	0.647	<0.001	0.649	<0.001	0.644	<0.001
INITIAL	-0.550	0.001	-0.553	0.001	-0.546	0.001	-0.547	0.001	-0.555	0.001	-0.543	0.001
BDINDP	-0.207	0.356	-0.189	0.399	-0.188	0.402	-0.190	0.396	-0.202	0.367	-0.198	0.376
ACSIZE	0.226	<0.001	0.225	<0.001	0.226	<0.001	0.220	<0.001	0.239	<0.001	0.236	<0.001
INDEPAC	0.571	0.001	0.583	0.001	0.586	0.001	0.581	0.001	0.574	0.001	0.586	0.001
$YEAR_1$	0.393	0.023	0.408	0.018	0.412	0.017	0.415	0.016	0.404	0.019	0.408	0.018
$YEAR_2$	0.290	0.095	0.295	0.089	0.298	0.086	0.301	0.083	0.286	0.099	0.288	0.098
n		3,156		3,156		3,156		3,156		3,156		3,156
Adjusted R^2		0.319		0.319		0.319		0.319		0.320		0.319

Panel D: APNAS fess for audit committees sample companies

Variables	H1a		H1b		H1c		H1d		H1e		H1f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-5.477	<0.001	-6.173	<0.001	-6.184	<0.001	-6.207	<0.001	-6.451	<0.001	-6.145	<0.001
DLKS	0.045	0.023										
DAFLKS			-0.017	0.756								
DAPLKS					-0.326	0.002						
ACLKS							-0.019	0.634				
ACAFLKS									-0.224	0.020		
ACAPLKS											-0.849	<0.001
LnTA	0.766	<0.001	0.805	<0.001	0.809	<0.001	0.807	<0.001	0.818	<0.001	0.808	<0.001
LEVERAGE	0.047	0.183	0.051	0.147	0.054	0.124	0.052	0.145	0.057	0.110	0.061	0.082
EQUITY	0.374	0.016	0.398	0.011	0.403	0.010	0.398	0.011	0.395	0.011	0.401	0.010
ROA	0.032	0.866	0.020	0.915	0.012	0.949	0.021	0.910	0.011	0.955	0.000	0.998
NEG_ROA	0.014	0.943	0.052	0.794	0.074	0.709	0.047	0.812	0.049	0.803	0.062	0.753
MB	0.001	0.081	0.001	0.076	0.001	0.071	0.001	0.075	0.001	0.078	0.001	0.071
MERACQS	0.019	0.924	0.045	0.819	0.024	0.901	0.050	0.798	0.053	0.786	0.035	0.859
BIG4	0.921	<0.001	0.941	<0.001	0.923	<0.001	0.935	<0.001	0.985	<0.001	0.943	<0.001
INITIAL	-0.456	0.008	-0.455	0.008	-0.468	0.006	-0.454	0.008	-0.456	0.008	-0.459	0.007
BDINDP	-0.592	0.024	-0.578	0.027	-0.623	0.017	-0.576	0.028	-0.583	0.026	-0.604	0.021
ACSIZE	0.207	0.002	0.218	0.001	0.213	0.001	0.222	0.001	0.232	<0.001	0.221	0.001
INDEPAC	0.536	0.001	0.574	<0.001	0.580	<0.001	0.576	<0.001	0.571	0.001	0.536	0.001
$YEAR_1$	0.631	<0.001	0.662	<0.001	0.644	<0.001	0.657	<0.001	0.650	<0.001	0.649	<0.001
$YEAR_2$	0.373	0.034	0.383	0.029	0.360	0.040	0.379	0.031	0.379	0.030	0.364	0.037
n		2,779		2,779		2,779		2,779		2,779		2,779
Adjusted R^2		0.297		0.295		0.298		0.295		0.297		0.301

Table 2
Sensitivity analysis for audit firm tenure (AFTENURE)

Pane A: AFTENURE after clustering and including year dummies

Variables	H2a		H2b		H2c		H2d		H2e		H2f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-4.968	<0.001	-4.354	<0.001	-4.949	<0.001	-5.312	<0.001	-4.633	<0.001	-4.911	<0.001
DLKS	-0.006	0.814										
DAFLKS			0.220	0.003								
DAPLKS					0.165	0.195						
ACLKS							-0.104	0.094				
ACAFLKS									0.226	0.124		
ACAPLKS											-0.147	0.592
UXAF	0.335	0.017	0.341	0.015	0.356	0.012	0.345	0.014	0.337	0.017	0.325	0.022
LEVERAGE	-0.004	0.517	-0.005	0.394	-0.004	0.476	-0.004	0.537	-0.004	0.477	-0.004	0.503
PQUAL	-0.483	0.074	-0.468	0.083	-0.469	0.083	-0.483	0.074	-0.490	0.070	-0.478	0.078
LnTA	0.173	0.004	0.132	0.026	0.167	0.004	0.194	0.001	0.153	0.009	0.169	0.003
BIG4	2.247	<0.001	2.148	<0.001	2.253	<0.001	2.258	<0.001	2.204	<0.001	2.247	<0.001
LnAGE	4.364	<0.001	4.356	<0.001	4.359	<0.001	4.364	<0.001	4.368	<0.001	4.361	<0.001
G_TA	-0.013	0.070	-0.014	0.056	-0.013	0.066	-0.013	0.067	-0.013	0.071	-0.013	0.069
LOSS	-0.349	0.144	-0.395	0.097	-0.364	0.127	-0.353	0.138	-0.364	0.127	-0.355	0.136
UXAPNAS	0.024	0.331	0.024	0.343	0.024	0.337	0.023	0.354	0.026	0.304	0.024	0.345
AA	-6.946	<0.001	-6.960	<0.001	-6.945	<0.001	-6.960	<0.001	-6.933	<0.001	-6.948	<0.001
BDINDP	0.082	0.789	0.069	0.822	0.088	0.772	0.087	0.775	0.078	0.799	0.075	0.807
ACSIZE	-0.112	0.135	-0.108	0.147	-0.106	0.159	-0.081	0.290	-0.129	0.088	-0.107	0.155
INDEPAC	-0.135	0.559	-0.141	0.539	-0.134	0.560	-0.107	0.642	-0.140	0.543	-0.139	0.548
$YEAR_1$	0.116	0.614	0.089	0.701	0.114	0.622	0.092	0.692	0.125	0.588	0.110	0.633
$YEAR_2$	0.216	0.346	0.203	0.375	0.218	0.341	0.193	0.401	0.220	0.338	0.212	0.356
n		3,821		3,821		3,821		3,821		3,821		3,821
Adjusted R^2		0.338		0.339		0.338		0.338		0.338		0.338

Panel B: AFTENURE excluding Arthur Anderson variable and sample companies

Variables	H2a		H2b		H2c		H2d		H2e		H2f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-5.447	<0.001	-4.814	<0.001	-5.489	<0.001	-5.898	<0.001	-5.153	<0.001	-5.444	<0.001
DLKS	0.000	0.993										
DAFLKS			0.249	0.001								
DAPLKS					0.164	0.213						
ACLKS							-0.113	0.082				
ACAFLKS									0.235	0.130		
ACAPLKS											-0.137	0.633
UXAF	0.354	0.017	0.359	0.015	0.377	0.011	0.371	0.012	0.355	0.016	0.346	0.020
LEVERAGE	-0.004	0.523	-0.005	0.404	-0.004	0.499	-0.003	0.559	-0.004	0.497	-0.004	0.522
PQUAL	-0.492	0.083	-0.475	0.093	-0.479	0.091	-0.493	0.082	-0.500	0.077	-0.487	0.086
LnTA	0.185	0.004	0.142	0.023	0.183	0.003	0.214	0.001	0.168	0.007	0.186	0.002
BIG4	2.271	<0.001	2.162	<0.001	2.279	<0.001	2.284	<0.001	2.229	<0.001	2.273	<0.001
LnAGE	4.494	<0.001	4.488	<0.001	4.490	<0.001	4.495	<0.001	4.499	<0.001	4.493	<0.001
G_TA	-0.013	0.071	-0.014	0.056	-0.014	0.068	-0.013	0.069	-0.013	0.073	-0.013	0.072
LOSS	-0.399	0.112	-0.448	0.074	-0.408	0.103	-0.396	0.113	-0.410	0.102	-0.400	0.110
UXAPNAS	0.028	0.285	0.028	0.294	0.028	0.290	0.027	0.309	0.029	0.262	0.028	0.293
BDINDP	0.057	0.858	0.051	0.873	0.069	0.829	0.064	0.842	0.059	0.853	0.053	0.868
ACSIZE	-0.121	0.125	-0.115	0.145	-0.115	0.146	-0.090	0.269	-0.138	0.083	-0.117	0.140
INDEPAC	-0.129	0.596	-0.139	0.567	-0.127	0.602	-0.094	0.701	-0.137	0.575	-0.129	0.596
$YEAR_1$	0.161	0.507	0.133	0.582	0.161	0.504	0.138	0.569	0.171	0.478	0.158	0.512
$YEAR_2$	0.240	0.319	0.225	0.347	0.244	0.310	0.216	0.370	0.244	0.309	0.236	0.326
n		3,614		3,614		3,614		3,614		3,614		3,614
Adjusted R^2		0.330		0.332		0.330		0.330		0.330		0.330

