

**Curtin Business School  
School of Accounting**

**The Impact of Geographic Proximity between Auditor and Client on Audit Quality:  
Empirical Evidence from Australia**

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Master of Philosophy (Accounting)  
Of  
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**Declaration**

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


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## **ABBREVIATIONS:**

AAERs Accounting and Auditing Enforcement Releases

AARF Australian Accounting Research Foundation

AGAAP Australian Generally Accepted Accounting Principles

AICPA American Institute of Certified Public Accountants

AIFRS Australian Equivalent of International Financial Reporting Standards

APESB Accounting Professional and Ethical Standards Board

ASAs Australian Auditing Standards

ASAEs Standards on Assurance Engagements

ASIC Australian Securities and Investments Commission

ASREs Standards on Review Engagements

ASX Australian Securities Exchange

ASX CGC Australian Securities Exchange Corporate Governance Council

AUASB Auditing and Assurance Standards Board

BRC Blue Ribbon Committee

CALDB Companies Auditors and Liquidators Disciplinary Board

CEO Chief Executive Officer

CFO Chief Financial Officer

CIA Certified Internal Auditor

CLERP 9 Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004 (Australia)

CSRC China Securities Regulatory Commission

DTT Deloitte Touche Tohmatsu

EC European Commission

EU European Union

EY Ernst & Young

FASB Financial Accounting Standards Board

FCCG Financial Committee on Corporate Governance  
FRC Financial Reporting Council  
GAO Government Accountability Office (US)  
GAAP Generally Accepted Accounting Principles  
GFC Global Financial Crisis  
GICS Global Industry Classification Standard  
HIH Health International Holdings  
IAASB International Auditing and Assurance Standards Board  
IAF Internal Audit Function  
IASB International Accounting Standards Board  
ICAA Institute of Chartered Accountants in Australia  
ICAEW Institute of Chartered Accountants in England and Wales  
IESBA International Ethics Standards Board for Accountants  
IFAC International Federation of Accountants  
IFRS International Financial Reporting Standards  
IIA Institute of Internal Auditors  
IPA Institute of Public Accountants  
ISAs International Standards on Auditing  
NACD National Association of Corporate Directors  
NYSE New York Stock Exchange  
PCAOB Public Company Accounting Oversight Board (US)  
POB Public Oversight Board (US)  
PwC PricewaterhouseCoopers  
SEC Securities and Exchange Commission (US)  
SOX Sarbanes-Oxley Act 2002 (US)  
S&P Standard & Poor's  
UK United Kingdom  
US United States of America

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# Abstract

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Auditing is an important aspect of corporate governance and analyses of several contemporary financial scandals have found that insufficient levels of independent audit for effective monitoring and assurance. One under-researched mediating factor of audit quality in terms of the auditor and client relationship is geographic proximity (Kane and Velury 2004; Chaney et al. 2004; Louis 2005). Recently Choi et al. (2012) reported that geographic proximity has a significant impact on auditor- client relationship in the US. Based on a sample of 520 (Australian listed) firms per year spanning the period from 2010 to 2013 (giving a final sample of 2080), this exploratory study examines geographic proximity between the auditor and client effect on audit quality. However, the results show no significant difference between local auditors and non-local auditors due to lack of cross-sectional variation in terms of proximity variable. Although, geographic proximity may result in geographical advantages or a closer auditor-client relationship, it does not affect the audit quality in Australian context.

# Chapter One

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## Introduction

### 1.1 Background of the Study

Audit quality has received much attention in recent times by regulators, governments, scientists and auditors. For example, in January 2013 the International Accounting and Assurance Standards Board (IAASB) has published a new framework for audit quality. The aim of the IAASB is to encourage stakeholders to explore ways to improve audit quality and to facilitate a dialogue on this topic (IAASB 2013). The new framework reflects the multidimensional nature of the concept. Besides regulators, supervisory authorities consider their roles in enhancing audit quality. For instance, audit quality is subject of ongoing debates in Australia, since the HIH and One-Tel scandals were witnessed. As a consequence, the Audit Quality Review Board (AQRB) examines the national audit firms on quality controls more strictly (Treasury 2010). They argue that auditors do not always comply with relevant auditing standards and standards of quality control, resulting in audits of inappropriate quality. This shows that it remains important to discuss the issue. Therefore, this study examines the audit quality concept by investigating the impact of an engagement-specific factor on audit quality. The focus is on a new engagement-specific factor, namely the geographic proximity between auditor and client.

During the past decade, scandals and economic events have made audit tenure and audit quality center of attention for a lot of debate. The issue of auditor independence and its implications for audit quality has been the focus of much debate by regulators, professional bodies and academics. These debates have typically focused on high profile

corporate failures in Australia (e.g., HIH Insurance, One-Tel, Allco Finance, Westpoint, Centro, ABC Learning) and internationally (e.g., Enron, WorldCom, Parmalat, Madoff Investments), and typically involve claims that they arose as a consequence of an aspect of the audit engagement which undermined auditor independence and impaired audit quality. In response to the high profile accounting scandals, a number of regulatory changes were implemented throughout the world to improve the quality of corporate governance practices (National Association of Corporate Directors (NACD) 1996; Securities and Exchange Commission (SEC) 2000; Joint Committee on Public Accounts and Audit 2002). Major reforms such as the Sarbanes-Oxley Act (SOX) (enacted on 30 July 2002) in the US; the Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004 (also known as 'CLERP 9') (enacted on 1 July 2004) as well as the Australian Securities Exchange (ASX) Corporate Governance Council's Principles of Good Corporate Governance and Best Practice Recommendations (ASX CGC 2003, 2007, 2010, 2014) in Australia; and the Directive 2004/109/EC (enacted on 15 December 2004) of the European Parliament were introduced with the objective of improving the credibility, objectivity, and accuracy of the financial reporting process.

However, research suggests that there is considerable divergence in the recommended structure and role of audit committees across different jurisdictions (Collier and Zaman 2005). Following the well-publicized corporate collapses (such as Enron and WorldCom in the US and HIH Insurance and Harris Scarfe Ltd. in Australia), the efficacy of audit committees has been challenged (Turley and Zaman 2004). Legislators have responded by expanding the responsibilities of audit committees and placing greater emphasis on the role that they play in enhancing audit independence (US Congress 2002; Commonwealth of Australia 2004). Recently, the role of external auditor have become firmly engrained in key

legislative statutes of countries worldwide (Imhoff 2003). External auditor remains the primary focus for the major reform efforts over the past few decades which introduced recommendations and requirements to improve external auditor quality will ultimately improve audit quality. Following empirical research focuses the primary objective of the study is to examine the external auditors' relationship with the client when geography plays a vital role.

The role of proximity has a long history in the literature and has been examined across a wide range of economic areas. Proximity can be subdivided into different dimensions including, organizational, technological and geographical proximity (Knoben and Oerlemans 2006). This study focuses on geographical proximity. Geographic proximity continues to play a role in the decision-making behavior of economic agents, despite the sharp decline in transportation and communication cost and vast increasing information technology (Coval and Moskowitz 1999). Prior studies in the marketing literature focused on spatial distribution of buyers and sellers and the physical distribution cost, whereas more recent marketing studies focus on the role of geographic proximity in inter-firm relations (Ganesan et al. 2006). The effects of distance are also documented in the financing literature, in which the importance of proximity has been emphasized for investor's portfolio management (e.g., Coval and Moskowitz 1999; Ivkovich and Weisbenner 2005), equity analysis (Bae et al. 2008; Malloy 2005) and debt contracting (Agarwal and Hauswald 2010, Hollander and Verriest 2012). These studies indicate that geographic proximity affects the decision making behavior and the contractual relationships between particular economic agents. In addition, previous studies about audit quality document various engagement-specific factors (e.g., non-audit services and auditor tenure) that influence auditors' independence and thus audit quality. However, there has been less attention for

the role of geographic proximity in shaping the auditor-client relationship. Therefore, this study focuses on the influence of distance on the auditor-client relationship and the effect on audit quality.

The study of Choi et al. (2012) is one of the first studies that investigate if auditor-client geographic proximity is associated with audit quality. They show evidence that, information advantages associated with local audits enable auditors to better deter clients' incentives and abilities for opportunistic earnings management. However, the US sample used in the study of Choi et al. (2012) is characterized by a high litigation and reputation risk for auditors. This may deter auditors from giving up independence, which results in a high audit quality. Therefore, it is interesting to investigate whether the association between auditor-client distance and audit quality is valid in a market with different characteristics. This study investigates the association for a sample of Australian audit market (2010-2013). In the study of Ramseyer and Rasmussen (2010), they concluded that Australia perform with relatively low litigation rates whereas the US has a high litigation threat. This threat of litigation deters auditors to inappropriate audit reporting. When the likelihood to be sued is low, the auditor may feel tempted to keep a close relationship with the client, in order to ensure future fees (Gaeremyck and Willekens 2003). Hence, the results are of interest for regulators and supervisory authorities, as they are concerned about audit quality. Furthermore, the distances in the Australia are much smaller than in the US and other country. Therefore, this is an interesting setting to investigate if the geographic advantages are applicable in a setting with much smaller distances between the auditor and the client.

## 1.2 Motivation and Objectives

The motivation of this study is to minimize the gap in the literature by providing empirical evidence of direct relationship between audit quality and auditor-client geographical proximity as a new engagement specific factor. There is a limited understanding of the moderating effect geographic proximity has on audit quality for auditor-client relationship. Originally this study was inspired by Choi et al. (2012) study where they examined the relationship between audit quality and auditor-client geographical proximity for the year 2002-2005. Using accrual quality as a proxy they concluded that local auditor tends to provide higher quality audit services than non-local auditor. As Morgan (2004) stated, “globalization and digitalization have been presented as ineluctable forces which signal the death of geography”. It is quite riveting during last couple of year the rapid emerge of information and communication technology (ICT) and its application in business left a huge impact to minimize the distance barrier in every sector of business including auditing. However, after few years another researcher (Frenken et al. 2010) restate that “the death of distance hypothesis has not been proven”, he also argued that research and studies are still suffered from important limitation due to poor availability of data. Therefore, present study will stress whether geographic proximity still matters in terms of determining audit quality. Furthermore, prior research suggests local auditor are advantageous due to lower information asymmetry, this study will explore a new avenue by identifying the actual fact- whether geographic proximity and lower information asymmetry also improve the audit quality or not? According to Operations Management Technology Consulting (OMT 2011), the total money spent on Information Technology worldwide has been most recently estimated as US \$3.5 trillion, and is currently growing at 5% p.a. (doubling every 15 years). Now, another motivational question will be- if the geographic

proximity still matters in every sector of business, then what is the justification of spending so much funding and resources on ICT every year? Specifically, the result of the study will also trigger the issue of communication costs which are in place to replace the physical distance of the auditor to improve the audit quality.

Audit offices can focus on local clients in the same city or diversify to more distantly located clients. Local auditors have superior knowledge and are in a better position to get information about their clients (Francis et al. 1999); can visit clients and talk to employees and suppliers more frequently; and have better understanding of local businesses and market conditions (Choi et al. 2008). Increased distance between auditor and client has an adverse effect of audit quality (Choi et al. 2008). Prior research in the US has also found that, decreased distance between the Securities and Exchange Commission (SEC) and a firm increases the effectiveness of monitoring the firm's behavior (Kedia and Rajgopal 2005). DeFond et al. (2011) reported similar findings about the relationship between the proximity of the Security Exchange Commission (SEC) regional offices and the audit office and concluded that geographic location influences audit quality. The effects of geographic proximity on audit quality in the Australian context have not been fully examined and thus, are worthy of investigation.

The primary concern of this proposed research is the effect of auditor locality on audit quality in Australia. Therefore, the following research questions will be addressed:

1. A number of engagement specific factors have already been identified for the auditor-client relationship, but is the locality of auditors an additional factor of that relationship that can influence audit quality?
2. If auditor locality is a factor, does it impair or enhance audit quality in terms of key audit quality factors?

### 1.3 Main discussion of the study

Based upon the implications from prior studies, geographic proximity results in advantages including information gathering, increased monitoring capabilities and lower transaction costs (Agarwal and Hauswald 2010; Kang and Kim 2008; Petersen and Rajan 2002). Auditors whose practicing office is located in the same Metropolitan Statistical Area (MSA) as where the client's headquarters is vested are defined as local auditors and they might benefit from geographic proximity. In addition, local auditors will be able to obtain more client-specific knowledge while they have the opportunity to visit the client's operations more frequently and obtain client-specific news from local media. Therefore, it could be argued that local auditors better constrain managements' abilities for opportunistic earnings management. On the other hand, geographic proximity could result in relatively closer personal ties between local auditors and their clients, which is detrimental to the auditors' objectivity and hence their independence (Bamber and Iyer 2007; Myers et al. 2003). As in many other studies, discretionary accruals are used as the outcome of opportunistic earnings management and serves as a proxy for audit quality (Choi et al. 2012; Chung and Kallapur 2003; Myers et al. 2003; Reynolds and Francis 2001). The expectation is that when the auditors benefit from the advantages of being geographic proximate, clients of local auditors have lower levels of absolute discretionary accruals, indicating a higher audit quality in comparison with clients of non-local auditors. However, higher levels of absolute discretionary accruals are expected if geographic proximity results in an impairment of audit independence (Choi et al. 2012). The univariate results from the observed current study indicate that, the mean discretionary accruals for firms with a local



auditor are lower than for those with an auditor who is not located in the same State area. Although, this might indicate that local auditors perform a higher audit quality. Thus, there is a significant difference between the local auditor and an auditor located in another State area as the client. This finding suggests that due to the smaller distances in Australia, the Australian audit market can be seen as one area in which there is a distinction between local auditors and non-local auditors. Furthermore, the regression results show a negative association between the absolute value of discretionary accruals and the variable of interest (DMS100)<sup>1</sup>. Whereas, this might suggest that local auditors better constrain management from engaging in earnings management than non-local auditors, the results are not significant. Even so after dividing the sample into positive and negative discretionary accruals, the variable of interest does not have a significant effect. The results remain robust after controlling for difference in economic activities and for using another proxy for distinguishing a local auditor. In sum, the results for the Australian audit market are not in line with the study of Choi et al. (2012). In other words it can be presumed that, the effect of geographic proximity on audit quality is not generalizable to the Australian audit market.

#### **1.4 Significance of the Study**

This study contributes to the existing literature in several ways. First, although prior studies in various research fields have investigated the effect of geographic proximity between economic agents, the study of Choi et al. (2012) is the first study who explored this association for audit quality in US. This study contributes to the literature because it

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<sup>1</sup> DM100 denotes here as an indicator variable for auditor location. DMS100 is zero if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same State metropolitan area, and one otherwise.

provides additional insight in the effect of a relatively new engagement specific factor, namely geographic proximity on audit quality in Australia. This study further observes whether the relationship found in Choi et al. (2012) for the US environment is valid in Australia.

Additionally, this study will be of interest to regulators and supervisory authorities since the quality of audit remains subject of an ongoing debate in all jurisdictions. The results of this study show that there is no distinction between local auditors and auditors located in a different geographic area as the clients' headquarters in Australia. Therefore, the engagement-specific factor of geographic proximity does not affect the audit quality. Hence, at this moment there is no need to enact any policy for auditor to limit their initiatives regarding opening new offices in the city (Big4 firms have continuously expanded their practicing offices to cities in which their clients are headquartered, Choi et al. 2012). However, findings of this research may be of particular interest for researchers examining cross-border geographic proximity effect on audit quality. Scholars will also benefit as this study will provide a contemporaneous update on audit quality in Australia and suggest direction for future research.

## 1.5 Limitation of the Study

This study deals with several limitations. First, in order to measure the audit quality for local auditors the modified Jones (1995)<sup>2</sup> is used as proxy. The model measures the level of discretionary accruals, which can be seen as an outcome of opportunistic earnings

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<sup>2</sup> Jones (1991) proposes a model that relaxes the assumption that nondiscretionary accruals are constant. Her model attempts to control for the effect of changes in a firm's economic circumstances on nondiscretionary accruals. In 1995, Dechow, Sloan and Sweeney modified Jones model to eliminated the conjectured tendency of the original model to measure discretionary accruals with error when discretion is exercised over revenues. In modified model, nondiscretionary accruals are estimated during the event period.

management (Chung and Kallapur 2003; Frankel et al. 2002). The concept of audit quality is difficult to measure and the proxy used has some limitations and obtain some critique. For example, an endogeneity issue can arise while the residual measures other things than audit quality such as volatility or growth (Bharath et al. 2008).

Second, the variable of interest has some limitations. For example, this study uses an assumption to measure auditor-client distance. It is assumed that the location of signing the annual report is the location from which the audit is conducted. However, the members of the engagement team might live in another city than where the engagement office is located. Therefore, individual team members of the engagement team may benefit from advantages arising from geographic proximity, such as obtaining client-specific knowledge from local newspapers. This measurement error is partly mitigated by using another proxy for auditor-client distance. Another problem that arises with regard to the variable of interest (DMS100) is the problem that firms make a choice between local versus a non-local auditor. Therefore, the regression proxy to assess earnings management and a dummy for local auditor may suffer from sample selection bias (Heckman 1979). However, little is known about the factors that determine the choice to appoint a local or nonlocal auditor and the auditor locality. In order to mitigate the concern that clients headquartered in a specific area are more or less likely to appoint a local auditor, this study splits the sample into subsamples (WA, NSW and VIC) based on economic activity. Besides, the study of Choi et al. (2012) shows robust results applying the Heckman (1979) approach with regard to the potential self-selection bias.

Third, due to data limitations a number of control variable (issue, cash flow variability, and sales variability) are not included in the regression model. Prior literature shows that control variables are known to affect the magnitude of earnings management

(Chung and Kallapur 2003; Myers et al. 2003; Reichelt and Wang 2010). Therefore, it might be argued that for example, issue (control variable) which control financing transaction on earning management might have had a greater impact on auditor-client distances (Teoh et al. 1998). Hence, excluding the control variables can cause an omitted variable bias which may result in the insignificant results. Although, this study tries to mitigate the omitted variables by means of including a comprehensive set of other control variables.

## **1.6 Disposition of the Thesis**

The remainder of this study proceeds as follows. Chapter Two will focus on the empirical literature surrounding audit quality, geographic proximity and auditor-client relationship. The Chapter begins with reviewing the concept of audit quality and geographic proximity. Next, the association between geographic proximity and other factors (audit quality, economic agent and financial reporting) are discussed in details along with advantage. Finally, the impact of geographic proximity on audit quality is also discussed in Australian context when auditor-client relationship is a vital mediator.

Chapter Three discusses the theoretical framework of this study and the empirical literature relating to the hypotheses tested. The two most applicable theories were discussed and justified. Finally, a summary of Chapter Three is provided.

Chapter Four outlined the research method used to test the underling hypotheses of current study. Initially, selection of the sample size, source and period justification are explained in details. Then this study introduced us with the dependent, independent and control variable of current research. Finally, a summary of Chapter Four is provided.

In chapter five, this study will review the descriptive statistics for the variables.

Furthermore, data cleaning, sample selection procedure, industry breakdown, State wise sample breakdown, local auditor breakdown, kilometer wise auditor breakdown and average distance breakdown by State will also to be discussed in this Chapter. Finally, a summary of Chapter Five is provided.

Chapter Six will discuss the main empirical result of current study. The result of the regressions will examine the impact of geographic proximity on audit quality. In this chapter the study will report the regression result for these two different measures. The analysis is performed for a sample of 2080 firm-year observation from 2010-2013 and a comparison of the analysis is outlined in this chapter followed by a summary.

Chapter Seven will discuss the robustness and sensitivity of the main result discussed in Chapter Six. In chapter seven, this study will try to use other alternative measures of the test variable by partitioning the distance using different kilometers cap and subdivide samples by concentration of economic activity. Finally, a summary of Chapter Seven is also provided.

Finally, the major conclusions and implications of this study will be discussed in Chapter Eight. Based on empirical results justification for the acceptance or rejection of the hypotheses is summarized. Contributions of the study with limitations and future research window for the similar study will also be discussed.

# Chapter Two

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## Literature Review

### 2.1 Overview of the chapter

Chapter One provided the background and motivation of the study. The primary research questions and objectives were also highlighted in details. Finally, the result of the study, significance and limitations were also discussed at a glance.

Chapter Two will focus on the empirical literature surrounding audit quality, geographic proximity and auditor-client relationship. The Chapter begins with reviewing the concept of audit quality and geographic proximity. Next, the association between geographic proximity and other factors (audit quality, economic agent and financial reporting) are discussed in details along with advantage. Finally, the impact of geographic proximity on audit quality is also discussed in Australian context when auditor-client relationship is a vital mediator.

### 2.2 Audit quality

There is no agreement among researcher about the definition of audit quality, until today (Hussein and Mustafa, 2013). There are many definition of audit quality but DeAngelo (1981b) provides one of the most cited definitions of audit quality:

“The quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system and (b) report that breach” (DeAngelo, 1981b, p. 186).

By this definition, audit quality is not coined in a clear-cut, measurable way. Instead, DeAngelo lets the markets perception guide with the advantage of not generalizing the concept of audit quality across legislation, culture, audit firm sizes, audit firm industry expertise, etc. Audit quality is the probability that financial statements contain no material misstatements. According to DeAngelo (1981b), audit quality is a function of the auditor's ability to detect material misstatements (technical capabilities) and reporting the errors. He pointed out both auditor and industry specialized auditor may detect material misstatements in the client's financial statements and report it. Palmrose (1988) defines audit quality in terms of level of assurance. Since actual audit quality is unobservable beforehand, a valid proxy is needed to investigate relation between actual audit quality and other factors (Hussein and Mustafa 2013).

The aim of auditors, the financial statements, thus ensuring quality, accountability means being free from material as misstatement of the audited financial trumpet skills. In fact, this definition emphasizes the results of the audit, it means the audited financial skills forms reliability, shows high quality auditor does. Titamn and Trueman (1986) have been defined quality audit after audit the accuracy of the information that is available to investors, Palmrose (1988) definition similar to the definition of audit quality. Davidson & Neu (1993) defined audit quality at the auditor's ability to detect and report the discovery of a material misstatement or manipulation done on their net understanding. However, Lam & Chang (1994) believe that the quality of audit services to be examined rather than to examine all, must be determined for each audit project singly. Many other studies (Chung and Kallapur, 2003) and (Frankel et al., 2002), reporting bias can be used to infer and deduce the quality audit is used. Like the main parameters affecting the quality of the audit, they are both precautionary measure commitment. King and Schwartz (1999) are analyzed

the extent of Supervision of the audit as a quality indicator when auditors under different legal regimes work. Their results demonstrated that the administration predicted the function of punitive legal actions against auditors.

Arrunada (2000) found implementing continuous auditing may earn and maintain a reputation as auditors are more familiar with the issues and problems. Willenberg (1999) examined the relationship between audit quality and audit remuneration and concludes quality of audit services is affected by the auditor's fee. In Australia, the Treasury (2010) documents audit quality to be a broad term consisting of a number of factors including the registration system of company auditors, standards on accounting and auditing, standards on ethics subjected to members of professional accountancy bodies, professional attributes associated with auditors and auditors' staff personnel, audit regulators involved in the audit review process, internal culture of the audit firm, and audit methodology selected by the audit firms.

Another possibility could be to look at the vast range of literature that has looked at audit quality and audit tenure underpinning geographic proximity. It is presumed that time and length of audit relationship again is a fair proxy for audit client knowledge. On this note, for instance Myers et al. (2003) found a clear-cut correlation between higher earnings quality and longer audit tenure. Also Chen et al. (2008) reached this conclusion, and found that discretionary accruals decreased significantly with longer audit tenures. The positive links between audit quality and audit tenure is further substantiated by research by Geiger & Raghunandan (2002), Johnson et al. (2002) and Mansi et al. (2004). Lim & Tan (2010) however found that this positive effect however is moderated by specialization and client dependency.



Brooks et al. (2013) found that earnings quality increases with auditor tenure only when the bonding effect is weak, such as in firms audited by specialist auditors and only in industries with high litigation risk and that the concavity of audit quality only exists when the bonding effect is strong, such as in firms audited by non-specialist auditors and by auditors of high client importance and in low litigation industries. However, Manry et al. (2008) could only partly confirm these findings but found no real relationship for big audits suggesting a consistent audit quality level. Finally, Davis et al. (2009) found that in the pre-Sarbanes Oxley Act era, there was a negative relationship between audit tenure and audit quality but this trend did not persist into the post-Sarbanes Oxley Act era. Again, this study suggests that this could be due to the quality control systems in place in the audit companies as a consequent of the Sarbanes Oxley Act and the post-Enron public perception of the audit companies and audit firms' value at stake.

However, Carey & Simnet (2006) did find significant deterioration of audit quality on non-Big 4 engagements. Therefore, the findings suggest that increased tenure and, hence, client specific knowledge tend to result in better audits. However, in a number of studies the effects are moderated for especially the Big 4 audit firms. This study would like to accentuate the research by Davis et al. (2009) who found significant differences before and after the implementation of Sarbanes Oxley Act. This act was supposed to heighten audit quality, and is hence consistent with literature and our view that Big 4 provides better quality audits (Becker et al. 1998 and Francis et al. 1999).

Essentially, because the research question of the study examines the profound dynamics of an audit setup in Australia. Therefore, this study needs a common point of reference for theories, which enable to appraise an eventual effect; and no matter the conclusions the study reach on the existing setup, or the conclusion reach for improvements

or directions for future research, the conclusions cannot compromise the audit quality, which is why audit quality constitutes such a good point of reference. Hence, this study first understands audit quality, auditor-client relationship, geographic proximity and the measurement of them. Thereafter, the study intends to examine correlation between audit quality and geographic proximity (auditor locality).

### 2.3 Geographic Proximity

The role of proximity has a long history in the literature and has been examined across a wide range of economic areas. Proximity can be subdivided into different dimensions including, organizational, technological and geographical proximity (Knoben and Oerlemans 2006). This study focuses on geographical proximity. Geographic proximity continues to play a role in the decision-making behavior of economic agents, despite the sharp decline in transportation and communication cost and vast increasing information technology (Coval and Moskowitz 1999). Two types of proximity are generally referred on the literature of economy of proximity (Gilly and Torre 2000; Kirat and Lung 1999; Rallet and Torre 2000):

- **Organized proximity** constitutes a potential that may be activated or utilized. It has to do with the different ways in which actors are close, not geographically but relationally. The qualifier “organized” refers to the arranged nature of human activities (and not to the fact that one may belong to one organization in particular); it goes beyond cognitive dimensions.

Organized proximity rests on two main logics:

*The logic of belonging* refers to the fact that two or several actors belong to one same network, or even one same web of direct or intermediated relations. It can be measured

through the degree of connectedness, connectedness which points to the existence of more or less Organized Proximity, and therefore more or less potential for interaction or common action (Gallaud and Torre, 2005).

*The logic of similarity* refers to the sharing of common mental representations. It manifests in individuals being at short cognitive distances from one another. They might be people who work on the same project, or who share cultural, religious or social values or speak a common language. Thus the logic of similarity facilitates the interactions between people who might not know one another but share the same frame of references (Gallaud and Torre, 2005).

- **Geographical proximity** is a matter of distance. In its simplest sense, it refers to the number of meters or kilometers that separate two entities (individuals, organizations, towns...). But it is relative:
  - To the physical characteristics of the space in which activities take place. There is a difference between travelling on a flat road and climbing a mountain;
  - To transport availability, the costs of transport and the income of individuals. High speed trains might allow people to travel faster from one point to another, but the cost of travelling on such trains can be prohibitive for part of the population, at least in the case of frequent travelling;

Thus, Geographical proximity is neutral in essence. It is more or less positive or negative, and potentially useful depending on human perceptions and actions. Finally, it proceeds from a judgment made by individuals or groups of individuals on the nature of the parameters that influence the geographical distance that separates them, to convert them into statements such as: “close to” or “far from”, “positive”, “negative”... this perception varies according to age, social background, gender, profession, environmental conditions.

Normally for large clients, the engagement team will go visit the audit client at the client's premises. This ensures easy communication between auditor and audit client, and generally there is the perception that face time is of value to the client. This means that the distance between audit client and performing auditor is likely to be significant and the same goes for the performing auditor and signing auditor. This fact is sparsely discussed in previous literature (Choi et al. 2010, 2012; Francis and Yu 2009, 2011) and thus this study finds it interesting to examine how proximity influences audit quality through various proxies.

The research on proximity and audit quality is limited. Yet much research on proximity on a broader scale has been conducted from which this study draw parallels (Coval and Moskowitz 2001; Kang and Kim 2008; Kedia and Rajgopal 2011; DeFond et al. 2011). Audit quality is a concern for the users of the financial statements and thus, a concern to the regulators. On these grounds this study needs to assess how, if at all, there is evidence that if you broaden the distance between the economic agents in the audit this will impact audit quality and how this should influence audit regulation, legislation, and standards.

### **2.3.1 Geographic proximity and advantages**

Prior literature indicates that, geographic proximity is related to a number of advantages. First, an advantage arising from geographic proximity is the advantage that local agents can make use of soft information. Stein (2002) defines soft information as information which is hard to put down on paper or store electronically. Petersen and Rajan (2002) use physical distance and method of communication as proxies for informational closeness and indicate the importance of the local nature of soft information for credit decisions. In addition, Liberti and Mian (2009) show that greater distance leads to less

reliance on subjective information and more on objective information. Thus, the larger the distance between agents the more difficult it is to transfer soft information. Therefore, Liberti and Mian (2009) highlighted the importance of human touch in communication. Furthermore, Agarwal and Hauswald (2010) emphasized that proximity facilitates the collection of subjective firm-specific information, which determines the quality of a bank's private information. They empirically show how banks strategically use and benefit from the advantages of information. Although, developments in communication technologies such as e-mail and videoconferencing enhance information sharing, the results of an experiment of Cramton (2001) indicate that lack of face-to-face contact causes trouble in building mutual knowledge. This is in line with other studies in psychology, communication and information systems which indicate that face-to-face communication is more effective than other forms of communication (Bordia 1997; Majchrzak et al. 2005; Vignovic and Thompson 2010).

Second, advantages which are related to geographic proximity not only entail improved information-gathering but also result in a more effective way of monitoring. Kang and Kim (2008) argue that information advantages alleviate information asymmetry between economic agents. Geographic proximity allows economic agents to visit the client firms more frequently, talk to the client's suppliers, customers and employees and assess the local market conditions in which the firm operates (e.g., Coval and Moskowitz 2001, Kang and Kim 2008). Hauswald and Marquez (2006) develop a model for the banking sector which suggests that bank's monitoring process is a decreasing function of bank-firm distance. Therefore, advantages can be derived from increasing monitoring capabilities due to geographic proximity.

Finally, transaction costs are another advantage arising from geographic proximity. Transaction costs are closely related to the increased monitoring capabilities of local agents,

while geographic proximity causes lower communication and transportation costs for monitoring local firms. Degryse and Ongena (2005) and Petersen and Rajan (2002) argue that transportation cost stimulate price discrimination in bank lending, based on the results that proximate borrowers are charged with a lower cost of capital. In conclusion, geographic proximity results in advantages including information gathering and processing advantages.

Geographic proximity in general seems to have substantial influence on knowledge transfer or knowledge acquisition (McEvily and Zaheer 1999; Aharonson et al.2007; Bell and Zaheer 2007; Tallman and Phene 2007; Torr  2008; Huggins and Johnston2010; Chetty and Michailova 2011; Stensheim 2012). Torr  (2008) made a status of existing literature arguing for the significance of proximity on innovation and co-creation. The emergence of IT (he labels it ICT for Information and Communications Technologies) he argues, has changed the environment substantially, “thus, the hypothesis that the transfer of knowledge (of tacit knowledge in particular) is facilitated by geographical proximity is largely called into question”. Though discussing a new paradigm on the transfer of knowledge, he also cites several studies for proving a hitherto too simplistic approach prevailing and exclusive of ICT (e.g., Gertler and Levitte 2005; Bell and Zaheer 2007): “... face-to-face relations, and therefore geographical proximity, are not the only possible support for the sharing of tacit knowledge ... ICTs make the long distance sharing or coproducing of tacit knowledge possible thanks to the technological evolution of computer sciences...”. In spite of his literature review, Torr  (2008) concludes his paper by defending “the thesis that, despite the validity of these new arguments, geographical proximity remains essential for knowledge transfer” - the form however has changed: ICTs mitigate for the geographical gaps and successful knowledge transfers are possible through temporary proximity (i.e., face-to-face meetings, short- or medium-term visits).

### 2.3.2 Geographic proximity and financial reporting

The advantages of geographical distance on financial decision-making are also applicable to auditing. The ability to collect soft information and the increased monitoring capabilities allow local auditors to obtain client-specific knowledge. For example, proximate auditors may be able to collect soft information, which entails better capabilities of developing knowledge about the client incentives, abilities and opportunities for opportunistic reporting. Furthermore, geographic proximity enables the auditor to monitor the client better, while they can more frequently visit client at lower cost (Choi et al. 2012). Those information advantages arising from proximity result in the fact that, local auditors can obtain more knowledge with regard to the business operations and processes, management and governance, objectives and strategies of the client. This will attribute to the understanding of the client's business and it may simplify the assessment of client business risk (Arens et al. 2012). Having the opportunity to visit the client's operations and obtaining first-hand knowledge, learning about client-specific news from local media and knowing the local regulations and market conditions, enables the auditor identify inherent risks. The research results of Bedard and Johnstone (2004) indicate the importance of knowledge in auditing, while auditors adjust the audit plan by means of increased effort and billing rates for clients with earnings manipulation risk. Not only will the first phase of a financial statement audit be influenced by more client-specific knowledge, but also the later phases.

According to Beck et al. (1988) knowledge is an important factor in the auditor's ability to detect material misstatements. In addition, literature about industry specialization shows also the importance of knowledge. Solomon et al. (1999) defines industry specialists as auditors who are designated by their firms and whose training and practice experience

are largely in a particular industry. By means of experiments they conclude that auditors with more in-depth knowledge have a greater effect on non-error knowledge than on financial statement error knowledge. Furthermore, some studies indicate that more client-specific knowledge influences the quality of the audit service. For example, Krishnan (2003) finds that clients of non-specialist auditors report a higher level of absolute discretionary accruals than client of specialists. Therefore, it can be concluded that more client knowledge mitigates accruals-based earnings management and thus influences the quality of the financial statements. Other studies associate client-specific knowledge with the length of the auditor-client relationship. Geiger and Raghunandan (2002) examine the relationship between auditor tenure and audit reporting failures and argue that auditors experience a learning curve over time. Their results confirm the explanation that audit reporting failures are more likely to occur in the initial years of an audit engagement, as a result of a lack of client knowledge. In addition, Johnson et al. (2002) report for a short auditor-client relationship higher absolute levels of unexpected accruals whereas a medium or a long auditor-client relationship results in no significant differences in the properties of the accruals. Taken together, these studies suggest that more client-specific knowledge and expertise manifest in increased audit quality.

### **2.3.3 Geographic proximity and economic agent**

Research in financial economics provides evidence suggesting that geographic proximity between economic agent matters in explaining their decision-making behavior and contractual relationship (Choi et al. 2012). Analysts who forecast earnings have been found to be more accurate when they are more geographically proximate due to an informational advantage (Malloy 2005). Studies have found that with geographic proximity



the effects of information asymmetries are reduced and the effectiveness of monitoring is increased (Kedia and Rajgopal 2011; DeFond et al. 2011). Choi et al. (2012) explain why geographic proximity or auditor locality is associated with audit quality, as being because proximity leads to better information because it makes easier for auditors to understand clients in terms of their specific incentives, abilities, and opportunities for opportunistic earnings management, and about client business risk that entails audit risks. When auditors are based locally to clients, there are more opportunities for exchanging information, which improves the standards of the auditor's knowledge that is used in evaluating client characteristics and incentives (Hong et al.2004). Moreover, as per Choi et al. (2012), having extended tenure with specific clients (Myers et al. 2003) or industry specialization (Reichelt and Wang 2010) allow auditors to be more effective in mitigating clients' aggressive accrual choices.