Panel C: AFTENURE for audit committees sample companies

Variables	H2a		H2b		H2c		H2d		H2e		H2f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-6.741	<0.001	-5.630	<0.001	-6.252	<0.001	-6.779	<0.001	-5.896	<0.001	-6.278	<0.001
DLKS	-0.036	0.241										
DAFLKS			0.188	0.026								
DAPLKS					0.205	0.208						
ACLKS							-0.107	0.088				
ACAFLKS									0.255	0.087		
ACAPLKS											-0.018	0.948
UXAF	0.359	0.029	0.365	0.026	0.387	0.020	0.358	0.029	0.365	0.026	0.350	0.035
LEVERAGE	-0.027	0.634	-0.036	0.527	-0.032	0.566	-0.025	0.658	-0.036	0.519	-0.029	0.608
PQUAL	-0.076	0.827	-0.080	0.817	-0.070	0.839	-0.082	0.814	-0.076	0.826	-0.072	0.837
LnTA	0.242	0.001	0.175	0.011	0.207	0.002	0.245	<0.001	0.191	0.005	0.213	0.001
BIG4	2.033	<0.001	1.930	<0.001	2.029	<0.001	2.037	<0.001	1.960	<0.001	2.022	<0.001
LnAGE	4.327	<0.001	4.319	<0.001	4.319	<0.001	4.320	<0.001	4.329	<0.001	4.320	<0.001
G_TA	-0.015	0.050	-0.016	0.037	-0.015	0.043	-0.015	0.045	-0.015	0.048	-0.015	0.046
LOSS	-0.487	0.073	-0.563	0.037	-0.537	0.047	-0.513	0.057	-0.540	0.045	-0.521	0.054
UXAPNAS	0.036	0.256	0.036	0.254	0.036	0.252	0.034	0.284	0.037	0.234	0.035	0.267
AA	-6.878	<0.001	-6.865	<0.001	-6.860	<0.001	-6.883	<0.001	-6.835	<0.001	-6.858	<0.001
BDINDP	0.073	0.858	0.079	0.848	0.097	0.813	0.074	0.858	0.074	0.856	0.066	0.872
ACSIZE	0.092	0.379	0.074	0.479	0.088	0.397	0.112	0.287	0.069	0.507	0.086	0.410
INDEPAC	0.171	0.511	0.112	0.667	0.133	0.607	0.164	0.528	0.141	0.586	0.139	0.591
$YEAR_1$	0.144	0.593	0.119	0.659	0.137	0.612	0.100	0.711	0.143	0.597	0.127	0.637
$YEAR_2$	0.184	0.490	0.180	0.499	0.192	0.472	0.153	0.566	0.186	0.485	0.181	0.497
n		2,779		2,779		2,779		2,779		2,779		2,779
Adjusted R^2		0.349		0.350		0.349		0.349		0.349		0.349

Table 3
Sensitivity analysis for OPINION (OPINION)

Panel A: OPINION after clustering and including year dummies

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.777	0.366	0.954	0.266	1.131	0.188	0.831	0.336	0.863	0.314	0.964	0.261
DLKS	-0.043	0.020										
DAFLKS			-0.162	0.004								
DAPLKS					-0.345	<0.001						
ACLKS							-0.046	0.356				
ACAFLKS									-0.182	0.146		
ACAPLKS											-0.531	0.006
LnTA	-0.267	<0.001	-0.280	<0.001	-0.287	<0.001	-0.273	<0.001	-0.276	<0.001	-0.282	<0.001
BIG4	-0.338	0.008	-0.287	0.027	-0.383	0.003	-0.344	0.007	-0.330	0.010	-0.360	0.005
UXAF	0.169	0.083	0.164	0.092	0.155	0.111	0.171	0.078	0.172	0.077	0.178	0.068
UXAPNAS	-0.029	0.046	-0.029	0.049	-0.031	0.036	-0.030	0.038	-0.031	0.036	-0.033	0.024
LEVERAGE	-0.018	0.179	-0.019	0.159	-0.018	0.164	-0.018	0.167	-0.018	0.183	-0.017	0.199
LOSS	0.854	<0.001	0.854	<0.001	0.860	<0.001	0.835	<0.001	0.841	<0.001	0.841	<0.001
ROA	-0.437	0.001	-0.421	0.001	-0.434	0.001	-0.421	0.001	-0.420	0.001	-0.424	0.001
SQRSUBS	0.108	<0.001	0.111	<0.001	0.107	0.001	0.105	0.001	0.106	0.001	0.102	0.001
LnAGE	0.226	0.008	0.220	0.010	0.232	0.007	0.219	0.010	0.216	0.011	0.223	0.009
INDEPAC	0.000	0.998	-0.014	0.925	-0.025	0.863	-0.002	0.990	-0.007	0.963	-0.006	0.969
PQUAL	3.016	<0.001	3.010	<0.001	3.013	<0.001	3.026	<0.001	3.028	<0.001	3.045	<0.001
AFTENURE	0.005	0.645	0.007	0.515	0.007	0.525	0.005	0.641	0.006	0.578	0.007	0.561
INITIAL	0.223	0.152	0.247	0.114	0.225	0.150	0.218	0.160	0.224	0.150	0.218	0.163
BDINDP	-0.055	0.753	-0.075	0.664	-0.086	0.624	-0.080	0.643	-0.087	0.616	-0.102	0.556
ACSIZE	0.039	0.405	0.042	0.371	0.029	0.544	0.053	0.281	0.052	0.274	0.055	0.247
$YEAR_1$	0.062	0.667	0.055	0.703	0.046	0.748	0.034	0.813	0.037	0.795	0.047	0.747
$YEAR_2$	-0.259	0.081	-0.258	0.082	-0.279	0.061	-0.277	0.061	-0.269	0.070	-0.272	0.066
n		3,821		3,821		3,821		3,821		3,821		3,821
LR χ^2 (14)		1495.636		1498.594		1505.231		1490.929		1492.231		1497.846
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-2011.707		-2008.749		-2002.112		-2016.414		-2015.112		-2009.497
Pseudo R^2		0.539		0.540		0.542		0.538		0.538		0.540

Panel B: OPINION after redefining opinion

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.187	0.823	0.312	0.709	0.402	0.631	0.285	0.734	0.277	0.739	0.318	0.703
DLKS	-0.036	0.046										
DAFLKS			-0.103	0.065								
DAPLKS					-0.189	0.031						
ACLKS							-0.008	0.870				
ACAFLKS									-0.061	0.604		
ACAPLKS											-0.275	0.067
LnTA	-0.248	<0.001	-0.258	<0.001	-0.261	<0.001	-0.257	<0.001	-0.257	<0.001	-0.259	<0.001
BIG4	-0.353	0.005	-0.322	0.012	-0.379	0.003	-0.360	0.005	-0.355	0.005	-0.367	0.004
UXAF	0.156	0.100	0.153	0.108	0.148	0.120	0.157	0.099	0.157	0.097	0.160	0.091
UXAPNAS	-0.019	0.176	-0.019	0.177	-0.020	0.154	-0.020	0.158	-0.020	0.154	-0.022	0.130
LEVERAGE	-0.025	0.039	-0.025	0.032	-0.025	0.033	-0.026	0.032	-0.025	0.034	-0.025	0.035
LOSS	0.922	<0.001	0.918	<0.001	0.922	<0.001	0.912	<0.001	0.913	<0.001	0.913	<0.001
ROA	-0.299	0.004	-0.290	0.004	-0.299	0.003	-0.287	0.005	-0.287	0.005	-0.287	0.005
SQRSUBS	0.095	0.002	0.095	0.003	0.092	0.004	0.092	0.004	0.092	0.004	0.090	0.005
LnAGE	0.225	0.007	0.219	0.009	0.226	0.007	0.217	0.010	0.216	0.010	0.220	0.009
INDEPAC	0.053	0.705	0.043	0.760	0.038	0.786	0.045	0.748	0.046	0.746	0.048	0.734
PQUAL	2.452	<0.001	2.450	<0.001	2.447	<0.001	2.467	<0.001	2.465	<0.001	2.470	<0.001
AFTENURE	-0.009	0.443	-0.007	0.524	-0.008	0.507	-0.008	0.466	-0.008	0.487	-0.008	0.508
INITIAL	0.248	0.103	0.263	0.085	0.249	0.103	0.247	0.104	0.249	0.101	0.247	0.104
BDINDP	-0.164	0.334	-0.182	0.281	-0.189	0.264	-0.186	0.270	-0.188	0.265	-0.197	0.244
ACSIZE	0.099	0.031	0.102	0.027	0.095	0.040	0.103	0.032	0.105	0.025	0.109	0.019
$YEAR_1$	0.072	0.613	0.060	0.671	0.053	0.707	0.052	0.715	0.052	0.712	0.057	0.687
$YEAR_2$	-0.187	0.199	-0.192	0.187	-0.205	0.160	-0.200	0.170	-0.198	0.175	-0.199	0.173
n		3,821		3,821		3,821		3,821		3,821		3,821
LR χ^2 (14)		1066.610		1066.058		1067.546		1062.552		1062.799		1064.867
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-2039.211		-2039.762		-2038.274		-2043.268		-2043.021		-2040.953
Pseudo R^2		0.538		0.538		0.538		0.536		0.536		0.537

Panel C: OPINION including ABSDACC as control variable

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-1.179	0.243	-1.033	0.305	-0.845	0.402	-1.209	0.233	-1.082	0.282	-1.029	0.307
DLKS	-0.035	0.095										
DAFLKS			-0.124	0.055								
DAPLKS					-0.325	0.002						
ACLKS							-0.086	0.157				
ACAFLKS									-0.096	0.517		
ACAPLKS											-0.709	0.001
LnTA	-0.223	<0.001	-0.234	<0.001	-0.243	<0.001	-0.223	<0.001	-0.233	<0.001	-0.240	<0.001
BIG4	-0.303	0.039	-0.267	0.071	-0.344	0.019	-0.307	0.036	-0.303	0.039	-0.329	0.025
UXAF	0.031	0.809	0.023	0.854	0.014	0.915	0.035	0.782	0.031	0.806	0.039	0.759
UXAPNAS	-0.037	0.029	-0.036	0.033	-0.037	0.030	-0.037	0.026	-0.037	0.026	-0.041	0.015
LEVERAGE	0.913	<0.001	0.922	<0.001	0.913	<0.001	0.946	<0.001	0.950	<0.001	0.984	<0.001
LOSS	1.941	<0.001	1.940	<0.001	1.962	<0.001	1.922	<0.001	1.926	<0.001	1.954	<0.001
ROA	-0.257	0.163	-0.244	0.176	-0.245	0.161	-0.236	0.194	-0.231	0.200	-0.226	0.212
SQRSUBS	0.243	0.016	0.242	0.017	0.254	0.013	0.237	0.019	0.237	0.019	0.250	0.014
LnAGE	0.113	0.632	0.107	0.651	0.105	0.659	0.135	0.569	0.123	0.605	0.172	0.471
INDEPAC	2.960	<0.001	2.955	<0.001	2.962	<0.001	2.960	<0.001	2.968	<0.001	2.993	<0.001
PQUAL	0.002	0.900	0.003	0.821	0.004	0.764	0.001	0.912	0.002	0.876	0.004	0.761
AFTENURE	0.142	0.427	0.152	0.397	0.135	0.452	0.131	0.464	0.132	0.460	0.135	0.452
INITIAL	0.085	0.041	0.086	0.044	0.082	0.057	0.082	0.049	0.082	0.054	0.077	0.073
BDINDP	-0.212	0.287	-0.235	0.237	-0.249	0.214	-0.227	0.251	-0.234	0.237	-0.257	0.197
ACSIZE	0.029	0.714	0.031	0.693	0.018	0.823	0.048	0.550	0.032	0.691	0.032	0.691
ABSDACC	1.602	0.233	1.567	0.240	1.602	0.230	1.566	0.242	1.503	0.260	1.763	0.187
$YEAR_1$	-0.138	0.413	-0.151	0.371	-0.159	0.346	-0.167	0.323	-0.159	0.345	-0.151	0.373
$YEAR_2$	-0.557	0.002	-0.564	0.002	-0.586	0.001	-0.574	0.001	-0.564	0.002	-0.568	0.001
n		2,815		2,815		2,815		2,815		2,815		2,815
LR χ^2 (14)		1197.541		1198.533		1205.100		1196.763		1195.119		1204.512
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-1514.048		-1513.055		-1506.488		-1514.826		-1516.470		-1507.077
Pseudo R^2		0.560		0.561		0.563		0.560		0.559		0.563

Panel D: OPINION and interaction between ABSDACC and INTERLOCKINGS

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-1.161	0.251	-1.024	0.310	-0.739	0.465	-1.202	0.236	-1.085	0.281	-0.989	0.327
DLKS	-0.050	0.065										
DAFLKS			-0.168	0.048								
DAPLKS					-0.518	0.001						
ACLKS							-0.103	0.195				
ACAFLKS									-0.126	0.517		
ACAPLKS											-1.054	0.003
LnTA	-0.222	<0.001	-0.233	<0.001	-0.247	<0.001	-0.223	<0.001	-0.232	<0.001	-0.242	<0.001
BIG4	-0.305	0.037	-0.265	0.074	-0.325	0.027	-0.303	0.039	-0.299	0.042	-0.315	0.032
UXAF	0.038	0.765	0.025	0.841	0.017	0.897	0.034	0.787	0.030	0.814	0.039	0.758
UXAPNAS	-0.037	0.029	-0.036	0.032	-0.036	0.031	-0.037	0.027	-0.037	0.027	-0.041	0.016
LEVERAGE	0.915	<0.001	0.924	<0.001	0.925	<0.001	0.945	<0.001	0.950	<0.001	0.982	<0.001
LOSS	1.944	<0.001	1.945	<0.001	1.976	<0.001	1.920	<0.001	1.925	<0.001	1.960	<0.001
ROA	-0.249	0.178	-0.232	0.205	-0.207	0.262	-0.237	0.190	-0.232	0.199	-0.225	0.213
SQRSUBS	0.240	0.018	0.237	0.020	0.246	0.016	0.235	0.020	0.237	0.020	0.251	0.014
LnAGE	0.112	0.636	0.106	0.655	0.096	0.685	0.133	0.573	0.123	0.604	0.169	0.480
INDEPAC	2.967	<0.001	2.958	<0.001	2.969	<0.001	2.961	<0.001	2.968	<0.001	2.993	<0.001
PQUAL	0.002	0.892	0.003	0.801	0.004	0.761	0.001	0.909	0.002	0.876	0.004	0.787
AFTENURE	0.145	0.418	0.153	0.392	0.143	0.427	0.133	0.458	0.133	0.456	0.141	0.433
INITIAL	0.086	0.038	0.087	0.041	0.083	0.051	0.083	0.047	0.082	0.053	0.078	0.070
BDINDP	-0.205	0.304	-0.232	0.243	-0.252	0.207	-0.225	0.256	-0.233	0.239	-0.260	0.191
ACSIZE	0.029	0.709	0.032	0.685	0.018	0.821	0.047	0.557	0.031	0.693	0.033	0.676
ABSDACC	0.570	0.746	1.056	0.475	0.729	0.608	1.334	0.378	1.415	0.306	1.394	0.308
$YEAR_1$	-0.137	0.416	-0.152	0.369	-0.147	0.385	-0.168	0.320	-0.159	0.346	-0.152	0.369
$YEAR_2$	-0.553	0.002	-0.563	0.002	-0.584	0.001	-0.575	0.001	-0.564	0.002	-0.570	0.001
DACC*INTERLOCKINGS	0.292	0.360	0.779	0.414	3.134	0.060	0.352	0.742	0.542	0.812	3.394	0.213
n		2,815		2,815		2,815		2,815		2,815		2,815
LR χ^2 (14)		1198.319		1199.180		1208.530		1196.870		1195.176		1206.188
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-1513.270		-1512.409		-1503.058		-1514.718		-1516.413		-1505.401
Pseudo R^2		0.561		0.561		0.564		0.560		0.559		0.564