The consequences of geographic proximity on financial decision making in the presence of information advantages have been documented in other areas. The financing literature shows a link between geographic proximity and the consequences for particular economic agents. For example, investors have a strong bias in favor of investing close to home. According to Ivkovich and Weisbenner (2005) local investments outperform nonlocal ones, resulting in an excess return of 3.2% per year over a 1-year horizon. The local bias applies not only in an international investment portfolio but also in portfolios of domestic stocks (Coval and Moskowitz 1999). Besides the focus on investor choices and performance, distances affect the quality of information possessed by analysts. Bae et al. (2008) found economically and statistically significant evidence that local analyst have advantages even after controlling for firm and analysts characteristics. They conclude that analysts residing in

a country make more precise earnings forecasts for firms in that country than non-resident analysts.

However, the advantages analysts experience is not only applicable to the existence of national boundaries. Malloy (2005) shows evidence that analysts provide more accurate forecasts when located closer to the firm they analyze, which supports the role of distance within countries. Furthermore, other economic agents that face the advantages of geographic proximity can be found in the context of banks' lending to companies. Agarwal and Hauswald (2010) report consequences of geographic proximity for borrowers. Their results show that borrowers located further away pay higher rates. This is in accordance with the conclusions of Hollander and Verriest (2012), in which the effects of distance on debt contracting are shown. The results of the study of Hollander and Verriest (2012) suggest that lenders retain tighter covenants when borrowers seek loans from remote lenders. In sum, a number of recent studies emphasized the effect of distance on the decision-making behavior and contractual relationships of economic agents and show that information advantages can be translated into better performance.

#### **2.3.4 Geographic Proximity and auditor's independence**

DeAngelo (1981) defines the quality of audit services as the probability that an auditor will uncover the breach in the client's accounting system and report the breach. The auditor must be able to objectively evaluate the firms' performance. This adheres to the underlying assumption that a critical element of audit quality is the ability to withstand the pressure of the client to issue a client audit report (DeFond et al. 2002). The audit quality will impair if the auditor does not remain independent. As a result of recent accounting

scandals, regulators and academic researchers have paid considerable attention to this topic.

Previous research covers threats to audit independence such as client importance, non-audit services, and audit tenure. The auditor might be more willing to impair their independence as a result of the strong economic dependence (Beck et al. 1988, DeAngelo 1981). For instance, Reynolds and Francis (2001) investigate the effect of economic dependence on the auditor decision-making. They find no evidence that economic dependence stimulates Big 5 auditors to report more favorably for larger clients in their offices. Although, their results suggest that larger clients have lower magnitude and variances of accruals. Chung and Kallapur (2003) further investigate the fact that auditors' incentives to compromise independence are based on financial interest. However, they report no significant association between client importance and abnormal accruals. Some studies posit that non-audit services lead to incentives for auditors to impair their independence. When auditors deliver non-audit services to the client this may result in more economic dependence or cause conflict of interest (e.g., Ashbaugh et al. 2003; Frankel et al. 2002; Lim and Tan 2008). Other studies question the effects of audit tenure on audit independence.

The literature on audit tenure shows mixed results. If the audit tenure becomes longer the auditor may develop more extensive knowledge of the client. Therefore, longer audit tenure could result in a higher audit quality. On the other hand, longer auditor tenure may result in a close relationship with the client and this might undermine the auditors' independence (e.g., Myers et al. 2003; Knechel and Vanstraelen 2007). In sum, these studies indicate that some threats might cause auditors to impair their independence. According to Choi et al. geographic proximity might also have an effect on the independence of the auditor. One of

the threats to independence defined by the AICPA Code of Professional Conduct is familiarity. Familiarity implies the threat that auditors might be influenced by a close relationship with an auditee. A geographic proximity auditor-client relationship might result in a close relationship which is detrimental to the auditors' objectivity and hence their independence. Moreover, the study of Bamber and Iyer (2007) focus on the social forces of independence threats and they empirically model the auditor-client relationship. The results show that auditors do identify with their clients and the likelihood that an auditor will allow substandard reporting increase when they identify more closely. Even though, Bamber and Iyer (2007) find that the level of identification varies; the significant relationships involving client identification is a potential concern. If a geographic proximate auditor-client relationship has a negative effect on audit quality, it is most observable in an environment where the likelihood of giving up their independence is high (Hope and Langli 2010).

#### **2.4 Geographic Proximity and Audit quality**

It is common for economic agents to make decisions that rely on the opinion of an auditor about the quality of a firm's accounting information, and this influential role of auditors has in turn led to a wide interest in researching the effectiveness of auditors (Chaney et al. 2004). Generally, a large audit firm will service clients through whichever of its auditing offices is in the closest proximity to each client. As noted by Francis et al. (1999), it is the local engagement offices, not the national headquarters of the audit firm, that "contract for and oversee the delivery of audits" and "issue audit reports for the clients who are headquartered in the same geographical locale". The main focus of prior office-level studies has been on the questions of: (1) Whether auditor independence is impaired

for the audits of large clients by individual audit offices (e.g., Chung and Kallapur 2003; Craswell et al. 2002; Reynolds and Francis 2000); (2) Whether auditor industry expertise is more effective when firm-wide or office-specific (e.g., Ferguson et al. 2003; Francis et al. 2005b; Reichelt and Wang 2010); and (3) Whether audit quality is related to the size of the audit engagement offices (e.g., Choi et al. 2010; Francis and Yu 2009, 2011). Therefore, the specific issue of the effects of auditor-client geographic proximity on audit quality is still under-researched.

This study found only two articles directly relating to proximity and audit quality. The first study is from synthesizing on management and social psychology literature (Hanes 2013). Hanes (2013) finds an array of unique challenges within team members' coordination and communication, knowledge sharing, work design, and social identity, which inhibit geographically, distributed audit teams from effectively performing work. In another published article of Choi et al. (2012) in the US Standing on the growing body of research of the importance of geographic proximity between economic agents. Choi et al. (2012) twist the research question to examine -whether the geographic distance between auditor and client plays a role in determining audit quality. Their findings are notable in this ever globalized society: "... local auditors provide higher-quality audit services than non-local auditors." Of not less notable conclusions they find though that this quality impairment is weakened for diversified clients. Where Choi et al. examines the direct relationship between auditor and audit client, DeFond et al. (2011) examines the relationship between the probability of an auditor issuing a going concern financial audit report for financially distressed clients and the proximity to a regional SEC (U.S. Securities and Exchange Commission) office. Of special relevance for this study, DeFond et al. (2011) find supporting evidence for a risk-protection behavior of Big 4 auditors, who in turn are more likely to issue

going concern reports for clients that are headquartered further away from a SEC regional office. However, this is only true for Big 4 auditors, DeFond et al. (2011) actually find that the opposite is applicable for non-Big 4 auditors. This observation is backed by Kedia & Rajgopal (2011), who find a negative relationship between auditee-SEC geographic proximity and likelihood of financial statement restatements. This reflection suggests that, the quality control systems at the Big 4 auditors overrule some sort of opportunistic behavior embedded in the auditors. Krishnan (2003) looked at the relationship between industry expertise and audit quality. The findings were that clients of non-expert auditors reported discretionary accruals that were, on average, 1.2 % of total assets higher than discretionary accruals for clients of specialist auditors. The indication is that, specialist auditors mitigate accruals-based earnings management more than non-specialist auditors and, therefore, influence the quality of earnings. Reichelt and Wang (2010) came to similar conclusions and found that, when the auditor is both a national and a city-specific industry specialist, its clients are less likely to meet or beat analysts' earnings forecasts by one penny per share and more likely to be issued a going-concern audit opinion.

Auditor litigation risk is another notable difference between the US and Australian setting that has to be taken into consideration. The study of Ramseyer & Rasmusen (2010) concludes that compared to the high rates of litigation in the US, the rates of litigation in Australia are relatively low. While the threat of litigation is considered to deter auditors from inappropriate audit reporting, the lower likelihood of being sued may tempt an auditor to work to please the client, in an attempt to maintain their future employment in the auditing role (Gaeremyck and Willekens 2003). There may be possible differences in audit quality between local auditor and non-local auditors in countries with high and low level of litigation risk and therefore it is notable that, the study will investigate the effect

of auditor-client distance on audit quality in Australia which has lower litigation rate than US (although no direct comparison will be made).

## 2.5 Auditor-client relationship

Researcher from auditing literature (Chung and Kallapur 2003) found, in early years quality between auditor-client relations may be impaired. Another study of Carcello and Nagy (2004) examined there is no evidence between audit quality and auditor tenure. One reason could be that in early years, the auditor doesn't possess much knowledge about the client's business, operations, controls, accounting policies and systems. Another reason could be that the new auditor is unaware of the industry error patterns. Previous studies revealed a relationship between financial statement error patterns and fraudulent financial reporting. A fresh auditor having less knowledge about the client's industry prevails more to fraudulent financial reporting. Carcello and Nagy (2004) summarized a longer auditor tenure report lower than those groups who does not practice auditor rotation. Geiger and Raghunandan (2002) found a new auditor is more likely to file bankruptcy than others. Studies by Lee, Mande and Son (2009) found audit delay and efficiency is directly linked with auditor tenure and thus opposes views regarding mandatory auditor rotation and thus may incur additional costs.

## 2.6 Audit quality, auditor-client relationship and geographic proximity (auditor locality)

The primary objective of the study is to examine the impact of geographic proximity on auditor-client relationship. In doing so, this study needs to understand to what extent consensus has been reached on the definition of audit quality as this study perceives audit quality to be the mortar between the bricks. However, the effect of geographic proximity has not been adequately examined in the auditing literature. Kedia and Rajgopal (2011) examine whether the Securities and Exchange Commission's (SEC) enforcement preferences influence the likelihood that firms have to restate their prior years' financial statements. They find strong and robust evidence that countries that are geographically proximate to SEC offices have lower misreporting deviations as well as areas with greater past SEC enforcement activities. The reasoning is in a similar vein as mentioned in other areas indicating that geographic proximity lowers information asymmetries and therefore management's assessment of ex ante misreporting costs is higher for firms located nearer to SEC offices (Kedia and Rajgopal 2011). DeFond et al. (2011) also examine the effects of SEC regional office proximity but their variable of interest is the likelihood of issuing a going concern audit report for financially distressed clients. They indicate that distance affects the reporting decision of Big 4 and non-Big 4 auditors, while both are more likely to issue going concern audit reports to financially distressed clients located further away from SEC regional offices. These findings are consistent with Kedia and Rajgopal (2011).

Despite the marginal work on the role of geographic distance in auditing, it appears that geographic proximity is associated with information advantages and has consequences for decision-making behavior. In contrast to other industries, the relationship between economic agents in auditing is different. There is a triangular relationship between the



auditor, client and the financial statement user. Auditors are providing services on behalf of the client to reduce the information risk for the financial statement user. Those services can be classified as assurance services, which are independent professional services that improve the quality of information for decision makers. Assurance services are valued because the assurance provider is independent and perceived as being unbiased with respect to the information examined (Arens et al. 2012). Therefore, it is questionable if the auditor-client relationship is affected by proximity. However, Choi et al. (2012) examine geographic proximity as an engagement-specific factor in determining the auditor-client relationship and the impact on audit quality. Their expectation is that local auditors are better able to assess the clients' incentives and abilities for substandard reporting. The results confirm this expectation and indicate that local audits, associated with information advantages, have a positive impact on audit quality by constraining opportunistic earnings management. Choi et al. (2012) is the first study that provides direct evidence that auditor-client geographic proximity is an important engagement-specific factor influencing audit quality. However, they investigate the effect of proximity in the U.S. This setting entails that the auditor-client distances are large considering the size of the land. In contrast this study found, the distance between the auditor and client is much smaller than other country in Australia. The average distance has set out within 15 kilometer (in a metropolitan area). Therefore, it is more likely to find a difference between local and nonlocal auditor. Consequently, the study concluded geographic proximity is not a factor in Australian context to impair the audit quality as a whole.

## 2.7 Summary of the Chapter

Chapter two focuses on the empirical literature surrounding audit quality, geographic proximity and auditor-client relationship. The Chapter reviews the concept of audit quality and geographic proximity. It also stresses on the association between geographic proximity and other factors (audit quality, economic agent and financial reporting) along with the advantage. Finally, the impact of geographic proximity on audit quality is also discussed in Australian context when auditor-client relationship is a vital mediator.

Chapter Three will discuss the theoretical framework of this study and the empirical literature relating to the hypotheses tested. The two most applicable theories will be discussed and justified underpinning the issue of geographic proximity.

# Chapter Three

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## Theoretical perspective and hypotheses development

### 3.1 Overview of the Chapter

Chapter Two highlighted in-depth review of the literature on geographic proximity and its impacts on audit quality when auditor-client plays a vital role. A comprehensive overview on concept of geographic proximity, measure and its influence on auditing were briefly discussed. Finally, the association between the relationship with geographic proximity and economic agent, financial reporting and auditor's independence were also outlined for a better understanding of this newly added string of auditing literature (namely, geographic proximity)

Chapter Three discusses the theoretical framework of this study and the empirical literature relating to the hypotheses tested. The two most applicable theories were discussed and justified. Finally, a summary of Chapter Three is provided.

### 3.2 Theoretical perspective (Audit quality)

According to Mautz and Sharaf (1961), theories are on the demand for auditing to provide a general framework for auditing, or at least for understanding it. There are several different theories that may explain the demand for audit services. Some of them are well known in research and some of them are more based on perceptions. However, Humphrey and Scapens (1996) suggested that accounting case studied need to be more than descriptive but also need to move beyond illustrations of particular social theories or theorists. Therefore, researchers need to move beyond a reliance on a single social theorist

to illustrate the case meaningfully. This study will focus on the information advantage arising from geographic proximity in auditor-client relationship. Following prior literature this study will discuss two major economic theories underpinning geographic proximity and audit quality as a whole (Humphrey and Scapens, 1996; Goddard, 2010; Van Helden, 2005).

### **3.2.1 Information asymmetry theory and audit quality**

Information asymmetry occurs when there are discrepancies between the information insiders and outsiders are privy to, meaning that outsiders' economic decisions may be based on uncertain information (prior knowledge), increasing the potential of information risk and thus significant losses (Akerlof 1970). With the expansion and growing complexity of business over time, information discrepancy in financial statements used by both preparers and users has become a requirement for external auditing.

Recent evidence suggests (Mitra et al. 2005) richer information environment constrains opportunistic behavior of management abilities such as managing abnormal accruals. Insider trade is synonym of information asymmetry and private information. Profitability and Inside trade frequency have a negative relationship. Informative-ness of accounting information reduces the frequency of inside trading (Frankel and Li 2004; Ryan 2005). Informed trading and analysts forecasting activity depends upon the amount of disclosed information and the type of information that they impound depends on each party's information advantage, which eventually affects share prices (Piotroski and Roulstone 2004). Insiders and institutions incorporate company-specific information, whereas analysts convey industry-level information. This evidence indicates rich information environment reduces information asymmetries and thus restrict management's

opportunistic behavior. Existence of information asymmetry between managers and enterprise owners create a demand for auditors to act as an agent. In regard to the market value of enterprise there is a high information asymmetry between auditors, enterprise owners, managers and potential investors where information are confidential.

### 3.2.2 Agency theory and audit quality

Auditing confirms data validity and thus reduces gap between information asymmetry and agency. In agency theory, Principal-agent conflict illustrated as lack of reasons between principal (owner) and their agents (managers) due of information asymmetry and contradictory motives. Contradictory motives such as financial rewards, labor market opportunities, associations with other parties (not directly related to principals) can be more optimistic in entity level economic performance rather than that of whole company. Differing motivations and information asymmetries decrease reliability of information, causes breach of trust between principals and their agents. Auditor's role is to align their interests and strengthen their trust on agents. This new concept of auditors leads to breach of trust, threats to objectivity and independence. An auditing is keeping liaison between principals therefore arises similar issues of trust and confidence between director and shareholders, prompting questions about who is auditing the auditor. Without further incentives to align interest or monitoring strategies such as audit or increased regulation agents (either directors or auditors) may be trustworthy. However simple agency model recommend otherwise as managers, auditors have their own interests and motives. Independent auditor from the board of directors has huge importance on shareholders trust and is a key factor for high quality audit and therefore an audit obliges a close working

relationship with the board of directors of a company. Hence fostering this close relationship raises question of auditor independence and quality (The Institute of Chartered Accountants in England & Wales, 2005).

An agency theory perspective also suggests that the principal-agent relationship may be associated with information asymmetry. The agent, with greater access in company information does not necessarily available to the principal without a cost. The agent has the opportunity to use this information to his/her own advantage and this raises question regulation accounting and financial reporting. The signaling theory, based on “lemon problem” (Akerlof 1970), explains how information asymmetry affects financial information voluntary supply. Owners frequently use account number to monitor contractual obligations and restrict managers’ power to promote personal interests (Watts and Zimmerman 1979). Accounting numbers must be prepared with regulated standards and monitored; otherwise they are of little use. The role of auditing is associated with conflict of interests and information asymmetry and thus has a significant role in monitoring agency contracts.

### **3.3 Theory Selection**

As described in the previous subsections there are two suitable theories underpinning the study’s earnings management practice out of other widely established economic theories (agency theory, institutional theory, stewardship theory, resource dependency theory, stakeholder theory and information asymmetry theory). Each theory has its own individual perspective and application. However, prior study suggests agency theory and information asymmetry theory provide most relevant theoretical framework for

investigating the relationship between auditor-client geographic proximity and audit quality (Choi et al., 2012). According to Akerlof (1970) information asymmetry deals with the study of decisions in transactions where one party has more or superior information than other and agency problem arise as a result of information asymmetries and differing motivation between principals (shareholder) and agents (corporate management) (Jensen and Meckling1976). Since, this study focuses on the informational advantage arising from geographic proximity between Auditor-client relationships therefore agency theory and information asymmetry theory consider to be the most relevant theory which describe the topic accordingly.