Panel E: OPINION and interaction between APNAS and INTERLOCKINGS and AFTENURE and INTERLOCKINGS

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-1.095	0.275	-0.808	0.417	-0.672	0.501	-0.976	0.330	-0.830	0.404	-0.638	0.528
DLKS	-0.008	0.789										
DAFLKS			-0.071	0.473								
DAPLKS					-0.192	0.270						
ACLKS							-0.094	0.302				
ACAFLKS									-0.105	0.679		
ACAPLKS											-0.900	0.346
LnTA	-0.233	<0.001	-0.248	<0.001	-0.257	<0.001	-0.239	<0.001	-0.246	<0.001	-0.262	<0.001
BIG4	-0.308	0.035	-0.272	0.066	-0.349	0.018	-0.304	0.037	-0.301	0.040	-0.329	0.027
UXAF	0.033	0.797	0.027	0.834	0.020	0.874	0.036	0.777	0.028	0.828	0.035	0.789
LnAPNAS	-0.039	0.025	-0.037	0.029	-0.041	0.018	-0.040	0.020	-0.038	0.025	-0.038	0.029
LEVERAGE	0.957	<0.001	0.966	<0.001	0.988	<0.001	0.985	<0.001	0.991	<0.001	1.069	<0.001
LOSS	1.942	<0.001	1.929	<0.001	1.952	<0.001	1.923	<0.001	1.918	<0.001	1.929	<0.001
ROA	-0.297	0.113	-0.270	0.136	-0.275	0.125	-0.260	0.154	-0.261	0.153	-0.256	0.166
SQRSUBS	0.247	0.014	0.245	0.015	0.257	0.012	0.243	0.016	0.242	0.017	0.274	0.008
LnAGE	0.100	0.672	0.109	0.645	0.115	0.628	0.145	0.543	0.124	0.603	0.139	0.565
INDEPAC	2.975	<0.001	2.968	<0.001	2.983	<0.001	2.982	<0.001	2.989	<0.001	3.021	<0.001
PQUAL	0.015	0.373	0.008	0.579	0.010	0.480	0.003	0.825	0.002	0.900	0.003	0.843
AFTENURE	0.147	0.411	0.164	0.359	0.148	0.410	0.142	0.428	0.141	0.429	0.177	0.329
INITIAL	0.087	0.037	0.084	0.050	0.079	0.069	0.080	0.057	0.080	0.061	0.072	0.108
BDINDP	-0.183	0.359	-0.215	0.280	-0.214	0.287	-0.213	0.285	-0.218	0.271	-0.300	0.139
ACSIZE	0.025	0.753	0.026	0.743	0.012	0.881	0.044	0.580	0.026	0.741	0.047	0.562
LnAPNAS*INTERLOCKING	0.002	0.624	0.007	0.641	0.031	0.272	0.011	0.276	0.014	0.622	0.012	0.909
AFTENURE*INTERLOCKING	-0.005	0.194	-0.008	0.386	-0.022	0.178	-0.004	0.630	-0.003	0.877	0.066	0.407
$YEAR_1$	-0.112	0.557	-0.138	0.437	-0.125	0.469	-0.118	0.509	-0.155	0.367	-0.123	0.477
$YEAR_2$	-0.537	0.007	-0.563	0.002	-0.564	0.002	-0.541	0.004	-0.572	0.002	-0.579	0.001
n		3,821		3,821		3,821		3,821		3,821		3,821
LR χ^2 (14)		1224.297		1224.191		1232.726		1222.820		1219.889		1208.696
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-1520.084		-1520.190		-1511.655		-1521.561		-1524.083		-1472.773
Pseudo R^2		0.564		0.564		0.567		0.564		0.563		0.569

Panel F: OPINION excluding financial industries

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.943	0.308	1.124	0.223	1.316	0.155	0.920	0.322	1.027	0.266		
DLKS	-0.053	0.007										
DAFLKS			-0.147	0.013								
DAPLKS					-0.332	0.001						
ACLKS							-0.098	0.082				
ACAFLKS									-0.133	0.309		
ACAPLKS											-0.500	0.012
LnTA	-0.280	<0.001	-0.295	<0.001	-0.304	<0.001	-0.281	<0.001	-0.290	<0.001	-0.295	<0.001
BIG4	-0.272	0.042	-0.234	0.083	-0.322	0.017	-0.277	0.038	-0.274	0.041	-0.301	0.025
UXAF	0.215	0.040	0.207	0.049	0.200	0.056	0.218	0.037	0.212	0.042	0.221	0.035
UXAPNAS	-0.027	0.073	-0.027	0.080	-0.028	0.066	-0.029	0.061	-0.028	0.063	-0.031	0.045
LEVERAGE	-0.023	0.076	-0.024	0.068	-0.024	0.070	-0.023	0.081	-0.023	0.078	-0.023	0.089
LOSS	1.019	<0.001	1.021	<0.001	1.031	<0.001	0.993	<0.001	1.005	<0.001	1.005	<0.001
ROA	-0.443	0.001	-0.423	0.001	-0.436	0.001	-0.427	0.001	-0.424	0.001	-0.428	0.001
SQRSUBS	0.112	0.001	0.113	0.001	0.109	0.001	0.107	0.001	0.108	0.001	0.104	0.002
LnAGE	0.189	0.036	0.184	0.042	0.196	0.031	0.178	0.048	0.181	0.045	0.189	0.037
INDEPAC	-0.041	0.785	-0.057	0.702	-0.068	0.652	-0.035	0.817	-0.055	0.714	-0.053	0.725
PQUAL	2.926	<0.001	2.927	<0.001	2.926	<0.001	2.933	<0.001	2.942	<0.001	2.961	<0.001
AFTENURE	0.009	0.442	0.011	0.348	0.012	0.321	0.009	0.434	0.010	0.404	0.011	0.376
INITIAL	0.223	0.173	0.240	0.143	0.219	0.181	0.214	0.190	0.215	0.187	0.210	0.199
BDINDP	-0.042	0.819	-0.073	0.688	-0.084	0.644	-0.070	0.698	-0.079	0.662	-0.093	0.608
ACSIZE	0.056	0.255	0.060	0.218	0.047	0.340	0.083	0.101	0.067	0.177	0.072	0.145
$YEAR_1$	0.086	0.567	0.072	0.632	0.066	0.659	0.046	0.757	0.059	0.696	0.068	0.649
$YEAR_2$	-0.306	0.050	-0.312	0.045	-0.331	0.034	-0.335	0.031	-0.322	0.038	-0.324	0.037
n		3,156		3,156		3,156		3,156		3,156		3,156
LR χ^2 (14)		1277.473		1276.365		1283.031		1273.046		1270.926		1276.124
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-1809.927		-1811.036		-1804.370		-1814.354		-1816.474		-1811.276
Pseudo R^2		0.533		0.533		0.535		0.532		0.531		0.533