### **3.4 Developing hypotheses (Geographic proximity and its impact of audit quality)**

Prior studies in the marketing literature focused on spatial distribution of buyers and seller and the physical distribution cost, whereas more recent marketing studies focus on the role of geographic proximity in inter-firm relations (Ganesan et al. 2006). The effects of distance are also documented in the financing literature, in which the importance of proximity has been emphasized for investor's portfolio management (e.g., Coval and Moskowitz 1999;Ivkovich and Weisbenner 2005), equity analysis (e.g., Bae et al. 2008; Malloy 2005) and debt contracting (Agarwal and Hauswald 2010; Hollander and Verriest 2012). These studies indicate that geographic proximity affects the decision making behavior and the contractual relationships between particular economic agents. In addition, previous studies about audit quality document various engagement-specific factors (e.g., non-audit services and auditor tenure) that influence auditors' independence and thus audit

quality. Geographic proximity might also have an effect on the independence of the auditor. One of the considerable threats to independence defined by the APESB (Accounting Professional & Ethical Standard Board) Code of Professional Conduct is familiarity. Familiarity implies the threat that auditors might be influenced by a close relationship with an auditee. A geographic proximity auditor-client relationship might result in a close relationship which is detrimental to the auditors' objectivity and hence their independence. If a geographic proximate auditor-client relationship has a negative effect on audit quality, it is most observable in an environment where the likelihood of giving up their independence is high (Hope and Langli 2010). Therefore, this study focuses on the influence of distance on the auditor-client relationship and the effect on audit quality. Theoretically, closer proximity should enable auditors to develop better knowledge about client-specific incentives and abilities, as well as client-specific opportunities for substandard reporting, which in turn should lead to local auditors being able to more effectively monitor client reporting behavior and reduce bias in financial reporting. Based on the above arguments in the literature, the hypothesis to be empirically tested in this study is as follows:

**H1: Audits performed by local auditors are of higher quality than audits performed by non-local auditors, other things being equal.**

The literature has found that in some circumstances, the advantages of local auditing will be diminished, for example, when client firms are dispersed beyond the headquarters through having a number of operating divisions or geographic segments (Choi et al. 2012). The problem for the auditors is that potentially insightful relationships, such as through continuing face-to-face interactions is difficult for auditors if a firm's executives and other



employees are scattered, especially in a large country like Australia. Choi et al. (2012) suggested that audit quality is higher when an auditor services less diversified client firms, because it allows a greater proportion of their information to be accessed from the corporate headquarters which is a relatively more informed source than when the information sources are more diversified. To further examine the robustness and validity of H1, this study also tends to investigate the notional effect of locality at different levels of States (partitioning test).

### Conceptual Schema for the variables:

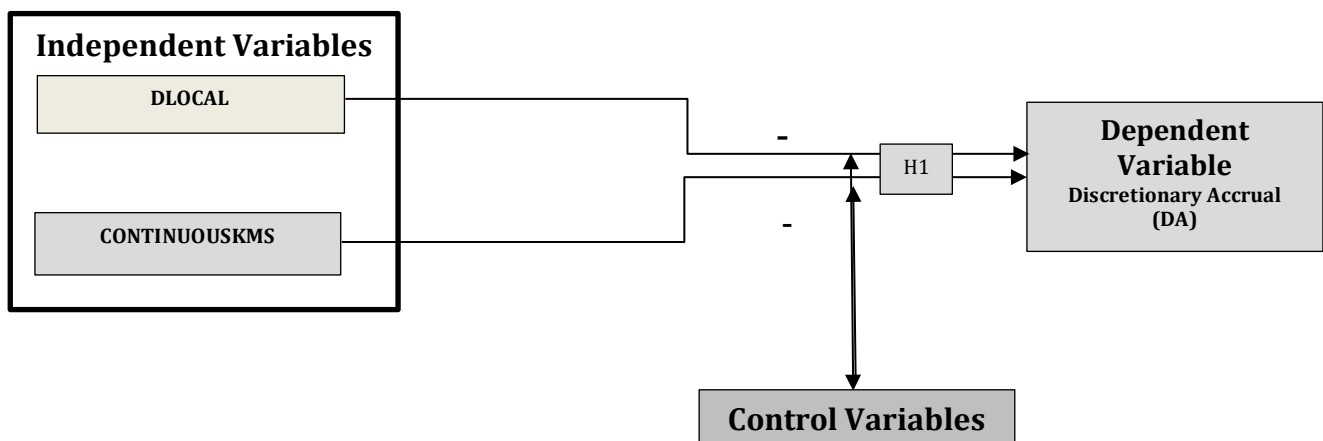


Fig: The relationship among the variables when discretionary accrual used as a proxy for audit quality.

### 3.5 Summary of the Chapter

Chapter Three provided the main underlying theoretical perspective of the study. This Chapter also justified the association of the suggested theory to the aspect of geographic proximity and auditor-client relationship in detailed, resulting in the formulation of hypothesis (H1) of the study.

Chapter Four will discuss detail of the research method applied in this study. Initially, Chapter Four discussed about the sample, documentation and time period allocated for the study. Consequently, the Chapter will also explore the main variables (dependent, independent and control) used for statistical test and models to examine the hypothesis of this study.

# Chapter Four

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## Sample Selection, Data and Time Period

### 4.1 Overview of the Chapter

Chapter Three discussed the theoretical framework of this study and the empirical literature relating to the hypothesis tested. The two most applicable theories were discussed and justified to the topic (impact of geographic proximity on audit quality).

Chapter four discusses the sample selection for this study including the sources and justifications. This chapter will also elaborate the measurement of dependent, independent and control variables of the study. Finally, a summary of Chapter Four is provided.

### 4.2 Selection Justification

This study investigates if geographic proximity affects audit quality in the Australian setting. While prior research investigates the effect of proximity in the US (Choi et al. 2012), it is interesting to identify if such relationship exists in countries with different characteristics. Therefore, the research question in this study is tested for a sample based on Australian companies for four consecutive year (2010-2013).The data collection for this study involves the review and analysis of published information for the public companies listed on Australian Securities Exchange (ASX). ASX had over 2379 companies (2010-2013), spread across all industry sectors and a range of geographical regions. Since, listed companies provide readily available information in an appropriate useable form therefore only 1962 listed (Australian) companies are taken from the Morningstar Database for initial usable sample. Consistent with prior research the 271 financial institutions and utility firms

with SIC codes in the range 4010-4040 and 5510 respectively, are also excluded from the sample as the financial statements of such firms are subject to special accounting regulations and discretionary accrual models do not apply to them (Choi et al. 2012; Chung and Kallapur 2003). Additional 44 companies are deleted due to unavailability of annual reports and foreign ownership as their total asset base and financial structure is not comparable to those of the other companies (the audit report is signed in an overseas jurisdiction and does not necessarily identify the audit partner, Clifford and Evans 1997). The final sample for the study then consists of 1647 company. At this stage using Random.org website this study performed a random sampling program to extract final 540 samples. The reason for using this particular website is, unlike the other random number generator program the randomness of the mentioned program comes from atmospheric noise, which for many purposes is better than the pseudo-random number algorithms typically used in computer programs (Random.org 2000). This study instructed the program to generate 540 uniquely random numbers from minimum of 1 to maximum of 1647 number. After extracting the 540 random number from the program this study then downloaded only five years (to calculate lagged year effect this study initially has taken the data from 2009-2013) of data for those randomly numbered company from the excel Morningstar Database. However, companies those have an indication of missing data for the observation period were also excluded (Klein 2002a, 2002b) from the final usable 540 sample. Hence, 20 companies were also deleted from the final sample, leaving the final usable sample with 520 company (2080 observations) located in 8 states audited by 45 auditors.

### 4.3 Source Justification

In order to collect the financial data required for measuring the discretionary accruals this study used number of resources. Morningstar Database is one of the most useful databases where this study sourced major share of its time series financial data. Morningstar DatAnalysis Premium which combines the capabilities of the former Morningstar DatAnalysis and FinAnalysis. DatAnalysis Premium provides comprehensive coverage of financial data for all ASX listed firms and reports are updated daily from ASX announcements. Audit information (auditor tenure, audit fees, non-audit fees) is collected from Sirca Corporate Governance Database. This study also obtains hand collected data for audit fees and non-audit fees for 35 percent company of the sample size. Overall data for control variables are collected from Connect 4 Database, Sirca, S&P Capital IQ, and Morningstar DatAnalysis Premium.

Furthermore, the variable of interest the geographic location of the auditor is determined by means of retrieving the address of the client from annual reports of Morningstar Database. The annual report also contains an independent audit report which is signed off by the engagement partner. Following prior research the location of signing is used to extract the city of the auditors' practicing office (Defond et al. 2011; Choi et al. 2012). Subsequently, it is determined in which state the auditor is located and this is compared with the client firms' headquarters location that is obtained from the Morningstar Database (corporate address). When the auditor and the client are vested in the same state, the auditor is classified as a local auditor. Following previous literature, this study used the physical distance between a firm and its auditor as measure of geographic proximity. In particular, Haversine formula (Sinnott 1984) has been used to calculate the physical distance which uses the actual latitude and longitude information for the address.

**Table 4.1 Variable Description Table with source:**

**Variable Description Table:**

Variable	Definition	Database
<b>Independent</b>		
DMS100	Indicator variable for auditor location. DMS100 is zero if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same State metropolitan area, and one otherwise.	Data for location of auditors' practicing offices and client firms' headquarters was extracted from Morningstar database. Geographical location of the auditor is determined by means of retrieving the annual reports from connect4. The annual reports contain an independent audit report which is signed off by the engagement partner. The location of signing can be used to extract the city of auditors practicing office.
Continuouuskms	Continuouuskms is the actual physical distance between the client and the auditor. This study uses Continuouuskms as an alternative proxy of auditor locality for measuring audit quality.	
<b>Dependent</b>		
DA	Absolute value of discretionary (abnormal) accruals, as estimated by modified Jones (1991) model	Residual from the regression
<b>Control</b>		
LNTA	Natural log of total assets in thousands of dollars	Morningstar
BIG4	If the auditor is one of the Big 4 firms that equals 1 and 0 otherwise	Connect4/SIRCA
CHGSALE	Change in sales deflated by lagged total assets	Morningstar
LOSS	If the firm reports a loss for the year that equals 1 and 0 otherwise	Morningstar
LEV	Total liabilities divided by total assets	Morningstar
NAS	Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees	Connect4/SIRCA
INDSPEC	An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the state where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for a state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the State that serve the same industry	Connect4/SIRCA
ZMIJ	Zmijewski's (1984) financial distress score, winsorized at 5 and -5	Morningstar
CFO	Operating cash flows, taken from the cash flow statement, deflated by lagged total assets	Morningstar
LAGACCR	One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset	Morningstar
CONCENT	A measure of auditor concentration by each MSA	Connect4/SIRCA
TENURE	Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm	Connect4/SIRCA

#### **4.4 Time Period Selection**

This study involves a pooled analysis covering 2010 to 2013 calendar years. This time-frame is selected as the time-frame revolves around key periods in the financial accounting and corporate governance landscape in Australia involving the revisions made to the ASX CGCs corporate governance guidelines, the implementation of CLERP 9 recommendations, and the adoption of IFRS. The current version (3rd) of the ASX CGCs Corporate Governance Principles and Recommendations with 2010 amendments has been effective from 1 January 2011. Revisions to the corporate governance guidelines have been made with an intention of improving general business practices and financial reporting quality (Australian Securities Exchange Corporate Governance Council (ASX CGC) 2007, 2010) which in turn is expected to impact auditor quality/ Discretionary accrual linkage. All revisions to ASX CGCs will be captured in the sample period 2010 - 2013. The time-frame is also chosen to obtain the timeliest information available.

#### **4.5 Measurement of Dependent (Discretionary Accruals)**

Despite the fact that a large stream of literature focuses on audit quality, the concept remains complex and is not easy to define (Francis 2011; Knechel 2012). As audit quality is difficult to measure, previous studies use proxies for audit quality such as going-concern qualifications (Knechel and Vanstraelen 2007), restatements (Kinney et al. 2004) or accrual-based earnings quality (e.g., Becker et al. 1998; Chung and Kallapur 2003; Myers et al. 2003; Reynolds and Francis 2001). Going-concern opinions and restatements are extreme measures of audit quality because they do not address audit quality differentiation for a

broad cross section of firms (Choi et al. 2012). As a result those measures can lead to a lack of statistical power in empirical tests. Therefore, this study uses accrual-based earnings management (Discretionary Accrual) as a proxy for audit quality as this proxy has been widely used by range of scholars in US and in Australia (Subramanyam 1996; Becker et al. 1998; DeFond and Subramanyam 1998; Guidry, Leone, and Rock 1999; Bartov, Gul, and Tsui 2000; DuCharme, Malatesta, and Sefcik 2004; Habib, Bhuiyan, and Islam 2013 ; Davidson, Goodwin-Stewart, and Kent 2005; Hamilton et al. 2005; Koh and Hsu 2005; Coulton, Ruddock, and Taylor 2007). Several measurement models are developed to determine the discretionary accruals for example, the Healy Model (1985), the DeAngelo Model (1986), the Jones Model (1991), the Modified Jones Model and an Industry model. Dechow et al. (1995) evaluate these accrual-based models for detecting earnings management and they report that although, all the models appear to be well specified to a random sample of firm-years, the Modified Jones model exhibits the most comprehensive manner to explain discretionary accrual. Furthermore, modified Jones model has been extensively used in both US (Subramanyam 1996; Becker et al. 1998; DeFond and Subramanyam 1998; Guidry, Leone, and Rock 1999; Bartov, Gul, and Tsui 2000; DuCharme, Malatesta, and Sefcik 2004; Habib, Bhuiyan, and Islam 2013) and Australia (Davidson, Goodwin-Stewart, and Kent 2005; Hamilton et al. 2005; Koh and Hsu 2005; Coulton, Ruddock, and Taylor 2007) over the decade to measure magnitude of earning management .Therefore, in this study the modified version of the Jones Model is used in the empirical analysis. The Modified Jones Model makes a distinction between discretionary accruals (DA) and non-discretionary accruals (NDA). The discretionary accruals are that part of accruals that are assumed to be managed by managers. Therefore, the magnitude discretionary accruals are regarded as an outcome of opportunistic earnings management in the literature (Chung and Kallapur2003;



Frankel et al.2002). The non-discretionary accruals are the accruals which are explained by changes in firms' economic circumstances. When a firm has high level of discretionary accruals this means that management has a lot of discretion in determining earnings and is able to manipulate the earnings number.

#### 4.5.1 Approach adopted in calculating discretionary accruals

Equation 1 reflects the components used in the Modified Jones Model for generating the discretionary accruals. Following previous literature this study performs a separate regression for each GICS industry group with at least ten observations in a single financial period (Choi et al. 2012). Current study covers eight GICS industry group and four financial years (2010-2013) which will generate a maximum of 36 separate cross-sectional regressions for each model.

$$\text{Accr}_{jt} / A_{jt-1} = \beta_1 (1/A_{jt-1}) + \beta_2 ((\Delta\text{REV}_{jt} - \Delta\text{REC}_{jt})/A_{jt-1}) + \beta_3 (\text{PPE}_{jt}/A_{jt-1}) + \varepsilon_{jt} \quad (1)$$

Where:

For firm j and in year t (or t-1): Accr<sub>jt</sub> = total accruals, (=PreTax Profit (Earnings before extraordinary items and discounted operation of firm)-Net Operating Cash flow), A<sub>jt-1</sub> = total assets, ΔREV<sub>jt</sub> = change in revenues, ΔREC<sub>jt</sub> = change in receivables, PPE<sub>jt</sub> = gross property, plant and equipment

The residuals generated from the regressions are discretionary accrual (DA) before adjusting for firm performance. Furthermore, to estimate total accrual this study uses cash-flow statement approach over balance sheet approach. Prior studies indicates balance sheets approach often caught influenced by firms economic attribute, thus have more power to deter earning management of the firm (Collins and Haribar2002 )

## 4.6 Measurement of the independent variables

The variable of interest is the geographic proximity of the auditor-client relationship. In order to define the auditor-client distance, the auditor location is based on the location of the audit engagement office. This is due to the fact that the office-based engagement partner issues the audit opinion rather than the national headquarters (Ferguson et al. 2003; Francis and Yu 2009). The information to determine the location of the engagement partner will be obtained from the annual report. The annual report includes an independent audit report, which is signed off by the engagement partner. It is assumed that the location of signing is the location from which the engagement team performs the audit. Based on prior studies about geographic proximity the client firm location is determined through their corporate headquarters (Coval and Moskowitz 1999; DeFond et al. 2011). Therefore, the distinction between a local auditor and a non-local auditor can be made by classifying an auditor as a local auditor if the auditors' practicing office is located in the same geographic area as the clients' headquarters. The variable included in the regression model which proxies for auditor-client geographic proximity is DMS100. A negative coefficient on DMS100 indicates that clients of local auditors on average report a lower level of absolute discretionary accruals than those of non-local auditors and therefore obtain a higher audit quality. However, higher levels of absolute discretionary accruals are expected if geographic proximity results in an impairment of audit independence.

### 4.6.1 Local/Nonlocal Auditor

Following prior research, location of the audit engagement office can be used as auditor location because it is an office based engagement partner or audit team unlike

national headquarters (Choi et al. 2012). Consequently, location of corporate headquarters can be used as the client firm location. In prior studies, scholar differentiated auditor's locality in two ways: First when the audit engagement offices are located in the same Metropolitan statistical area (MSA) as audit clients are headquartered they considered that relationship as a local auditor to the client (DLOCAL=1) and as a non-local auditor otherwise (DLOCAL=0) (Choi et al. 2012). The second way of measuring local to nonlocal auditor is based on distance (kilometer), when an auditors engagement office is located within 100 km from clients headquarters can be defined as local and nonlocal otherwise or if both the audit office and client headquarters are located in the same Metropolitan statistical area (DMS100=1), and as a non-local auditor otherwise (DMS100=0).

In Australia, the Australian Bureau of Statistics defines 'statistical divisions' as areas under the unifying influence of one or more major towns or a major city (ABS 2008). Including Canberra, the national capital, each of the state and territory capital cities forms its own statistical division, and the population of the statistical division is calculated as the city's population. However, conurbation of several statistical divisions into a larger metropolitan area has changed the definition of city's population. For example, the City of Brisbane, the capital city of Queensland, has long since become contiguous with the surrounding cities of Ipswich, Logan City, Redland City, Redcliffe, Pine Rivers, Caboolture and the Gold Coast (ABS 2008). Including all the capital cities and many major regional centers such as the Gold Coast, Newcastle, Wollongong, Geelong, Townsville, Cairns and Toowoomba conurbation is common to all the major metropolitan areas of Australia. .

However, the list of Australian cities by population provides rankings of Australian cities according to various systems defined by the Australian Bureau of Statistics (ABS 2008). Firstly, they are ranked by Greater Capital City Statistical Area (for capital cities) and

Significant Urban Area (for other cities). They are also ranked by Urban Centre and by Local Government Area (known internationally as 'city proper'). Greater Capital City Statistical Areas/Significant Urban Areas by population. Each capital city forms its own Greater Capital City Statistical Area (GCCSA), which according to the Australian Bureau of Statistics (ABS) represents a broad socioeconomic definition of each of the eight state and territory capital cities. These correspond to the more common and international usage of metropolitan areas. Since, each State area can be viewed as a geographic boundary in which most social and economic interactions between community members take place, this study adopts the State area based differentiation in an Australian settings.

As a result, an auditor is a local auditor as the audit engagement office is located in the same State area as where the clients are headquartered. The variable included in the regression model which proxies for auditor-client geographic proximity is DMS100. In this study local to non-local auditor will be differentiate following prior research (Choi et al. 2012) when an auditor's engagement office is located within 100 km from client's headquarter can be defined as local and nonlocal otherwise or if both the audit office and client headquarter are located in the same State (DMS100=0), and as a non-local auditor otherwise (DMS100=1).

As far as study's concerned, the geographic proximity may have a constant value since from the usable sample it was assumed that most sample firms are located in the same State (95 percent of the auditor found local) where the engagement auditor is vested. In the study of Choi el al. (2012) the descriptive studies presented that, the average percentage of local audit in each MSA area varies, which suggests- the choice for an auditor is not concentrated in a specific region. Therefore the possibility of having local auditor (DMS100=0), the constant value is higher as the sample data already shows the major share

of the local auditor. However, to elevate this concern this study will take an alternative measurement like: taking the continuous distance (kilometer) and changing the local auditor parameter cap (15km, 30km, 50km, 75km) in terms of measuring auditor locality as a part of sensitivity test.

#### **4.6.2 Natural log of the sum of the number of business and geographic segments**

##### ***(LNBGS)***

The variable LNBGS is included to control the fixed geographic segment effects of the study according to prior study (Francis and Yu 2009). LNBGS represents the natural log of the sum of the number of business (520 firms) and geographic segments (8 State) minus 1. If business or geographic segment data for a given observation are missing from the database, a value of 1 will be assigned, following Francis and Yu (2009). Thus, the minimum LNBGS is 0 (i.e.,  $\log(2-1) = 0$ ).

**Table: 4.2**Details of Variables with expected sign

Details of Variables with sign Table:

Variable	Definition	Expected sign
<b>Independent</b>		
<b>DMS100</b>	Indicator variable for auditor location. DMS100 is 0 if the distance between the audit office and the client firm’s headquarters is less than 100 kilometers, or if the audit office and the client firm’s headquarters are located in the same State metropolitan area, and 1 otherwise.	(-)
<b>Continuouskms</b>	Continuouskms is the actual physical distance between the client and the auditor. This study uses Continuouskms as an alternative proxy of auditor locality for measuring audit quality	
<b>Control</b>		
<b>LNTA</b>	Natural log of total assets in thousands of dollars	(-)
<b>BIG4</b>	If the auditor is one of the Big 4 firms that equals 1 and 0 otherwise	(-)
<b>CHGSALE</b>	Change in sales deflated by lagged total assets	(+)
<b>LOSS</b>	If the firm reports a loss for the year that equals 1 and 0 otherwise	(+)
<b>LEV</b>	Total liabilities divided by total assets	(+)
<b>NAS</b>	Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees	(?)
<b>INDSPEC</b>	An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the state where the auditor is located, and 0 otherwise. This study will calculate each audit firm’s industry market share of audit fees for a state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the State that serve the same industry	(-)
<b>ZMIJ</b>	Zmijewski’s (1984) financial distress score, winsorized at 5 and -5	(+)
<b>CFO</b>	Operating cash flows, taken from the cash flow statement, deflated by lagged total assets	(-)
<b>LAGACCR</b>	One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset	(-)
<b>CONCENT</b>	A measure of auditor concentration by each State	(-)
<b>TENURE</b>	Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm	(-)

## 4.7 Measurement and justification for inclusion of Control Variable

The regression model also uses control variables known to affect the magnitude of discretionary accruals that have been used in prior studies (e.g., DeAngelo 1981; Francis et al. 1999; Sori et al. 2006; Choi et al. 2010 ; Dechow and Dichev 2002; Lee and Mande 2003; Davidson 1993; Lennox 1999; Colbert and Murray 1999).

### 4.7.1 Natural log of total assets (*LNTA*)

One control variable is the Natural log of total assets (*LNTA*) that controls for the size of the auditee, because larger firms tend to have higher accruals quality and most of the case they have lower proportion of discretionary accruals (Dechow and Dichev 2002; Lee and Mande 2003). Several studies support the evidence that size of the office impacts audit quality. Difficulty in measuring audit quality led numerous researchers to utilize audit firm size as an alternative (Davidson 1993). Greater the firm's size the greater the audit quality (e.g., DeAngelo 1981; Francis et al. 1999; Sori et al. 2006; Choi et al. 2010). Big audit firms are more independent from their customers and have the resources innovating new technology to discover breach in accounting reporting system, errors and manipulation. DeAngelo (1981) hypothesizes larger firms provide usually has higher quality audits. She also argues that the big firms are more independent from their customer, thereby increasing the likelihood of identified breach reporting. In 1999, Francis et al. asserted that the international Big 6 (became Big 4 in 2002) auditing firms have brand-name reputations and are widely viewed as higher quality audits producer than non-Big 6 firms. Sori et al. (2006) observed, big audit firms have more talented employees, superior technology, research facilities and best financial resources to undertake audit process than smaller audit firms.

Big firms possess incentives to deliver high quality audits, and their partner human capital is highly motivated to maintain its reputation (Colbert and Murray 1999). Over a span of more than three decades many studies have been conducted and those studies suggest the hypothesis that a big firm has greater technical expertise to provide higher quality audit process, greater credibility to customers' financial statements and thus enjoy better reputation, brand quality and been viewed as have greater independence. The perception about big firm is clearly supported by several researchers (e.g., DeAngelo 1981; Davidson 1993; Lennox 1999; Colbert and Murray 1999; Sori et al. 2006). This study measures LNTA by the natural log of total assets in thousands of dollars (using exponential function).

#### **4.7.2 Auditor Tenure (*TENURE*)**

Another important control variable included is *TENURE* which Johnson et al. (2000) and Myers et al. (2003) used in their study that showed lower abnormal accruals reported by clients of longer-tenure auditors. Some researchers suggest the existence of a strong relationship between audit quality and auditor tenure (e.g., Arel et al. 2005; Jackson et al. 2008; Chi et al. 2009). After issuance of Sarbanes-Oxley (SOX) in 2002, which refers to the mandatory rotation of auditors from five to seven years (SOX, 2002, section 207) this view has experienced an increased growth. However, among researchers there is no agreement about the impact of auditor tenure on audit quality. Some researchers argue a long auditor rotation has a negative impact on audit quality (Geiger and Raghunandan 2002; Arel et al. 2005; Chi et al. 2009). Collapse of two firms Enron and Andersen gives a strong support to this argument. A long and intimate relation between employees of both this companies led to the collapse (Arel et al. 2005). Moreover, this long relationship may lead the auditing firm



to behave with the interests of their customer's management, affects independent auditing processing and thus quality is compromised (Geiger and Raghunandan 2002). Similarly, Chi et al. (2009) argue that mandatory audit rotation reinforces auditor independence in appearance. In contrast, other researchers argue that long auditor rotation has a positive impact on audit quality (George 2004; Ghosh and Moon's 2005; Arel et al. 2005; Knechel and Vanstraelen 2007; Jackson et al. 2008). Jackson et al. (2008) argue that the length of audit rotation actually leads to stronger audit quality and costs reduction. According to Ghosh and Moon's (2005) imposing limits on the auditor-customer relationship incur additional cost on capital markets. George (2004) argued lack of customer and their business specific knowledge puts an auditor at higher risks for conducting an effective audit. Knowledge of the customer and their business environment is something can only be obtained through experience and thus in the first year audit failures are generally higher. Over time as the auditor-customer relationship grows so does the failure rate declines (Arel et al. 2005). In order to comprehensively capture the influence of audit engagement partner tenure on earnings management practices, following prior research this study focuses on continuous measures of auditors tenure (Fargher, Lee and Mande 2008). For the purpose of the main analysis this study, measures TENURE as the natural log of the number of years the incumbent auditor has served the client firm.

### 4.7.3 Big4 (*BIG4*)

The control variable BIG 4 is used following findings by Becker et al. (1998) and Francis et al. (1999) of smaller discretionary accruals than clients of non-Big 4 auditors. An extensive branch of audit differentiation research focuses on the quality of the client's financial statements, in which discretionary accruals are often used as a proxy for audit quality, as they reflect the auditor's constraint over management's reporting decisions (Lawrence et al. 2011). Becker et al. (1998) find that Big 4 clients report lower absolute discretionary accruals than non-Big 4 clients. Francis et al. (1999) suggest that Big 4 auditors constrain opportunistic and aggressive reporting because their clients have higher total accruals but lower discretionary accruals. Krishnan (2003) finds a greater association between discretionary accruals and future earnings for Big 4 than for non-Big 4 clients. For auditor quality, the dichotomous variable BIG4 is used in this study where the variable BIG4 represent the top big four auditors namely, KPMG, E&Y, PWC and Deloitte. In terms of measurement, therefore, a client firm is scored one (1) if in the time period the engaged auditor is a Big4 auditor. Otherwise the client firm in time period is scored zero (0).

### 4.7.4 Industry Specialization (*INDUSPEC*)

Another variable INDUSPEC is also included together with BIG 4 to control for the effect of auditor brand name at the national level and industry expertise at the same State level following prior research (Choi et al., 2012). Over the years, there have been enormous evidence and research conclusion that industry specific audit service enables gaining financial savings and better audit quality. On 1998, Hogan and Jeter found evidence of association between industry experience and audit quality. Schauer (2002) identifies

industry knowledge affects audits quality. Cadman and Stein (2007) advocated industry specialized audit firm provide a quality audit with a higher fees on average. Meyer (2009) found auditors developed industry specific knowledge assist them to achieve higher quality audit than non-specialist auditor. Reichelt and Wang (2010) explained how industry specialized auditing tool provided quality service and financial gain for their customer. These specialized tools enable them to practice better audit quality and more conservative in their audit practices. Moroney and Carey's (2011) research found industry experience has a more impact on audit quality than task-based experience.

Following previous research (Choi et al. 2012; Krishnan 2003) this study will use the auditor's industry market share approach to calculate industry expertise which estimates the auditor's portfolio shares. In particular, this study will calculate each audit firm's industry market share of audit fees for a State (geographical location of auditor's locality) as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the State that serve the same industry. Therefore, auditor industry expertise equals 1 if the audit firm is the industry leader for the audit year in the audit market of the State where the auditor is located, and 0 otherwise.

#### **4.7.5 Change in Sales (*CHGSALE*)**

Albrecht and Richardson (1990) argued the firms which are prone to high rate of Sales change might experience economic uncertainty down the track. Also following Skinner and Sloan (2002) investigation of not meeting earnings forecasts for growth firms, the variable change in sales (*CHGSALE*) is included to control for the positive effects firm growth on the level of accruals. This study measure *CHGSALE* as Change in sales deflated by total

lagged assets following prior scholars (Srinidhi and Gul 2007; Dichev and Tang 2009; Gopalan and Jayaraman 2012)

#### 4.7.6 Loss (*LOSS*)

A dummy variable *LOSS* is included because loss making firms have a greater incentive to increase earnings in order to minimize reported losses; *LOSS* can also be used for the control of potential differences in earnings management between loss and profit firm (Choi et al. 2012). According to Carey and Simmet (2006) firm with continued losses are more likely to fail. Coulton et al (2005) posits that Australian managers often claim that they manage earnings (report losses) to avoid a negative earning change or surprise. Another research by Holland and Ramsey (2003) reports the similar result for Australian firms which are also in line with the current study showing 68 percent of the sample size reports loss. In this study, the variable *LOSS* controls for whether the firm experienced a loss, an indicator variable that is set to equal one (1) in the fiscal year (2010-2013) if net income is negative and zero (0) otherwise.

#### 4.7.7 Firm Leverage (*LEV*)

The variable leverage (*LEV*) is included, because highly levered firms have more incentives to engage in earnings management due to their concerns of debt covenant violations (Becker et al. 1998; DeFond and Jiambalvo 1994). According to Jiang et al. (2008), leverage changes impacts on earning management practices. In general, leverage of the firm shows its debt structure therefore high leverage firms tend to manipulate earnings either positive to avoid debt covenant violation or negative to obtain better negotiation from

other economic agents (Watts and Zimmerman 1978; Dechow and Skinner 2000; DeAngelo et al.1994). Following prior literature this study measures LEV as the ratio of total liability to total assets (Balsam et al. 2003; Krishnan et al. 2007)

#### **4.7.8 Non Audit Services (NAS)**

The variable NAS was also included to control for the effect of non-audit fees on audit quality (Ashbaugh et al. 2003; Chung and Kallapur 2003; Frankel et al. 2002). From Quick and Rasmussen (2005) analysis on the Enron case it became evident that provision of non-audit services (NAS) can endanger auditor independence. This hypotheses also signifies with various research conducted by professional bodies, academics and researchers such as Defond et al. 2002; Rasmussen 2005; Felix et al.2005. Big audit companies now providing their customers more non audit services (NAS) which estimate 30 percent to 40 percent of their revenues (Walker 1999). Many researchers argue that NAS weaken objectivity and auditor independence but others found no conclusive evidence on association between NAS and audit quality (Frankel et al. 2002; Kilgore 2007; Salehi 2009). Researchers are concerned mainly on two effects of NAS (Defond et al. 2002). First, fear that NAS fees might make auditors dependent on their customers hence lack of willingness to stand up against management pressure and losing business. Second, auditor might find themselves in a managerial role due to the nature of many NAS and threatening their independence about the audit transactions. Felix et al. (2005) argue that when auditors provide NAS to audit clients, the level of client pressure increases and they become less concerned with the internal audits quality, and that this situation influences the decisions made in the gathering of audit evidence, and the audit process. In Australia, the regulation requires extensive

disclosures to be made by the financial report audit on the type of non-audit services provided, justifying why the provision of the non-audit services did not impair audit independence (Gay and Simnett 2009). In this study, non-audit services (NAS) measured as the ratio of the natural log of non-audit fees over the natural log of total Audit fees.

#### 4.7.9 Zmijewski Score

Furthermore, the model of Zmijewski (1984) is used to control for the effects of financial distress (Reynolds and Francis, 2000). Specifically, this study uses Zmijewski's (1984) financial distress prediction model based on: return on assets, financial leverage, and liquidity, and the PROBIT coefficients from his 40 bankrupt / 800 non-bankrupt estimation sample. This model is used because of its generalizability (Choi et al. 2012). Higher Z-scores indicate greater financial distress, so a positive relation is expected between Z-score and discretionary accruals. Present study computes the Z-score using amounts reported in financial statements extracted from Morningstar Database. Zmijewski's (1984) financial distress score is measured in following manners:

Zmijewski Score =  $-4.336 - 4.513 * (\text{Net Income} / \text{Total Assets}) + 5.679 * (\text{Total Liabilities} / \text{Total Assets}) + 0.004 * (\text{Current Assets} / \text{Current Liabilities})$  (where for firm  $j$ , and for year  $t$ ). In this model a higher Z-score indicates a greater probability to go bankrupt. Following prior research Z-score is winsorized at -5 and 5 (Choi et al. 2012).

#### 4.7.10 Cash flow from operations (CFO)

Cash flow from the firms operation is taken from the cash flow statement and deflated by the lagged total assets following prior literature (i.e., Fargher et al. (2008); Sun

and Rath (2009); Chung and Kallapur 2003). The study of Dechow et al. (1995) for example, shows a negative correlation between cash flow from operations and accruals. Firms with liquidity problems may have a higher likelihood to engage in earnings management (Choi et al. 2012). Therefore, the control variable cash flow from operations (CFO) is included. Based on prior studies a negative sign is expected (Ashbaugh et al. 2003; Choi et al. 2012; Francis and Yu 2009).

#### **4.7.11 Lagged Accrual (LAGACCR)**

To control for variations in the reversal of accruals over time the variable lagged accruals (LAGACCR) is included. Generally, accrual anticipated future economic benefit for the firm, therefore changed feature of lagged accrual may have impact on earnings management (Dechow 1994; Dechow et al. 1995; Krishnan et al. 2011). Although some Australian research found a negative relationship between earning management and lagged accrual (Koh 2003) but other found positive relationship (Coulton et al.2007). However, this study expects a predicted negative sign as majority of the scholar (Koh 2003; Koh and Hsu 2005; Krishnan et al. 2011) found an adverse relationship between lagged accruals and earning managements.