Panel G: OPINION for the companies which had audit committees

Variables	H3a		H3b		H3c		H3d		H3e		H3f	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.753	0.511	0.971	0.391	1.119	0.325	0.881	0.443	0.916	0.420	1.065	0.349
DLKS	-0.033	0.139										
DAFLKS			-0.086	0.221								
DAPLKS					-0.472	0.002						
ACLKS							-0.038	0.467				
ACAFLKS									-0.167	0.206		
ACAPLKS											-0.609	0.003
LnTA	-0.297	<0.001	-0.312	<0.001	-0.316	<0.001	-0.304	<0.001	-0.307	<0.001	-0.313	<0.001
BIG4	-0.251	0.130	-0.213	0.207	-0.294	0.078	-0.256	0.122	-0.233	0.162	-0.278	0.095
UXAF	0.079	0.538	0.076	0.554	0.065	0.613	0.080	0.528	0.080	0.533	0.090	0.481
UXAPNAS	-0.036	0.066	-0.036	0.061	-0.042	0.032	-0.037	0.055	-0.038	0.052	-0.043	0.030
LEVERAGE	-0.053	0.141	-0.052	0.126	-0.047	0.127	-0.053	0.128	-0.050	0.139	-0.044	0.135
LOSS	0.772	<0.001	0.763	<0.001	0.781	<0.001	0.753	<0.001	0.760	<0.001	0.751	<0.001
ROA	-0.783	0.001	-0.750	0.002	-0.779	0.001	-0.761	0.002	-0.761	0.002	-0.794	0.001
SQRSUBS	0.099	0.014	0.100	0.015	0.099	0.016	0.097	0.018	0.097	0.018	0.092	0.027
LnAGE	0.272	0.015	0.260	0.019	0.274	0.015	0.263	0.018	0.257	0.021	0.270	0.016
INDEPAC	-0.189	0.267	-0.199	0.242	-0.207	0.223	-0.202	0.233	-0.204	0.228	-0.219	0.197
PQUAL	3.149	<0.001	3.154	<0.001	3.166	<0.001	3.155	<0.001	3.153	<0.001	3.181	<0.001
AFTENURE	0.007	0.646	0.009	0.573	0.010	0.516	0.007	0.629	0.009	0.558	0.010	0.502
INITIAL	0.019	0.926	0.026	0.898	0.018	0.928	0.010	0.962	0.017	0.933	0.005	0.981
BDINDP	0.437	0.097	0.416	0.113	0.399	0.133	0.423	0.106	0.413	0.115	0.392	0.137
ACSIZE	-0.016	0.839	-0.014	0.856	-0.028	0.718	-0.013	0.872	-0.012	0.876	-0.024	0.756
$YEAR_1$	0.130	0.488	0.118	0.531	0.107	0.568	0.108	0.565	0.111	0.555	0.126	0.502
$YEAR_2$	-0.127	0.501	-0.126	0.504	-0.147	0.441	-0.140	0.461	-0.130	0.494	-0.133	0.485
n		2,779		2,779		2,779		2,779		2,779		2,779
LR χ^2 (14)		1015.314		1014.639		1023.997		1013.636		1014.737		1022.035
Prob > χ^2		0.000		0.000		0.000		0.000		0.000		0.000
Log likelihood		-1231.624		-1232.296		-1222.939		-1233.299		-1232.198		-1224.900
Pseudo R^2		0.552		0.552		0.556		0.551		0.552		0.555

Table 4
Sensitivity analysis for discretionary accruals (DACC)

Panel A: Absolute value of discretionary accruals without winsorising discretionary accruals

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.127	<0.001	0.118	<0.001	0.117	<0.001	0.117	<0.001	0.117	<0.001	0.117	<0.001
DLKS	0.001	0.011										
DAFLKS			0.000	0.707								
DAPLKS					0.001	0.709						
ACLKS							0.000	0.997				
ACAFLKS									0.000	0.862		
ACAPLKS											0.117	0.126
BIG4	0.001	0.696	0.001	0.654	0.002	0.595	0.002	0.614	0.002	0.626	0.002	0.567
EQUITY	0.007	0.032	0.008	0.022	0.008	0.022	0.008	0.022	0.008	0.022	0.008	0.024
MERACQS	-0.004	0.266	-0.004	0.327	-0.004	0.332	-0.004	0.334	-0.004	0.332	-0.004	0.352
LEVERAGE	0.023	<0.001	0.022	<0.001	0.022	<0.001	0.022	<0.001	0.022	<0.001	0.022	<0.001
LnMVE	-0.006	<0.001	-0.005	<0.001	-0.005	<0.001	-0.005	<0.001	-0.005	<0.001	-0.005	<0.001
MB	0.000	0.110	0.000	0.118	0.000	0.118	0.000	0.118	0.000	0.118	0.000	0.116
CASHFLOW	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001
LOSS	0.006	0.127	0.006	0.096	0.006	0.096	0.007	0.090	0.007	0.091	0.006	0.109
LTACC	-0.102	<0.001	-0.103	<0.001	-0.103	<0.001	-0.103	<0.001	-0.103	<0.001	-0.102	<0.001
AFTENURE	0.000	0.724	0.000	0.747	0.000	0.745	0.000	0.766	0.000	0.761	0.000	0.728
UXAF	0.004	0.156	0.004	0.157	0.004	0.156	0.004	0.159	0.004	0.160	0.004	0.166
UXAPNAS	0.000	0.731	0.000	0.701	0.000	0.700	0.000	0.695	0.000	0.694	0.000	0.660
BDINDP	0.007	0.131	0.008	0.098	0.008	0.096	0.008	0.098	0.008	0.098	0.008	0.088
ACSIZE	-0.004	0.016	-0.004	0.017	-0.004	0.018	-0.004	0.019	-0.004	0.017	-0.004	0.016
INDEPAC	0.001	0.864	0.001	0.895	0.001	0.898	0.001	0.903	0.001	0.905	0.000	0.964
$YEAR_1$	-0.007	0.049	-0.007	0.077	-0.007	0.079	-0.007	0.078	-0.007	0.079	-0.006	0.082
$YEAR_2$	-0.007	0.070	-0.006	0.076	-0.006	0.078	-0.006	0.077	-0.006	0.077	-0.006	0.086
n		2,817		2,817		2,817		2,817		2,817		2,817
Adjusted R^2		0.081		0.079		0.079		0.079		0.079		0.080

Panel B: Absolute value of discretionary accruals after excluding observations of DACC ≥ 3σ

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.099	<0.001	0.098	<0.001	0.094	<0.001	0.094	<0.001	0.095	<0.001	0.096	<0.001
DLKS	0.000	0.045										
DAFLKS			0.001	0.091								
DAPLKS					0.002	0.153						
ACLKS							0.000	0.731				
ACAFLKS									0.000	0.876		
ACAPLKS											0.005	0.069
BIG4	0.001	0.457	0.001	0.553	0.002	0.346	0.002	0.395	0.001	0.413	0.002	0.366
EQUITY	0.005	0.004	0.006	0.002	0.006	0.002	0.006	0.002	0.006	0.002	0.005	0.003
MERACQS	-0.002	0.379	-0.002	0.412	-0.002	0.444	-0.002	0.462	-0.002	0.447	-0.001	0.474
LEVERAGE	0.008	0.004	0.008	0.004	0.008	0.003	0.008	0.004	0.007	0.005	0.007	0.006
LnMVE	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
MB	0.000	0.824	0.000	0.833	0.000	0.835	0.000	0.843	0.000	0.837	0.000	0.823
CASHFLOW	-0.002	0.001	-0.002	0.001	-0.002	0.001	-0.002	0.001	-0.002	0.001	-0.002	0.001
LOSS	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001
LTACC	-0.036	<0.001	-0.035	<0.001	-0.036	<0.001	-0.036	<0.001	-0.036	<0.001	-0.036	<0.001
AFTENURE	0.000	0.491	0.000	0.447	0.000	0.448	0.000	0.512	0.000	0.515	0.000	0.491
UXAF	0.001	0.710	0.001	0.689	0.001	0.679	0.001	0.698	0.001	0.715	0.000	0.749
UXAPNAS	0.000	0.451	0.000	0.450	0.000	0.443	0.000	0.427	0.000	0.432	0.000	0.413
BDINDP	-0.001	0.817	-0.001	0.775	-0.001	0.743	-0.001	0.782	-0.001	0.779	-0.001	0.758
ACSIZE	-0.001	0.396	-0.001	0.395	-0.001	0.380	-0.001	0.404	-0.001	0.435	-0.001	0.410
INDEPAC	-0.002	0.674	-0.001	0.679	-0.001	0.694	-0.001	0.679	-0.001	0.693	-0.001	0.715
$YEAR_1$	-0.004	0.284	-0.004	0.234	-0.004	0.305	-0.004	0.297	-0.004	0.296	-0.004	0.302
$YEAR_2$	-0.009	0.011	-0.009	0.011	-0.009	0.013	-0.009	0.012	-0.009	0.011	-0.009	0.012
n		2,758		2,758		2,758		2,758		2,758		2,758
Adjusted R^2		0.087		0.086		0.086		0.085		0.085		0.086

Panel C: Absolute value of discretionary accruals after excluding DACC ≥ 3σ and winsorising top and bottom 1 per cent