#### **4.7.12 Auditor Concentration (CONCENT)**

Following Kallapur et al. (2010) the variable concentration (CONCENT) is included to control for the effect of auditor concentration. They argued that “within a single country, variations in audit market concentration can be obtained across city markets, markets segmented by client size, or industry”. Furthermore, Kallapur et al. (2010) found that

concentration measured by the Herfindahl index at the Metropolitan statistical area (MSA) level is positively associated with proxies for audit quality (they applied discretionary accrual as a proxy for audit quality). In this study, the concentration is measured for each State area (this study uses State instead of MSA as the geographical distribution is different than other country) using the Herfindahl index based on aggregate size of client firms' assets. A negative relationship between concentration and discretionary accruals is expected, suggesting that audit quality is higher in more concentrated audit markets.

#### **4.8 Summary of the Chapter**

Chapter Four outlined the research method used to test the underlying hypotheses of current study. Initially, selection of the sample size, source and period justification are explained in details. Then this study introduced us with the dependent, independent and control variable of current research.

Chapter Five will discuss about the descriptive statistics and basic univariate analysis of the sample with correlation matrix.



# Chapter Five

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## Descriptive statistics and Univariate analysis

### 5.1 Overview of the Chapter

Chapter Four used to address the sample collection and subsequent selection process. The previous Chapter also outlined the measurement of variables and relationship among the variables.

In chapter Five, this study reviews the descriptive statistics for the variables. Furthermore, data cleaning, sample selection procedure, industry breakdown, State wise sample breakdown, local auditor breakdown, kilometer wise auditor breakdown and average distance breakdown by State will also to be discussed in this Chapter.

### 5.2 Data Cleaning

Prior to data analysis, data screening checks are undertaken for each of the variables used in the study. The entire process is guided by the preliminary plan of data analysis, which was formulated in the research design phase. Cleaning the data requires consistency checks and treatment of missing responses; generally done through any software (this study uses STATA). Consistency checks serve to identify the data, which are out of range, logically inconsistent or have extreme values. The missing responses are treated carefully to minimize their adverse effects by assigning a suitable value (neutral or imputed) or discarding them methodically (case wise or pair wise deletion). In this study missing responses was not a problem as their proportion to the total was insignificant (not more than 10 percent, Hair et al. 1995).

## 5.3 Sample Descriptive Statistics

### 5.3.1 Sample selection procedure, industry breakdown and distance wise client breakdowns

As discussed in Chapter Four the sample selection procedure, which is presented in Table 5.1, ASX had over 2379 companies (2010-2013), spread across all industry sectors and a range of geographical regions. Of these, only 1647 listed companies are taken from the Morningstar. Consistent with prior research the 271 financial institutions and utility firms with GIC codes in the range 4010-4040 and 5510 respectively, are excluded from the sample. Additional 44 companies are deleted due to unavailability of annual report and foreign ownership. Out of 1647 company this study then run a random sampling program to extract final 540 samples. Companies that have an indication of missing data for the observation period (for the regression model) will also be excluded likewise 20 companies were also lost results in a final sample that consists of 520 firm (2080 firm-year observations) for the year 2010-2013, of which 1144 observations with positive discretionary accruals and 936 observations with negative discretionary accruals.

**Table 5.1 presents the sample selection procedures**

Model: Discretionary accrual	Year 2010-2013
Initial sample with available data for total accruals	<b>2379</b>
-Delisted companies of ASX	417
-Financial(242) and Utility(29) Companies	271
-Annual report not available	44
Sample Pool for Random Selection	<b>1647</b>
Companies selected from random sampling	<b>540</b>
Observations with missing data for Modified Jones model(1991)	20
Final Sample: Of which: 286 companies with positive discretionary accrual 234 companies with negative discretionary accrual	520

**Table 5.2 presents the industry wise breakdown of the sample in 2010**

ASX Industry	No of Client	Percentage
Consumer Discretionary	54	10%
Consumer Staples	18	3%
Energy	67	13%
Health Care	44	9%
Industrials	60	12%
Information Technology	32	6%
Materials	233	45%
Telecommunication Services	12	2%
Total	520	100%

Table 5.2 provides information of the industry breakdown of full sample this study. The table shows highest proportion of the industry share holds by Material (45%) which is mining industry of Australia for the year 2010. Australian economy is dominated primarily by resource and consumer services (Sun and Rath 2009). This industry classification essentially mirrors the nature of Australian economy therefore can avoid self-selection bias. In the sample breakdown, Energy and Industrial secured the consequent places (13% and 12%). The representation of firms within each industry is proportionally representative of the ASX market as a whole (for this study) and therefore, each industry contains enough observations to control for the industry effects in the subsequent multivariate analysis. Hence, the selected sample can truly reflect earnings management practices in Australia (if there any exist due to auditor locality).

Table 5.3 provides information on the locations of clients and auditors in full sample of the study. Column (1) of Panel-A of Table 2 reports the number of clients in each State. Column (2) reports the number of local audits performed by audit offices located in the same State as their clients. Column (3) shows the average percentage of local audits in each State. The percentage varies across States, suggesting that the choice of non-local auditors is not concentrated in certain States. This study finds about 95 percent of audits are carried out by auditors located in the same State, and about 95 percent are by auditors located within 100 kilometers. Panel B reports the number of observations by the distance between the audit office and client headquarters. It is clear from Panel B that most of the local auditors are within 15 km from client offices, contrary to the previous literature (Choi et al. 2012). Therefore, it is to be examinable that as distance settings of Australia is certainly different as of the US (and other countries), the hypothesis result whether or not comes as expected as prior research. Panel C of Table 5.3 provides more detailed auditor location information for 520 clients located nationwide. It shows that about 5 percent of the clients in the State hire auditors from other States, and about only 5 percent of the clients hire auditors located farther than 100 kilometers from their headquarters. It is noteworthy that some clients in the NT hire auditors located far away, such as from the NT (1292.23 kilometers away, on average), and TAS State (8690.20 kilometers away). In contrast, some auditors come from nearby area comparing to others, such as the NSW State (128 kilometers away) and WA State (137 kilometers away) both have the largest client sample. These auditors are likely to share the characteristics of the local auditors to the client firms even though they are not located in the same State. This is why this study defines D100 as a combined variable of the distance-based and State-based measures and uses it to proxy for local audits.

**Table 5.3 Panel- A (No of Local Client)**

State	No of Client	No of Local Client	Percentage of local Client
ACT	1	1	100%
NSW	129	121	94%
NT	1	0	0%
QLD	49	46	94%
SA	15	14	93%
TAS	2	1	50%
VIC	95	88	93%
WA	228	220	97%

**Table 5.3 Panel- B (Distance between Clients and Auditors)**

0-15 kms	16-25kms	26-35kms	36-50kms	51-100kms	100> kms
430	35	16	3	9	28

**Table 5.3 Panel- C (Average distance between Clients and Auditors)**

State	No of Client	Average Distance (Kms)
ACT	1	7.04
NSW	129	127.66
NT	1	1292.23
QLD	49	123.97
SA	15	145.96
TAS	2	8690.20
VIC	95	115.44
WA	228	136.86

### 5.3.2 Descriptive Statistics

Table 5.4 provides the descriptive statistics for the variables of the regression model. It shows that the absolute value of discretionary accruals is on average 0.288 and has a median of 0.090. These findings represent an average magnitude of earnings management to be around 28% of total assets in Australian listed firms. However, this statistic is not in line with the findings in the prior studies, which use the absolute discretionary accruals as their dependent variable (Sun and Rath 2009; Fargher, Lee and Mande 2008). Australian studies show that the mean for discretionary accruals varies from 12% to 18% of total asset of listed firm (Hamilton et al. 2005; Davidson, Goodwin-Stewart, and Kent 2005; Sun and Rath 2009; Fargher, Lee and Mande 2008). Whereas in the US study most of the research shows the mean for absolute discretionary accruals varies from 8% to 13% of total asset (Frankel et al. 2002; Choi et al. 2012; Kallapur 2010). Table 5.4 also reports the 1<sup>st</sup> quartiles and 3<sup>rd</sup> quartiles of the study where current research found some comparable figure with previous Australian study by Fargher et al. (2008), wherein the 1<sup>st</sup> and 3<sup>rd</sup> quartiles of the absolute values of discretionary accruals were reported to be 0.0318 and 0.2020 which is similar to current study (0.032 and 0.201). The average discretionary accruals for the study is bit higher comparing to other Australian study, one of the reason could be the characteristics of firms structure. Sun and Rath (2009) found a strong association between earning management and individual firm characteristics. Their study posits that, firms which are small in size and less profitable are most likely to engage in earning management. In this study we ran a random selection of our sample therefore, our average firm size is not more than \$10 million (minimum 3 million) and more than 68 percent of our sample report losses. The variable of interest DMS100 has a mean of 0.053, indicating that only 5 per cent of the firms in the sample have an auditor who is not located in the same MSA (State). The average

client size (LNTA) is 10.18 which is equivalent to \$ 10 million total assets, the table also shows maximum of \$17 million and minimum of \$3 million (contrast to Fargher et al. 2008, where they reported average \$17 million, minimum \$10 million and maximum \$ 25 million). About 39 per cent of the clients are audited by one of the BIG 4 auditors (BIG4), therefore around 39 percent client engaged PWC, E&Y, KPMG and DTT. The average logged auditor tenure is (TENURE) is 1.65, which is interpreted as about two years of auditor tenure and maximum of 2.5 years. Another characteristic of the sample firms are that the sample firms are in financial distress as 67 per cent is reporting a loss. As a result, financial leverage is about 15 per cent of total assets and the operating cash flows are negative of lagged total assets. On average, non-audit service fees (NAS) are about 23 percent of total fees, and about 12 percent of clients hire industry specialists (INDSPEC).

**Table 5.4 Descriptive statistics**

Variable	Mean	Standard deviation	Median (p50)	p75	Maximum	p25
DA_abs	0.2882	1.4407	0.0985	0.2014	38.8337	0.0496
LNBGS	6.2653	0	6.2653	6.2653	6.2653	6.2653
DMS100	0.0538	0.2257	0	0	1	0
LNTA	10.1867	2.2538	9.8614	11.4471	17.5803	8.7991
BIG4	0.3918	0.4882	0	1	1	0
TENURE	1.6582	0.5919	1.7917	2.0794	2.5649	1.3862
NAS	0.2362	0.3873	0	0.7124	1.2536	0
INDSPEC	0.1250	0.3307	0	0	1	0
CHGSALE	0.0082	3.5022	5.2506	0.0843	90.4525	-0.0379
LOSS	0.6754	0.4683	1	1	1	0
LEV	15.4435	166.85	0.1990	0.5206	3743.828	0.0471
ZMIJ	85.0599	949.37	-2.2352	-0.4012	21263.29	-3.4016
CFO	-0.2057	0.8716	-0.0573	0.0476	2.8069	-0.2149
CONCENT	0.0174	0.0687	0.0070	0.0174	1	0.0023

**Where:**

DA<sub>jt</sub>= Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQ<sub>jt</sub> = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100<sub>jt</sub> = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the same State, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBGS<sub>jt</sub> = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBGS is 0; i.e., log (2 - 1) = 0 (where for firm j, and for year t). LNTA<sub>jt</sub> = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4<sub>jt</sub> = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENURE<sub>jt</sub> = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NAS<sub>jt</sub> = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPEC<sub>jt</sub> = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALE<sub>jt</sub> = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSS<sub>jt</sub> = 1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEV<sub>jt</sub> = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJ<sub>jt</sub> = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFO<sub>jt</sub> = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEV<sub>jt</sub> = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCR<sub>jt</sub> = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENT<sub>jt</sub> = A measure of auditor concentration by each state, (where for firm j, and for year t).

**5.4 Pearson Correlations**

The Pearson correlations between all variables included in the regression model are presented in Table 5.5. Table 5.4 includes the absolute value of discretionary accrual as a proxy of measuring audit quality calculated using modified Jones models. From the correlation matrix it is observable that, the variable of interest DMS100 is positively correlated with the discretionary accruals.. The review of the correlation matrix from table 5.5 highlights a number of observations. First, the absolute discretionary accruals is significantly correlated with number of control variables like natural log of total assets (LNTA) and operating cash flow (CFO). This correlation supports their inclusion as a control variable. Second, it is noticeable that the control variable natural log of total assets (LNTA) is



correlated with almost every other control variable except Z-score (ZMIJ) which supports previous research (Francis and Yu 2009; DeFoand and Zhang 2013) as large audit offices provide higher quality as measured by discretionary accruals. Finally, from the table 5.5 it is observable that the correlation between ZMIJ and LEV is above the critical limit of multi-collinearity (.9999) (Hair et al. 1995). However, multivariate analysis was performed both including and excluding these variables and results remain unchanged. Therefore, high multi-collinearity is not a substantial concern for this study.

**Table 5.5 : Pearson correlation among all variables.**

	DA_abs	dms100	Inta	big4	tenure	nas	indspec	chgsale	loss	lev	zmij	cfo	lagaccr	concent
DA_abs	1													
dms100	0.0222	1												
Inta	<b>-0.1465</b>	0.0341	1											
big4	0.0014	<b>-0.0649</b>	<b>0.493</b>	1										
tenure	-0.016	-0.0052	<b>0.2259</b>	<b>0.3015</b>	1									
nas	-0.0405	0.0098	<b>0.4988</b>	<b>0.34</b>	<b>0.1038</b>	1								
indspec	0.0011	-0.0193	<b>0.342</b>	<b>0.45</b>	<b>0.1797</b>	<b>0.2162</b>	1							
chgsale	0.0286	0.003	<b>0.067</b>	0.0122	-0.0234	0.0135	-0.0017	1						
loss	0.0313	0.0107	<b>-0.5552</b>	<b>-0.2956</b>	<b>-0.1203</b>	<b>-0.3653</b>	<b>-0.1882</b>	-0.0387	1					
lev	0.0191	0.0051	<b>-0.119</b>	-0.0128	0.0435	-0.0428	0.011	-0.0075	0.0359	1				
zmij	0.0194	0.0049	<b>-0.1211</b>	-0.0128	0.0435	<b>-0.0432</b>	0.0109	-0.0085	0.0382	<b>0.9999</b>	1			
cfo	<b>-0.5382</b>	-0.0302	<b>0.2957</b>	<b>0.065</b>	<b>0.0499</b>	<b>0.1148</b>	0.0258	<b>-0.1534</b>	<b>-0.251</b>	-0.0822	<b>-0.0839</b>	1		
lagaccr	<b>-0.2188</b>	-0.0151	<b>0.0876</b>	0.0058	0.0201	0.0121	-0.0173	<b>0.1391</b>	<b>-0.1216</b>	0.0023	0	<b>0.4422</b>	1	
concent	0.0126	<b>0.0932</b>	<b>-0.048</b>	0.0262	<b>0.0484</b>	-0.014	0.0074	0.0018	0.0181	0.0128	0.0127	-0.0105	0.0259	1

**Where:**

DA<sub>jt</sub>= Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQ<sub>jt</sub> = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100<sub>jt</sub> = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the sameState, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBSG<sub>jt</sub> = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBSG is 0; i.e., log (2 - 1) = 0 (where for firm j, and for year t). LNTA<sub>jt</sub> = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4<sub>jt</sub> = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENURE<sub>jt</sub> = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NAS<sub>jt</sub> = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPEC<sub>jt</sub> = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALE<sub>jt</sub> = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSS<sub>jt</sub> = 1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEV<sub>jt</sub> = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJ<sub>jt</sub> = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFO<sub>jt</sub> = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEV<sub>jt</sub> = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCR<sub>jt</sub> = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENT<sub>jt</sub> = A measure of auditor concentration by each state, (where for firm j, and for year t).

## 5.6 Summary of the Chapter

Chapter Five looked at the descriptive statistics for the data examined in this study. Final usable sample and industry breakdown was also outlined for the sake of complete sample overview. This chapter also reported the Pearson correlation matrix and for the test of hypothesis t-tests were also discussed subsequently.

In Chapter Six, this study will discuss about the main regression result for the research, where absolute discretionary accrual is the dependent variable to regress with independent variable DMS100 and other control variable.

## Multivariate analysis and regression

### 6.1 Overview of the chapter

Chapter Five discussed descriptive statistics with tables and univariate analysis with result of this study. Pervious chapter also reported Pearson's correlation, which exhibited in general the control variables are not highly correlated.

Chapter Six intends to discuss the main empirical result of current study. The result of the regressions will examine the impact of geographic proximity on audit quality. The analysis is performed for a sample of 2080 firm-year observation from 2010-2013 and a comparison of the analysis is outlined in this chapter followed by a summary.

### 6.2 Regression Analysis

A multiple regression analysis is performed for this study since the concentration of the study is on examining the effect of auditor locality (independent) variable on absolute discretionary accrual (audit quality proxy) as a dependable variable. This study used modified jones model as a proxy of measuring discretionary accrual (audit quality). Initially, to examine the geographic proximity two different measure were applied, DMS100 (local auditor/nonlocal auditor) and Continuous Kms (actual physical distance between client and auditor). In this chapter the study will report the regression result for these two different measures.

### 6.2.1 Using Modified Jones model measuring absolute discretionary accrual when geographic proximity measured on DMS100

The results of the multivariate tests are presented in Table 6.1. Column 1 of Table 6.1 reports the regression results for the model with absolute value of discretionary accruals as dependent variable. The F-statistic of the model is significant ( $F=18.39$ ;  $p = 0.000$ ) at 1% level and 65 percent of the variation in the dependent variable is explained by the model since the goodness-of-fit (adjusted R squared) is 0.649. In Column 2 and 3 Table 6.1 splits the sample into firms, having positive discretionary accruals which are indicators for income increasing earnings management and firms having negative discretionary accruals indicating income decreasing earnings management. According to Sun and Rath (2009)-“Large value of discretionary accruals are conventionally interpreted as evidence of earning management”, therefore, it is to be assumed that- the Australian firms do not engage in earning manipulation under null hypotheses. Hence, the mean and median of discretionary accruals are expected to be zero. This study considers both absolute and signed value of discretionary accrual to capture the dynamic nature of the accrual component following previous literature (Sun and Rath 2009). The sign of direction indicates the position of earning management. The regression models of the subsamples are also significant, respectively ( $F= 2729.97$ ;  $p= 0.000$  and  $F= 7328.84$ ;  $p= 0.000$ ). About 99 percent of the variation in discretionary accruals is explained with the positive and negative discretionary accruals.

The coefficient of interest DMS100 doesn't have the expected negative sign. Only the model with positive discretionary accruals has an expected negative sign. A lower level of DA indicates a higher audit quality, so a negative sign suggests that local auditors better deter management from engaging in earnings management than non-local auditors. The

model with negative discretionary accruals in which the variable DMS100 has a positive sign (contrast with previous study, Choi et al. 2012), indicating that local auditors do not deter management from engaging into income decreasing earnings management. This may suggest that local auditors' impair independence for clients with negative discretionary accruals. However, in none of the samples the coefficient of DMS100 is significant. This indicates that the level of discretionary accruals is not significantly affected by the geographic proximity of the auditor. Based on this result, it cannot be concluded that auditors who are located in the same geographic area as the clients' headquarter perform a higher audit quality. The hypothesis that local auditors perform lower/higher audit quality than non-local auditors must be rejected.

Furthermore, the coefficients on the control variable of LNTA, BIG4, TENURE, LOSS, CFO, LAGACC and CONCENT are in line with the evidence reported in prior research about earnings management. For example, the variable LNTA is significant in the model with Positive discretionary accruals and Negative discretionary accruals respectively ( $\beta = -0.006$ ,  $p=0.000$ ;  $\beta = -0.021$ ,  $p=0.000$ ), indicating that larger firms tend to engage in a lower extent to earnings management (Dechow and Dichev 2002). Consistent with previous Australian research that small sized firms more tend to engage in earning management (Fargher et al. 2008; Krishnan et al. 2011).

The sign is expected for the coefficient for BIG4 for both absolute discretionary accruals and negative discretionary accruals model but p-values are not significant. However, in contrast with prior literature the positive discretionary accruals model has a positive sign (Becker et al. 1998; Francis et al. 1999). This result suggesting that, a client firm engaging a BIG4 auditor will not necessarily have lower discretionary accrual than a client firm engaging a non-BIG4 firm.

It is notable that the variable TENURE has an expected negative sign for absolute discretionary accruals model and the model negative discretionary accruals found statistically significant ( $\beta = 0.031$ ,  $p=0.000$ ) with an opposite sign. The direction indicates that a client with longer tenure tends not to engage in earning management comparing to client with short audit tenure (Carey and Simnett 2006).

The mean coefficient estimate on change in sales usually ambiguous (Sun and Rath 2009) because a given sales change could either is sales increasing (account receivable) or sales decreasing (account payable). In this study, for the model absolute discretionary accruals the coefficient of CHGSALE is positive and not significant. However, for the other two models (positive and negative discretionary accruals) the coefficient estimate found positive and statistically significant respectively ( $\beta = 0.171$ ,  $p=0.000$  and  $\beta =0.177$ ,  $p=0.000$ ). Hence, this underlying result indicates that, change in sales is associated with income increasing or income decreasing accrual in this study.

It is observable that, the effect of the variable LAGACCR in the model with positive discretionary accruals and negative discretionary accruals in which they are significant in the opposite direction as expected. Therefore, it is assumable that there is a relationship exists between discretionary accrual and lagged year accrual following previous literature (Kallapur et al. 2010).

Following prior research the control variable CFO found significant ( $\beta =-0.595$ ,  $p=0.001$ ) at 1 percent level (Fargher et al. 2008; Sharma et al. 2011; Hamilton et al. 2005) indicates that cash flow from operation has a positive relationship with managerial desecration of earning management.

The control variable LOSS is found significant ( $\beta =-0.389$ ,  $p=0.000$ ) at 1percent level with an opposite sign then expected for the model absolute discretionary accrual. However

model with negative discretionary accrual is also found significant ( $\beta = 0.030$ ,  $p = 0.006$ ) at 1 percent level with an expected sign which is in the line of previous study (Sharma et al, 2011; Kallapur et al. 2010).

It is interesting to note that, the control variable Auditor Concentration is also found significant at 1 percent ( $\beta = 0.277$ ,  $p = 0.000$ ) and 5 percent ( $\beta = -0.053$ ,  $p = 0.025$ ) respectively for the model positive and negative discretionary accrual. This result is in the line of previous scholar research (Kallapur et al. 2010). In their study Kallapur et al. (2010) found a positive association with auditors' concentration and accrual quality (discretionary accrual).

The other control variables of this study namely, LEV, NAS, INDSEC, ZMIJ are not statistically significant at 10 percent level when regressed against absolute value of discretionary accrual.

### **6.2.1 Using Modified Jones model measuring absolute discretionary accrual when geographic proximity measured on Continuous-kms (Continuous distance)**

This study intends to employ another measure of geographic proximity due to insufficient percentage of non-local auditor observation (that most sample firms are located in the same State where the engagement auditor is vested). From the descriptive study we concluded only 5 percent sample were found nonlocal auditor. To elevate the concern of local auditor concentration, this study will employ another proxy to measure the physical distance (kilometer) between the auditor and client and in that way geographic proximity will always have different values. In the study of Choi et al. (2012), the descriptive studies presented that, the average percentage of local audit in each MSA area varies, which suggests- the choice for an auditor is not concentrated in a specific region.



The results of the multivariate tests are presented in Table 6.2. Column 1 of Table 6.1 reports the regression results for the model with absolute value of discretionary accruals as dependent variable. The F-statistic of the model is significant ( $F=18.94$ ;  $p = 0.000$ ) at 1% level and 65 percent of the variation in the dependent variable is explained by the model since the goodness-of-fit (adjusted R squared) is 0.65. In Column 2 and 3 Table 6.1 splits the sample into firms, having positive discretionary accruals which are indicators for income increasing earnings management and firms having negative discretionary accruals indicating income decreasing earnings management. The sign of direction indicates the position of earning management. The regression models of the subsamples are also significant, respectively ( $F= 2620.29$ ;  $p= 0.000$  and  $F=7447.95$ ;  $p= 0.000$ ). About 99 percent of the variation in discretionary accruals is explained with the positive and negative discretionary accruals.

The coefficient of interest CONTINUOUSKMS have the expected negative sign and significant at 5 percent and 10 percent respectively ( $\beta =-0.000$ ,  $p=0.013$ ;  $\beta =0.000$ ,  $p=0.065$ ) for the model positive discretionary accruals and negative discretionary accruals. However, the coefficient of variable is zero for all three models therefore the models are not statistically significant. It is notable that the model with negative discretionary accruals doesn't have an expected negative sign with a significant result. A lower level of discretionary accrual indicates a higher audit quality, so a negative sign suggests that local auditors better deter management from engaging in earnings management than non-local auditors.

The model with negative discretionary accruals in which the CONTINUOUSKMS variable has a positive sign (contrast with previous study, Choi et al. 2012), indicating that local auditors do not deter management from engaging into income decreasing earnings

management. This may suggest that local auditors' impair independence for clients with negative discretionary accruals. However, the coefficient for the model positive and negative discretionary accruals found insignificant (as coefficients are zero) which is not in the line of prior literature (Choi et al. 2012). This indicates that the levels of discretionary accruals are not significantly affected by the geographic proximity of the auditor. Based on this result, it is to be concluded that auditors who are located in the same geographic area as the clients' headquarter do not necessarily perform a higher audit quality in Australian context. The hypothesis that, local auditors perform lower/higher audit quality than non-local auditors can be rejected based on the result of test variable CONTINUOUSKMS.

Furthermore, the coefficients on the control variable of LNTA, BIG4, TENURE, LOSS, CFO, LAGACC and CONCENT are in line with the evidence reported in prior research (Fargher et al. 2008; Krishnan et al. 2011; Dechow and Dichev 2002; Becker et al. 1998; Francis et al. 1999; Carey and Simnett 2006; Sun and Rath 2009; Kallapur et al. 2010; Fargher et al. 2008; Sharma et al. 2011; Hamilton et al. 2005) about earnings management and results are same as the other measure of DMS100.

Finally, the other control variables of this study namely, LEV, NAS, INDSEC, ZMIJ are not statistically significant at 10 percent level when regressed against absolute value of discretionary accrual.

**Table 6.1 Present regression result for association between auditor locality (DMS100) and the level of discretionary accruals**

Variables	Expected Sign	Model with absolute value of discretionary accruals		Model of Positive discretionary accruals		Model of Negative discretionary accruals	
		Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
dms100	(-)	0.041	[0.58]	-0.001	[-0.22]	0.017	[1.35]
lna	(-)	-0.029	[-1.23]	-0.006	[-3.60] ***	-0.021	[-7.55] ***
big4	(-)	-0.003	[-0.08]	0.001	[0.23]	-0.003	[-0.36]
tenure	(-)	-0.023	[-0.93]	0.002	[0.49]	0.031	[3.63] ***
nas	(?)	0.012	[0.32]	-0.006	[-1.17]	-0.012	[-0.96]
indspec	(-)	0.019	[0.60]	0.005	[0.93]	0.020	[1.60]
chgsale	(+)	-0.058	[-0.71]	0.171	[102.56] ***	0.177	[155.97] ***
loss	(+)	-0.389	[-5.89] ***	-0.002	[-0.41]	0.030	[2.76] ***
lev	(+)	0.049	[0.99]	0.000	[0.48]	-0.002	[-1.06]
zmij	(+)	-0.009	[-0.99]	-0.000	[-0.42]	0.000	[1.06]
cfo	(-)	-0.589	[-3.19] ***	-0.048	[-6.20] ***	0.017	[0.88]
lagaccr	(-)	-0.595	[-4.09] ***	1.000	[82.29] ***	1.005	[159.40] ***
concent	(-)	0.517	[1.37]	0.277	[6.88] ***	-0.053	[-2.26] **
Constant	(?)	0.542	[2.59] **	0.129	[5.85] ***	0.192	[5.73] ***
Industry & Year	(?)	Included	Included	Included	Included	Included	Included
Observations		2,076		1,140		936	
R-squared		0.65		0.99		1.00	
Adj. R-squared		0.65		0.99		1.00	

t-statistics in brackets denote significance level at the \*\*\* 1%, \*\*5%, \* 10% of p-value

**Where:**

DAjt= Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQjt = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100jt = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the sameState, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBSjt = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBS is 0; i.e., log (2 - 1) = 0 (where for firm j, and for year t). LNTAJt = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4jt = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENUREjt = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NASjt = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPECjt = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALEjt = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSSjt =1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEVjt = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJjt = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFOjt = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEVjt = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCRjt = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENTjt = A measure of auditor concentration by each state, (where for firm j, and for year t).

**Table 6.2 Present regression result for association between auditor locality (CONTINUOUSKMS) and the level of discretionary accruals**

Variables	Expected Sign	Model with absolute value of discretionary accruals		Model of Positive discretionary accruals		Model of Negative discretionary accruals	
		Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
Continuous distance	(-)	-0.000	[-0.75]	-0.000	[-2.49]**	0.000	[1.85]*
Inta	(-)	-0.029	[-1.21]	-0.006	[-3.59]***	-0.021	[-7.54]***
big4	(-)	-0.006	[-0.15]	0.001	[0.24]	-0.004	[-0.42]
tenure	(-)	-0.023	[-0.94]	0.001	[0.38]	0.032	[3.67]***
nas	(?)	0.013	[0.36]	-0.006	[-1.17]	-0.011	[-0.92]
indspec	(-)	0.021	[0.66]	0.006	[1.06]	0.021	[1.62]
chgsale	(+)	-0.058	[-0.71]	0.171	[102.90]***	0.177	[155.91]***
loss	(+)	-0.389	[-5.89]	-0.003	[-0.46]***	0.031	[2.86]***
lev	(+)	0.049	[0.99]	0.000	[0.49]	-0.002	[-1.03]
zmij	(+)	-0.009	[-0.99]	-0.000	[-0.42]	0.000	[1.03]
cfo	(-)	-0.589	[-3.20]***	-0.048	[-6.27]***	0.017	[0.90]
lagaccr	(-)	-0.595	[-4.10]***	0.999	[82.33]***	1.005	[160.26]***
concent	(-)	0.547	[1.39]	0.286	[7.87]***	-0.054	[-2.31]**
Industry and Year	(?)	Included	Included	Included	Included	Included	Included
Constant	(?)	0.541	[2.59]***	0.129	[5.87]***	0.191	[5.75]***
Observations		2,076		1,140		936	
R-squared		0.65		0.99		1.00	
Adj. R-squared		0.65		0.99		1.00	

t-statistics in brackets denote significance level at the \*\*\* 1%, \*\*5%, \* 10% of p-value

**Where:**

DA<sub>jt</sub> = Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQ<sub>jt</sub> = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100<sub>jt</sub> = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the same state, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBSG<sub>jt</sub> = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBSG is 0; i.e., log(2 - 1) = 0 (where for firm j, and for year t). LNTA<sub>jt</sub> = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4<sub>jt</sub> = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENURE<sub>jt</sub> = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NAS<sub>jt</sub> = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPEC<sub>jt</sub> = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALE<sub>jt</sub> = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSS<sub>jt</sub> = 1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEV<sub>jt</sub> = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJ<sub>jt</sub> = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFO<sub>jt</sub> = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEV<sub>jt</sub> = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCR<sub>jt</sub> = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENT<sub>jt</sub> = A measure of auditor concentration by each state, (where for firm j, and for year t).

### 6.2.3 Comparison of the results

Table 6.1 and 6.2 reports the regression result of discretionary accruals where modified Jones model were used as a proxy of audit quality measurement. This study used two measures of variable of interest DMS100 and CONTINUOUSKMS. Each study has three different models of predicting discretionary accrual following previous literature (Sun and Rath 2009; Kallapur et al. 2010)

As can be seen from table 6.1 and 6.2, independent variable DMS100 and CONTINUOUSKMS both found insignificant. These underlying results between two different independent variables suggesting that- distance cap used for geographic proximity for other country might not be appropriate for Australian settings (where 95 percent auditors hired locally). This indicates that the level of discretionary accruals is not significantly affected by the geographic proximity of the auditor in Australia.

The other control variable of LNTA, BIG4, TENURE, LOSS, CFO, LAGACC and CONCENT are in line with the evidence reported in prior research about earnings management and results are same in both measures (positive discretionary model and negative discretionary model) of independent variable.

### 6.3 Summary of the Chapter

Chapter Six discussed the main empirical result of current study. The result of the regressions were examined the impact of geographic proximity on audit quality. The analysis is performed for a sample of 2080 firm-year observation from 2010-2013 and a comparison of the analysis is outlined in this chapter. The study used two measures to examine the

auditor locality on audit quality and result was insignificant for both of the measures, suggesting a rejection of the hypothesis of present study.

Next chapter will focus on the robustness and sensitivity test of the study. In Chapter Seven this study will try to use other alternative measures of the test variable by partitioning the distance using different kilometer cap and subdividing samples by the concentration of economic activity.

# Chapter Seven

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## Robustness and Sensitivity analysis

### 7.1 Overview of the Chapter

Chapter six provided the overview of the result of regressions examining the association between audit quality (discretionary accruals) and geographic proximity between client and auditor. This study uses modified Jones model to estimate the dynamic nature of discretionary accruals following previous literature (Choi et al. 2012). The association between auditor locality and audit quality were examined using two different measures (DMS100, CONTINUOUSKMS). Finally, the result found insignificant for both measures.

Chapter Seven discusses the robustness and sensitivity of the main result discussed in earlier chapter. Here in Chapter Seven, this study will try to use other alternative measures of the test variable by partitioning the distance using different kilometre cap and subdividing samples by concentration of economic activity of the state.

### 7.2 Sensitivity tests and robustness of the study

A number of additional tests are performed to determine the robustness of the results. First, an alternative measure is used for determining the variable of interest. Instead of differentiating local auditors from non-local auditors using the State's metropolitan area in which they are located, the distinction is made based upon the actual geographic distance. The alternative measure provides additional insight about the geographic proximity of the auditor-client relation. This is required while the State's metropolitan area

differentiation ignores the fact that when a client's headquarter is located at the geographic boundary of the State's metropolitan area; the audit office in an adjacent State's metropolitan area might be more proximate. Especially in the East of the Australia a high degree of concentration is observable in the number of State's metropolitan areas. For this reason, an alternative approach is used in which an auditor is defined as local auditor.

Based on prior studies, the distance is computed between the centers of the two cities where the auditors' offices and clients' headquarters are located (Choi et al. 2012; Kedia and Rajgopal 2011). The actual geographic distance is established in kilometers based on the data obtained from Morningstar database and the collected auditor location from the annual reports (Chapter Four explains in detail about the measurement of auditor locality). To differentiate a local auditor from a non-local auditor a cutoff value is used. However, the distances between the economic agents in the Australia are much smaller than in the samples of prior studies which are based on the US setting, therefore a different cutoff value is used. Instead of following Choi et al. (2012) and Kedia and Rajgopal (2011) , who used the cutoff value of 100 kilometers, this study uses the cutoff value of 15km, 25km, 35km, 50km and continuous kilometers. These dummy variables for DMS100 are highly correlated with the State's metropolitan areas indicator variable, indicating that they measure the same construct namely the geographic proximity between the auditor-client relationships.

The regression results for the different proxies of defining a local auditor are presented in table 7.1. With respect to the discretionary accruals the results of these sensitivity analyses are approximately similar to the tabulated results in Table 6.1 and 6.2.

The coefficient of DMS100 remains insignificant. However, the results suggest that the sign of the variable DMS100 coefficient becomes positive while a different cutoff values



(25km, 35km or 50 kilometer) were implemented. . This indicates that, local auditors classified within a range of 25 to 50 kilometer from the customer less constrain management from engaging into earnings management. While the results are not significant, the results remain robust after measuring auditor-client distance (DMS100) as a dichotomous variable indicating whether the auditor office is located more than 25, 35, 50, 100 kilometers from the client's headquarters, as well as after measuring the distance based on continuous variable.