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.085	<0.001	0.084	<0.001	0.082	<0.001	0.084	<0.001	0.084	<0.001	0.083	<0.001
DLKS	0.000	0.181										
DAFLKS			0.001	0.322								
DAPLKS					0.001	0.195						
ACLKS							0.000	0.547				
ACAFLKS									0.001	0.595		
ACAPLKS											0.005	0.056
BIG4	0.001	0.387	0.001	0.439	0.002	0.313	0.001	0.363	0.001	0.384	0.002	0.319
EQUITY	0.005	0.004	0.005	0.003	0.005	0.003	0.005	0.003	0.005	0.003	0.005	0.004
MERACQS	-0.002	0.341	-0.002	0.363	-0.002	0.378	-0.002	0.365	-0.002	0.379	-0.002	0.407
LEVERAGE	0.007	0.004	0.007	0.004	0.007	0.004	0.007	0.005	0.007	0.005	0.007	0.006
LnMVE	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001
MB	0.000	0.939	0.000	0.945	0.000	0.943	0.000	0.946	0.000	0.946	0.000	0.941
CASHFLOW	-0.002	0.004	-0.002	0.004	-0.002	0.004	-0.002	0.004	-0.002	0.004	-0.002	0.004
LOSS	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001	0.009	<0.001
LTACC	-0.029	<0.001	-0.029	<0.001	-0.029	<0.001	-0.029	<0.001	-0.029	<0.001	-0.029	<0.001
AFTENURE	0.000	0.236	0.000	0.222	0.000	0.211	0.000	0.250	0.000	0.240	0.000	0.225
UXAF	0.001	0.279	0.002	0.274	0.002	0.269	0.001	0.285	0.001	0.285	0.001	0.295
UXAPNAS	0.000	0.456	0.000	0.453	0.000	0.455	0.000	0.444	0.000	0.439	0.000	0.413
BDINDP	0.000	0.852	0.000	0.909	0.000	0.945	0.000	0.899	0.000	0.912	0.000	0.963
ACSIZE	-0.003	<0.001	-0.003	<0.001	-0.003	0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001
INDEPAC	0.004	0.161	0.004	0.162	0.004	0.161	0.004	0.176	0.004	0.171	0.003	0.197
$YEAR_1$	-0.003	0.049	-0.003	0.059	-0.003	0.064	-0.003	0.065	-0.003	0.064	-0.003	0.067
$YEAR_2$	-0.007	<0.001	-0.007	<0.001	-0.007	<0.001	-0.007	<0.001	-0.007	<0.001	-0.007	<0.001
n		2,758		2,758		2,758		2,758		2,758		2,758
Adjusted R^2		0.096		0.096		0.096		0.095		0.095		0.096

Panel D: Absolute value of discretionary accruals for the larger companies (above median of LnMVE = 16.8728)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.087	<0.001	0.086	<0.001	0.089	<0.001	0.089	<0.001	0.086	<0.001	0.089	<0.001
DLKS	0.000	0.652										
DAFLKS			-0.001	0.375								
DAPLKS					-0.001	0.542						
ACLKS							0.000	0.927				
ACAFLKS									-0.001	0.281		
ACAPLKS											-0.006	0.132
BIG4	0.003	0.148	0.003	0.118	0.003	0.167	0.003	0.152	0.003	0.119	0.003	0.156
EQUITY	0.004	0.087	0.004	0.093	0.004	0.094	0.004	0.093	0.004	0.101	0.004	0.100
MERACQS	-0.002	0.456	-0.002	0.468	-0.002	0.452	-0.002	0.446	-0.002	0.453	-0.002	0.423
LEVERAGE	0.003	0.508	0.003	0.523	0.002	0.547	0.003	0.524	0.003	0.500	0.003	0.517
LnMVE	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001
MB	0.000	0.165	0.000	0.166	0.000	0.165	0.000	0.161	0.000	0.164	0.000	0.166
CASHFLOW	-0.010	<0.001	-0.010	<0.001	-0.010	<0.001	-0.010	<0.001	-0.010	<0.001	-0.010	<0.001
LOSS	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001
LTACC	0.003	0.786	0.003	0.809	0.003	0.796	0.003	0.788	0.003	0.809	0.003	0.790
AFTENURE	0.000	0.132	0.000	0.147	0.000	0.140	0.000	0.125	0.000	0.135	0.000	0.123
UXAF	0.000	0.990	0.000	0.991	0.000	0.985	0.000	0.983	0.000	0.988	0.000	0.998
UXAPNAS	0.000	0.425	0.000	0.434	0.000	0.423	0.000	0.432	0.000	0.430	0.000	0.441
BDINDP	-0.001	0.817	-0.001	0.775	-0.001	0.743	-0.001	0.782	-0.001	0.779	-0.001	0.758
ACSIZE	-0.001	0.396	-0.001	0.395	-0.001	0.380	-0.001	0.404	-0.001	0.435	-0.001	0.410
INDEPAC	-0.002	0.674	-0.001	0.679	-0.001	0.694	-0.001	0.679	-0.001	0.693	-0.001	0.715
$YEAR_1$	-0.002	0.303	-0.002	0.298	-0.002	0.293	-0.002	0.292	-0.003	0.274	-0.003	0.271
$YEAR_2$	-0.008	0.001	-0.008	0.001	-0.008	0.001	-0.008	0.001	-0.008	<0.001	-0.008	<0.001
n		1,408		1,408		1,408		1,408		1,408		1,408
Adjusted R^2		0.088		0.088		0.088		0.088		0.088		0.089

Panel E: Absolute value of discretionary accruals for the smaller companies (below median of LnMVE = 16.8728)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.083	0.006	0.078	0.009	0.075	0.012	0.082	0.006	0.084	0.005	0.088	0.004
DLKS	0.001	0.007										
DAFLKS			0.003	0.013								
DAPLKS					0.004	0.054						
ACLKS							0.001	0.324				
ACAFLKS									0.006	0.077		
ACAPLKS											0.015	0.002
BIG4	-0.001	0.776	-0.001	0.674	0.000	0.969	-0.001	0.866	-0.001	0.832	0.000	0.914
EQUITY	0.009	0.005	0.010	0.003	0.010	0.003	0.009	0.003	0.009	0.004	0.009	0.005
MERACQS	-0.003	0.554	-0.002	0.606	-0.002	0.610	-0.002	0.594	-0.002	0.619	-0.002	0.646
LEVERAGE	0.025	<0.001	0.025	<0.001	0.025	<0.001	0.024	<0.001	0.024	<0.001	0.023	<0.001
LnMVE	-0.004	0.046	-0.003	0.074	-0.003	0.089	-0.004	0.059	-0.004	0.054	-0.004	0.041
MB	0.000	0.164	0.000	0.162	0.000	0.169	0.000	0.172	0.000	0.173	0.000	0.171
CASHFLOW	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001
LOSS	0.013	0.006	0.013	0.005	0.013	0.004	0.013	0.003	0.013	0.003	0.013	0.004
LTACC	-0.038	0.003	-0.037	0.003	-0.039	0.002	-0.040	0.001	-0.040	0.001	-0.038	0.002
AFTENURE	0.000	0.953	0.000	0.906	0.000	0.865	0.000	0.999	0.000	0.923	0.000	0.806
UXAF	0.006	0.024	0.006	0.025	0.006	0.028	0.006	0.031	0.006	0.034	0.006	0.042
UXAPNAS	0.000	0.955	0.000	0.907	0.000	0.991	0.000	0.983	0.000	0.968	0.000	0.873
BDINDP	0.004	0.322	0.004	0.300	0.004	0.297	0.004	0.304	0.004	0.292	0.005	0.263
ACSIZE	-0.007	<0.001	-0.007	<0.001	-0.006	<0.001	-0.007	<0.001	-0.007	<0.001	-0.007	<0.001
INDEPAC	0.010	0.052	0.010	0.048	0.010	0.050	0.010	0.064	0.010	0.061	0.010	0.071
$YEAR_1$	-0.004	0.212	-0.004	0.290	-0.003	0.341	-0.003	0.341	-0.004	0.314	-0.004	0.300
$YEAR_2$	-0.008	0.034	-0.008	0.038	-0.007	0.048	-0.007	0.045	-0.007	0.041	-0.007	0.047
n		1,409		1,409		1,409		1,409		1,409		1,409
Adjusted R^2		0.090		0.090		0.088		0.086		0.088		0.092

Panel F: Absolute value of discretionary accruals for low profitability (below median ROA = -0.026)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.137	<0.001	0.136	<0.001	0.135	<0.001	0.139	<0.001	0.139	<0.001	0.139	<0.001
DLKS	0.001	0.071										
DAFLKS			0.002	0.134								
DAPLKS					0.003	0.152						
ACLKS							0.002	0.247				
ACAFLKS									0.003	0.346		
ACAPLKS											0.009	0.049
BIG4	0.000	0.878	-0.001	0.753	0.000	0.983	0.000	0.905	-0.001	0.848	0.000	0.988
EQUITY	0.004	0.220	0.005	0.184	0.005	0.180	0.005	0.187	0.005	0.196	0.004	0.229
MERACQS	-0.003	0.581	-0.002	0.599	-0.002	0.605	-0.002	0.603	-0.002	0.605	-0.002	0.636
LEVERAGE	0.034	<0.001	0.034	<0.001	0.034	<0.001	0.034	<0.001	0.034	<0.001	0.033	<0.001
LnMVE	-0.002	0.072	-0.002	0.089	-0.002	0.095	-0.002	0.073	-0.002	0.076	-0.002	0.074
MB	0.000	0.424	0.000	0.433	0.000	0.425	0.000	0.436	0.000	0.433	0.000	0.424
CASHFLOW	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001
LOSS	-0.056	<0.001	-0.056	<0.001	-0.056	<0.001	-0.056	<0.001	-0.056	<0.001	-0.056	<0.001
LTACC	-0.016	0.155	-0.016	0.159	-0.016	0.151	-0.017	0.132	-0.017	0.132	-0.017	0.147
AFTENURE	0.000	0.502	0.000	0.482	0.000	0.448	0.000	0.508	0.000	0.501	0.000	0.441
UXAF	0.004	0.128	0.004	0.125	0.004	0.132	0.004	0.149	0.004	0.150	0.004	0.159
UXAPNAS	0.000	0.738	0.000	0.760	0.000	0.723	0.000	0.688	0.000	0.695	0.000	0.635
BDINDP	0.003	0.514	0.003	0.458	0.003	0.449	0.003	0.471	0.003	0.467	0.003	0.430
ACSIZE	-0.004	0.017	-0.004	0.018	-0.004	0.023	-0.005	0.011	-0.004	0.015	-0.004	0.019
INDEPAC	0.003	0.625	0.003	0.630	0.003	0.633	0.002	0.709	0.002	0.681	0.002	0.766
$YEAR_1$	-0.005	0.213	-0.004	0.255	-0.004	0.267	-0.004	0.304	-0.004	0.275	-0.004	0.265
$YEAR_2$	-0.012	0.001	-0.012	0.001	-0.011	0.002	-0.011	0.002	-0.011	0.002	-0.011	0.002
n		1,442		1,442		1,442		1,442		1,442		1,442
Adjusted R^2		0.089		0.088		0.088		0.088		0.087		0.089

Panel G: Absolute value of discretionary accruals for high profitability (above median ROA = -0.026)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.091	<0.001	0.088	<0.001	0.085	<0.001	0.087	<0.001	0.085	<0.001	0.086	<0.001
DLKS	0.000	0.135										
DAFLKS			0.001	0.336								
DAPLKS					0.001	0.715						
ACLKS							0.000	0.657				
ACAFLKS									0.000	0.969		
ACAPLKS											0.001	0.827
BIG4	0.004	0.035	0.004	0.040	0.004	0.026	0.004	0.028	0.004	0.027	0.004	0.026
EQUITY	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001	0.008	<0.001
MERACQS	-0.001	0.604	-0.001	0.644	-0.001	0.666	-0.001	0.649	-0.001	0.670	-0.001	0.671
LEVERAGE	-0.010	0.004	-0.010	0.004	-0.010	0.005	-0.010	0.004	-0.010	0.004	-0.010	0.004
LnMVE	-0.004	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001
MB	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
CASHFLOW	-0.001	0.007	-0.001	0.007	-0.001	0.007	-0.001	0.007	-0.001	0.007	-0.001	0.007
LOSS	0.006	0.005	0.006	0.004	0.006	0.003	0.006	0.002	0.006	0.002	0.006	0.002
LTACC	-0.049	<0.001	-0.049	<0.001	-0.050	<0.001	-0.050	<0.001	-0.050	<0.001	-0.050	<0.001
AFTENURE	0.000	0.678	0.000	0.636	0.000	0.672	0.000	0.701	0.000	0.690	0.000	0.690
UXAF	0.000	0.979	0.000	0.983	0.000	0.986	0.000	0.978	0.000	0.977	0.000	0.976
UXAPNAS	0.000	0.375	0.000	0.357	0.000	0.366	0.000	0.372	0.000	0.364	0.000	0.365
BDINDP	0.000	0.893	0.000	0.976	0.000	0.999	0.000	0.972	0.000	0.990	0.000	0.993
ACSIZE	-0.002	0.022	-0.002	0.021	-0.002	0.022	-0.002	0.019	-0.002	0.022	-0.002	0.021
INDEPAC	0.005	0.104	0.005	0.102	0.005	0.105	0.005	0.105	0.005	0.104	0.005	0.103
$YEAR_1$	-0.002	0.451	-0.001	0.502	-0.001	0.512	-0.001	0.504	-0.001	0.500	-0.001	0.504
$YEAR_2$	-0.004	0.029	-0.004	0.029	-0.004	0.029	-0.004	0.030	-0.004	0.028	-0.004	0.029
n		1,375		1,375		1,375		1,375		1,375		1,375
Adjusted R^2		0.113		0.112		0.112		0.112		0.112		0.112

Panel H: Income–increasing discretionary accruals (+ DACC)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value-	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.100	<0.001	0.098	<0.001	0.098	<0.001	0.100	<0.001	0.098	<0.001	0.098	<0.001
DLKS	0.000	0.461										
DAFLKS			0.000	0.979								
DAPLKS					0.001	0.639						
ACLKS							0.000	0.509				
ACAFLKS									0.000	0.907		
ACAPLKS											0.003	0.417
BIG4	0.003	0.101	0.003	0.097	0.003	0.088	0.003	0.098	0.003	0.098	0.003	0.090
EQUITY	0.002	0.254	0.002	0.232	0.002	0.230	0.002	0.230	0.002	0.232	0.002	0.225
MERACQS	0.000	0.965	0.000	0.981	0.000	0.988	0.000	0.985	0.000	0.982	0.000	0.974
LEVERAGE	-0.010	0.002	-0.010	0.002	-0.010	0.002	-0.010	0.002	-0.010	0.002	-0.010	0.002
LnMVE	-0.004	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001	-0.003	<0.001
MB	0.000	0.189	0.000	0.203	0.000	0.203	0.000	0.194	0.000	0.202	0.000	0.203
CASHFLOW	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001	-0.008	<0.001
LOSS	-0.003	0.170	-0.003	0.184	-0.003	0.174	-0.003	0.184	-0.003	0.183	-0.003	0.169
LTACC	-0.001	0.886	-0.002	0.836	-0.002	0.849	-0.002	0.840	-0.002	0.836	-0.002	0.853
AFTENURE	0.000	0.161	0.000	0.165	0.000	0.152	0.000	0.171	0.000	0.164	0.000	0.170
UXAF	0.000	0.912	0.000	0.910	0.000	0.926	0.000	0.888	0.000	0.907	0.000	0.915
UXAPNAS	0.000	0.208	0.000	0.203	0.000	0.204	0.000	0.206	0.000	0.203	0.000	0.204
BDINDP	-0.001	0.702	-0.001	0.734	-0.001	0.763	-0.001	0.719	-0.001	0.735	-0.001	0.781
ACSIZE	-0.001	0.129	-0.001	0.128	-0.001	0.131	-0.002	0.111	-0.001	0.127	-0.001	0.120
INDEPAC	0.005	0.129	0.005	0.131	0.005	0.129	0.005	0.138	0.005	0.132	0.005	0.138
$YEAR_1$	-0.002	0.430	-0.002	0.464	-0.002	0.462	-0.001	0.472	-0.002	0.466	-0.001	0.490
$YEAR_2$	-0.003	0.118	-0.003	0.117	-0.003	0.121	-0.003	0.128	-0.003	0.119	-0.003	0.128
n		1,675		1,675		1,675		1,675		1,675		1,675
Adjusted R^2		0.076		0.075		0.076		0.076		0.075		0.076

Panel I: Income–decreasing discretionary accruals (- DACC)

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	-0.075	<0.001	-0.072	0.001	-0.066	0.002	-0.067	0.002	-0.067	0.001	-0.067	0.001
DLKS	-0.001	0.047										
DAFLKS			-0.002	0.076								
DAPLKS					-0.003	0.224						
ACLKS							0.000	0.992				
ACAFLKS									-0.001	0.856		
ACAPLKS											-0.005	0.320
BIG4	0.003	0.447	0.003	0.363	0.002	0.549	0.003	0.470	0.003	0.467	0.002	0.522
EQUITY	-0.014	<0.001	-0.014	<0.001	-0.014	<0.001	-0.014	<0.001	-0.014	<0.001	-0.014	<0.001
MERACQS	0.007	0.131	0.006	0.141	0.007	0.136	0.007	0.132	0.007	0.132	0.006	0.143
LEVERAGE	-0.033	<0.001	-0.033	<0.001	-0.033	<0.001	-0.033	<0.001	-0.033	<0.001	-0.032	<0.001
LnMVE	0.004	0.002	0.003	0.004	0.003	0.009	0.003	0.010	0.003	0.009	0.003	0.008
MB	0.000	0.317	0.000	0.343	0.000	0.360	0.000	0.370	0.000	0.368	0.000	0.365
CASHFLOW	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
LOSS	-0.029	<0.001	-0.029	<0.001	-0.029	<0.001	-0.030	<0.001	-0.029	<0.001	-0.029	<0.001
LTACC	0.054	<0.001	0.052	<0.001	0.052	<0.001	0.053	<0.001	0.053	<0.001	0.052	<0.001
AFTENURE	0.000	0.945	0.000	0.941	0.000	0.955	0.000	0.996	0.000	0.985	0.000	0.928
UXAF	-0.004	0.223	-0.004	0.206	-0.004	0.222	-0.004	0.227	-0.004	0.227	-0.004	0.243
UXAPNAS	0.000	0.903	0.000	0.876	0.000	0.917	0.000	0.935	0.000	0.939	0.000	0.991
BDINDP	-0.005	0.313	-0.006	0.281	-0.006	0.278	-0.006	0.265	-0.006	0.266	-0.006	0.269
ACSIZE	0.005	0.006	0.005	0.006	0.005	0.009	0.005	0.008	0.005	0.007	0.005	0.007
INDEPAC	-0.001	0.896	-0.001	0.893	0.000	0.945	0.000	0.943	0.000	0.944	0.000	0.993
$YEAR_1$	0.005	0.252	0.004	0.314	0.004	0.344	0.004	0.332	0.004	0.333	0.004	0.320
$YEAR_2$	0.012	0.002	0.012	0.002	0.012	0.003	0.012	0.003	0.012	0.003	0.012	0.003
n		1,142		1,142		1,142		1,142		1,142		1,142
Adjusted R^2		0.207		0.206		0.205		0.204		0.204		0.205

Panel J: Absolute value of discretionary accruals excluding companies which did not have audit committee

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.095	<0.001	0.093	<0.001	0.093	<0.001	0.095	<0.001	0.094	<0.001	0.093	<0.001
DLKS	0.000	0.478										
DAFLKS			0.000	0.893								
DAPLKS					0.002	0.246						
ACLKS							0.000	0.438				
ACAFLKS									0.001	0.523		
ACAPLKS											0.008	0.006
BIG4	0.001	0.577	0.001	0.578	0.001	0.500	0.001	0.565	0.001	0.606	0.002	0.461
EQUITY	0.006	0.004	0.006	0.004	0.006	0.004	0.006	0.004	0.006	0.003	0.006	0.005
MERACQS	-0.001	0.534	-0.001	0.551	-0.001	0.551	-0.001	0.527	-0.001	0.551	-0.001	0.615
LEVERAGE	0.015	<0.001	0.015	<0.001	0.015	<0.001	0.014	<0.001	0.014	<0.001	0.014	<0.001
LnMVE	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
MB	0.000	0.195	0.000	0.209	0.000	0.210	0.000	0.199	0.000	0.207	0.000	0.217
CASHFLOW	-0.013	<0.001	-0.013	<0.001	-0.013	<0.001	-0.013	<0.001	-0.013	<0.001	-0.013	<0.001
LOSS	0.007	0.002	0.008	0.001	0.007	0.002	0.008	0.001	0.007	0.001	0.007	0.002
LTACC	-0.030	0.003	-0.030	0.003	-0.029	0.004	-0.030	0.003	-0.030	0.003	-0.028	0.005
AFTENURE	0.000	0.455	0.000	0.460	0.000	0.407	0.000	0.471	0.000	0.449	0.000	0.394
UXAF	0.002	0.325	0.002	0.323	0.002	0.298	0.002	0.331	0.002	0.332	0.002	0.347
UXAPNAS	0.000	0.664	0.000	0.648	0.000	0.629	0.000	0.652	0.000	0.643	0.000	0.570
BDINDP	0.000	0.963	0.000	0.948	0.001	0.882	0.000	0.956	0.000	0.939	0.001	0.871
ACSIZE	-0.003	0.002	-0.003	0.002	-0.003	0.003	-0.003	0.002	-0.003	0.002	-0.003	0.002
INDEPAC	0.002	0.628	0.003	0.602	0.002	0.631	0.003	0.621	0.003	0.606	0.003	0.596
$YEAR_1$	-0.002	0.337	-0.002	0.363	-0.002	0.385	-0.002	0.370	-0.002	0.374	-0.002	0.384
$YEAR_2$	-0.005	0.018	-0.005	0.019	-0.005	0.022	-0.005	0.021	-0.005	0.020	-0.005	0.025
n		1,981		1,981		1,981		1,981		1,981		1,981
Adjusted R^2		0.125		0.125		0.126		0.126		0.125		0.129

Panel K: Absolute value of discretionary accruals and interactions between APNAS and INTERLOCKINGS and AFTENURE AND INTERLOCKINGS

Variables	DLKS		DAFLKS		DAPLKS		ACLKS		ACAFLKS		ACAPLKS	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
(Constant)	0.093	<0.001	0.092	<0.001	0.089	<0.001	0.092	<0.001	0.092	<0.001	0.091	<0.001
DLKS	0.001	0.124										
DAFLKS			0.002	0.167								
DAPLKS					0.004	0.062						
ACLKS							0.000	0.908				
ACAFLKS									-0.001	0.652		
ACAPLKS											0.004	0.757
BIG4	0.001	0.447	0.001	0.572	0.002	0.330	0.002	0.390	0.002	0.364	0.003	0.187
EQUITY	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	<0.001	0.007	0.001
MERACQS	-0.002	0.338	-0.002	0.353	-0.002	0.381	-0.002	0.386	-0.002	0.367	-0.002	0.351
LEVERAGE	0.020	<0.001	0.020	<0.001	0.020	<0.001	0.020	<0.001	0.020	<0.001	0.018	<0.001
LnMVE	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
MB	0.000	0.264	0.000	0.270	0.000	0.268	0.000	0.274	0.000	0.271	0.000	0.298
CASHFLOW	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001	-0.001	<0.001
LOSS	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001	0.012	<0.001
LTACC	-0.026	0.002	-0.026	0.002	-0.026	0.002	-0.027	0.001	-0.027	0.001	-0.028	0.001
AFTENURE	0.000	0.716	0.000	0.634	0.000	0.501	0.000	0.304	0.000	0.197	0.000	0.161
UXAF	0.004	0.032	0.004	0.030	0.004	0.028	0.003	0.035	0.003	0.038	0.003	0.042
LnAPNAS	0.000	0.111	0.000	0.096	0.000	0.114	0.000	0.125	0.000	0.107	0.000	0.431
BDINDP	0.002	0.503	0.002	0.439	0.002	0.410	0.002	0.447	0.002	0.432	0.002	0.423
ACSIZE	-0.003	0.001	-0.003	0.001	-0.003	0.001	-0.003	0.001	-0.003	0.001	-0.003	0.002
INDEPAC	0.003	0.301	0.003	0.278	0.003	0.283	0.003	0.328	0.003	0.317	0.002	0.484
LnAPNAS*INTERLOCKING	0.000	0.897	0.000	0.705	0.000	0.953	0.000	0.784	0.000	0.657	-0.002	0.165
AFTENURE*INTERLOCKING	0.000	0.685	0.000	0.544	0.000	0.306	0.000	0.689	0.000	0.336	0.002	0.081
$YEAR_1$	-0.004	0.151	-0.003	0.211	-0.003	0.171	-0.003	0.149	-0.003	0.190	-0.003	0.145
$YEAR_2$	-0.008	0.001	-0.007	0.001	-0.008	0.001	-0.008	0.001	-0.007	0.001	-0.008	<0.001
n		2,817		2,817		2,817		2,817		2,817		2,817
Adjusted R^2		0.119		0.118		0.119		0.118		0.118		0.115