Second, by means of an analysis of variance is examined whether there is on average a difference between the regions of Australia. According to Australian bureau of statistics (ABS 2009), Australia is divided into five most important economic areas, known as Western Australia, New South Wales, Victoria, Queensland and Periphery (rest of the states SA, ACT, TAS, NT). From our sample, we found WA is the most concentrated area with the most economic activity. Due to the different economic activity in the regions of Australia, this sensitivity test endeavors to analyze whether the results are affected.

**Table 7.1: Presents the regression results for association between auditor locality and the level of discretionary accruals using different proxies for defining the local auditor**

Variables	Expected Sign	Model with Absolute DA, DLOCAL 15 km		Model with Absolute DA, DLOCAL 25 km		Model with Absolute DA, DLOCAL 35 km		Model with Absolute DA, DLOCAL 50 km		Model with Absolute DA, DLOCAL Continuous km	
		Coeff	t-statistic	Coeff	t-statistic	Coeff	t-statistic	Coeff	t-statistic	Coeff	t-statistic
DLOCAL	-	-0.005	[-0.17]	0.012	[0.31]	0.025	[0.48]	0.014	[0.25]	-0.000	[-0.75]
Inta	-	-0.029	[-1.22]	-0.029	[-1.23]	-0.029	[-1.23]	-0.029	[-1.23]	-0.029	[-1.21]
big4	-	-0.005	[-0.13]	-0.004	[-0.12]	-0.003	[-0.09]	-0.004	[-0.10]	-0.006	[-0.15]
tenure	-	-0.023	[-0.92]	-0.023	[-0.93]	-0.023	[-0.93]	-0.023	[-0.92]	-0.023	[-0.94]
nas	?	0.013	[0.34]	0.012	[0.33]	0.012	[0.34]	0.012	[0.34]	0.013	[0.36]
indspec	-	0.019	[0.60]	0.020	[0.63]	0.019	[0.61]	0.019	[0.60]	0.021	[0.66]
chgsale	+	-0.058	[-0.71]	-0.058	[-0.71]	-0.058	[-0.71]	-0.058	[-0.71]	-0.058	[-0.71]
loss	+	-0.389	[-5.88] ***	-0.388	[-5.87] ***	-0.389	[-5.92] ***	-0.389	[-5.91] ***	-0.389	[-5.89] ***
lev	+	0.049	[0.99]	0.049	[0.99]	0.049	[0.99]	0.049	[0.99]	0.049	[0.99]
zmij	+	-0.009	[-0.99]	-0.009	[-0.99]	-0.009	[-0.99]	-0.009	[-0.99]	-0.009	[-0.99]
cfo	-	-0.589	[-3.20] ***	-0.589	[-3.20] ***	-0.589	[-3.19] ***	-0.589	[-3.20] ***	-0.589	[-3.20] ***
lagaccr	-	-0.595	[-4.10] ***	-0.595	[-4.09] ***	-0.595	[-4.09] ***	-0.595	[-4.09] ***	-0.595	[-4.10] ***
concent	-	0.535	[1.37]	0.531	[1.38]	0.525	[1.38]	0.529	[1.38]	0.547	[1.39]
Industry & Year	?	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	?	0.544	[2.58] **	0.542	[2.59] ***	0.543	[2.60] ***	0.542	[2.60] ***	0.541	[2.59] ***
Observations		2,076		2,076		2,076		2,076		2,076	
R-squared		0.65		0.65		0.65		0.65		0.65	
Adj. R-squared		0.65		0.65		0.65		0.65		0.65	

**Where:**

DAjt= Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQjt = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100jt = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the sameState, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBSGjt = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBSG is 0; i.e.,  $\log(2 - 1) = 0$  (where for firm j, and for year t). LNTAjt = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4jt = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENUREjt = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NASjt = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPECjt = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALEjt = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSSjt = 1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEVjt = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJjt = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFOjt = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEVjt = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCRjt = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENTjt = A measure of auditor concentration by each state, (where for firm j, and for year t).

The sample used in this study reflects the difference in economic activity between the five areas. Table 7.2 reports that, most client firms are vested in Western Australia. In total 228 firms are located in the WA, 129 firms in the New South Wales area, 95 firms in Victoria, 49 firms in Queensland and rest 20 firms for the Periphery area. It could be argued that, although there is a significant difference in economic activity and the concentration of markets observed in WA. Nevertheless, clients located in the Western Australia are more likely to appoint a local auditor in contrast to clients firms located in the periphery. For example in table 7.2, 97 percent of the firms located in WA are audited through an auditor located in the same State's metropolitan area. An ANOVA test confirms a difference between regions with respect to the choice of an auditor ( $F=17.38$ ). A Post-Hoc Multiple Comparison of Western Australia, New South Wales, Victoria, Queensland and the periphery shows a significant difference among the State's auditor locality. In the Western Australia (WA) 97 percent of the clients' firms had a local auditor located in the same State's metropolitan area, in comparison with South Australia where 50 percent auditor located in the same State's metropolitan area. The other differences are not significant.

**Table 7.2 presents the number of client, Average distance, number of local client and percentage of local client :**

State	No of Client	Average Distance (Kms)	No of Local Client	Percentage of local Client
ACT	1	7.04	1	100%
NSW	129	127.66	121	94%
NT	1	1292.23	0	0%
QLD	49	123.97	46	94%
SA	15	145.96	14	93%
TAS	2	8690.20	1	50%
VIC	95	115.44	88	93%
WA	228	136.86	220	97%

Third, as multi-collinearity detected (the correlation between ZMIJ and LEV is above the critical limit of multi-collinearity (.9999)) high between some variables in Pearsons

correlations. Therefore, this study runs regressions including and excluding these variables. Nevertheless, the un-tabled result remains insignificant as the main regression explained in table 6.1 and 6.2.

Fourth, following Choi et al. (2012), this study also used Performance adjusted model (2005) accrual approach as an alternative measure of discretionary accrual. This method has been used by a number of scholars both in US (Tucker and Zarowin 2006; Krishnan, Su, and Zhang 2011) and Australia (Hamilton et al. 2005; Coulton, Ruddock, and Taylor 2007). Kothari et al. (2005) find their matched-firm approach (that is, performance matching based on current year's return on assets and using the Jones model) performs better than the performance adjusted approach. The results (untabled) of the multivariate tests, report the regression results for the model with absolute value of discretionary accruals as dependent variable. The F-statistic of the model is significant ( $F=125.43$ ;  $p = 0.000$ ) at 1% level and 53 percent of the variation in the dependent variable is explained by the model since the goodness-of-fit (adjusted R squared) is 0.52. The regression models of the subsamples are also significant, respectively ( $F= 28605.94$ ;  $p= 0.000$  and  $F= 65976.22$ ;  $p= 0.000$ ). About 99 percent of the variation in discretionary accruals is explained with the positive and negative discretionary accruals. The coefficient of interest DMS100 has the expected negative sign for absolute discretionary accrual model and positive discretionary accruals model. However, consistent with the main results, none of the models were found significant. The results for the untabled models are- absolute discretionary accrual model ( $\beta = -0.134$ ,  $p=0.210$ ), positive discretionary accruals model ( $\beta = -0.003$ ,  $p=0.665$ ) and negative discretionary accruals model ( $\beta = 0.016$ ,  $p=0.108$ ). This indicates that the level of discretionary accruals is not significantly affected by the geographic proximity of the auditor.

In addition, the alternative measure for the auditor-client proximity shows that on average the distance in Western Australia, New South Wales, Victoria, Queensland and the periphery are 137km, 128 km, 115 km, 124 and respectively. The results indicate a potential self-selection bias. However, little is known about the factors that determine a client firm's choice to appoint a local or non-local auditor. To address the potential self-selection bias associated with local auditors versus non-local auditor choice, subsamples are created for the WA, the NSW and VIC. A mean regression and a linear regression are run for these subsamples including the three suggested model used in main regression (absolute discretionary model, positive discretionary model and negative discretionary model). The results of the subsample analysis that address the association between the variable DMS100 and the audit quality are presented in the table 7.3. The results show approximately the same results as reported Table 6.1 except Victoria, where model with absolute discretionary accrual found significant in 5 percent level. The primary results continue to hold after controlling for the different geographic boundaries. However, further research is required to determine other factors that affect a client firm's decision to appoint a local rather than a non-local auditor and rule out the potential self-selection bias.

**Table 7.3: Presents the regression results for the State New South wales, Western Australia and Victoria**

Variables	Expected Sign	NSW			WA			VIC		
		Model with absolute value of discretionary accruals	Model of Positive discretionary accruals	Model of Negative discretionary accruals	Model with absolute value of discretionary accruals	Model of Positive discretionary accruals	Model of Negative discretionary accruals	Model with absolute value of discretionary accruals	Model of Positive discretionary accruals	Model of Negative discretionary accruals
<b>DLOCAL</b>		-1.848 [-1.06]	1.856*** [4.69]	1.796 [0.99]	0.082 [0.96]	0.000 [0.95]	0.000 [0.18]	0.152** [2.25]	0.004 [1.33]	0.000 [0.02]
<b>Inta</b>	-	-1.334** [-2.29]	0.094*** [4.52]	1.309* [1.91]	-0.092*** [-5.29]	0.000 [1.54]	0.000** [2.45]	-0.006 [-0.90]	0.000 [1.05]	0.003*** [3.05]
<b>big4</b>	-	2.073 [1.01]	-0.122 [-1.21]	-1.166 [-0.53]	0.026 [0.84]	-0.000 [-1.25]	0.000 [0.35]	-0.087 [-1.54]	-0.003 [-1.04]	-0.004 [-1.24]
<b>tenure</b>	-	-0.081 [-0.07]	-0.062 [-1.08]	0.164 [0.13]	-0.003 [-0.11]	-0.000 [-0.41]	0.000 [1.17]	0.025 [0.66]	-0.001 [-0.69]	0.000 [0.19]
<b>nas</b>	?	-0.319 [-0.24]	-0.079 [-1.45]	0.550 [0.30]	0.130*** [2.68]	-0.000 [-0.54]	-0.000 [-0.58]	-0.041 [-1.09]	0.002 [0.93]	-0.007 [-1.53]
<b>indspec</b>	-	0.353 [0.31]	-0.018 [-0.32]	0.121 [0.08]	0.068* [1.83]	-0.000** [-1.99]	-0.000 [-0.35]	0.033 [0.88]	0.000 [0.02]	0.005 [1.42]
<b>chgsale</b>	+	-1.347*** [-7.86]	0.887*** [27.03]	1.320*** [7.09]	0.006 [0.61]	-0.008*** [-306.50]	-0.008*** [-78.40]	0.188** [2.14]	-0.111*** [-41.40]	-0.103*** [-19.68]
<b>loss</b>	+	-4.497*** [-3.11]	0.349** [2.59]	4.058** [2.60]	-0.225*** [-4.88]	-0.000 [-0.19]	0.000 [0.59]	-0.156** [-2.60]	-0.005** [-2.49]	0.005 [1.22]
<b>lev</b>	+	17.169*** [2.98]	-0.057 [-0.11]	-18.532*** [-2.97]	0.055 [1.29]	-0.001 [-1.00]	-0.000 [-0.50]	0.146* [1.76]	0.000 [0.05]	-0.003 [-0.53]
<b>zmij</b>	+	-0.330* [-1.77]	0.028 [0.35]	0.326* [1.73]	-0.011 [-1.50]	0.000 [0.98]	-0.000 [-0.69]	-0.017 [-1.49]	-0.000 [-0.33]	0.001 [0.68]
<b>cfo</b>	-	-10.418*** [-3.28]	0.763*** [3.64]	10.015*** [2.95]	-0.189*** [-5.98]	0.000 [0.55]	-0.000*** [-2.92]	-0.210** [-2.23]	-0.008*** [-4.01]	-0.002 [-0.51]
<b>lagaccr</b>	-	0.093 [0.06]	2.416*** [20.61]	-0.268 [-0.19]	-0.433*** [-4.38]	1.002*** [499.98]	1.000*** [6,650.16]	-0.588*** [-3.61]	0.990*** [201.41]	1.008*** [154.29]
<b>concent</b>	-	-9.560 [-0.17]	6.106 [1.47]	-35.902 [-0.48]	-2.291** [-2.12]	0.013 [1.28]	0.001 [0.23]	1.973 [0.88]	0.140 [1.43]	0.304 [1.59]
<b>Constant</b>	?	14.647** [2.08]	-0.878** [-2.15]	-13.731* [-1.70]	1.084*** [6.32]	0.026*** [38.76]	0.025*** [64.85]	0.146 [0.96]	0.057*** [6.96]	0.032** [2.59]
<b>Industry &amp;Year</b>	?	Included	Included	Included	Included	Included	Included	Included	Included	Included
<b>Observations</b>		515	92	423	910	335	574	379	233	145
<b>R-squared</b>		0.86	0.98	0.86	0.50	1.00	1.00	0.71	1.00	1.00
<b>Adj R-squared</b>		0.85	0.97	0.86	0.48	1.00	1.00	0.69	1.00	1.00

t-statistics in brackets denote significance level at the \*\*\* 1%, \*\*5%, \* 10% of p-value

**Where:**

DA<sub>jt</sub> = Absolute value of discretionary (abnormal) accruals, (where for firm j, and for year t). AQ<sub>jt</sub> = Accrual quality, where this study will mostly use accrual quality measured by Dechow and Dichev's (2002) method, (where for firm j, and for year t). DMS100<sub>jt</sub> = Indicator variable for auditor location. This study will use two proxies, DMSA and D100, where DMSA is 1 if the audit office and client firm's headquarters are located in the same State, and 0 otherwise; D100 is 1 if the distance between the audit office and the client firm's headquarters is less than 100 kilometers, or if the audit office and the client firm's headquarters are located in the same state, and 0 otherwise, (where for firm j, and for year t). LNBSG<sub>jt</sub> = Natural log of the sum of the number of business and geographic segments minus 1. If business or geographic segment data are missing for a given observation from the database, this study will assign a value of 1. Thus, the minimum value of LNBSG is 0; i.e.,  $\log(2 - 1) = 0$  (where for firm j, and for year t). LNTA<sub>jt</sub> = Natural log of total assets in thousands of dollars, (where for firm j, and for year t). BIG4<sub>jt</sub> = 1 if the auditor is one of the Big 4 firms, and 0 otherwise, (where for firm j, and for year t). TENURE<sub>jt</sub> = Auditor tenure, measured as the natural log of the number of years the incumbent auditor has served the client firm, (where for firm j, and for year t). NAS<sub>jt</sub> = Relative importance of non-audit services, measured as the ratio of the natural log of non-audit fees over the natural log of total fees, (where for firm j, and for year t). INDSPEC<sub>jt</sub> = An indicator variable for auditor industry expertise that equals 1 if the audit firm is the industry leader for the audit year in the audit market of the MSA where the auditor is located, and 0 otherwise. This study will calculate each audit firm's industry market share of audit fees for an state as the proportion of audit fees earned by each firm in the total audit fees earned by all audit firms in the state that serve the same industry, (where for firm j, and for year t). CHGSALE<sub>jt</sub> = Change in sales deflated by lagged total assets, (where for firm j, and for year t). LOSS<sub>jt</sub> = 1 if the firm reports a loss for the year, and 0 otherwise, (where for firm j, and for year t). LEV<sub>jt</sub> = Leverage, measured as total liabilities divided by total assets, (where for firm j, and for year t). ZMIJ<sub>jt</sub> = Zmijewski's (1984) financial distress score, winsorized at 5 and -5, (where for firm j, and for year t). CFO<sub>jt</sub> = Operating cash flows, taken from the cash flow statement, deflated by lagged total assets, (where for firm j, and for year t). LEV<sub>jt</sub> = Total liabilities divided by total assets, (where for firm j, and for year t). LAGACCR<sub>jt</sub> = One year lagged total accrual. Accruals are defined as income before extraordinary items minus operating cash flows from the statement of cash flow deflated by lagged total asset, (where for firm j, and for year t). CONCENT<sub>jt</sub> = A measure of auditor concentration by each state, (where for firm j, and for year t).

### 7.3 Summary of the chapter:

This Chapter discussed the robustness and sensitivity test of the main results which discussed in Chapter Six. In particular, alternative measures of test variable auditor locality were examined. Subsequently, the sample was partitioned by geographical area based on concentrated economic activity and the main tests in Chapter Six were performed again.

Chapter Eight will stress on the contribution and implications of the results and an overall conclusion to this study. The hypothesis of this study will be highlighted. Subsequently, the contributions, and limitations and future opportunity of this study will also be outlined.



# Chapter Eight

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## Discussion and Conclusion of the study

### 8.1 Overview of the Chapter

Chapter Seven outlined the main result from the robustness and sensitivity tests performed for the study. Initially, the results of regressions using alternative measures for both test variables were reported and discussed. In addition, results of regressions which discussed on Chapter Six were also shown partitioning of the sample by major State areas engaged in concentrated economic activity.

The major conclusions and implications of this study will be discussed in Chapter Eight. Based on empirical results, justification for the acceptance or rejection of the hypothesis is summarized. Contributions of the study with limitations and future research window for the similar study are also discussed.

### 8.2 Study Overview

The role of geographic proximity between economic agents has been investigated across a wide range of areas, for example in inter-firm relations, investor's portfolio management, equity analysis and debt contracting (Agarwal and Hauswald 2010; Bae et al. 2008; Coval and Moskowitz 1999; Ganesan et al. 2006; Hollander and Verriest 2012; Ivkovich and Weisbenner 2005; Malloy 2005). These studies indicate that geographic proximity does matter for investors, analysts and borrowers. However, Choi et al. (2012) is the first study who investigates the effect in the context of the auditor-client relationship. Based upon the implications from prior studies, geographic proximity

results in advantages including information gathering, increased monitoring capabilities and lower transaction costs (Agarwal and Hauswald 2010; Kang and Kim 2008; Petersen and Rajan 2002). Auditors whose practicing office is located in the same Metropolitan Statistical Area (MSA) as where the client's headquarters is vested are defined as local auditors and they might benefit from geographic proximity. In addition, local auditors will be able to obtain more client-specific knowledge while they have the opportunity to visit the client's operations more frequently and obtain client-specific news from local media. Therefore, it could be argued that local auditors better constrain managements' abilities for opportunistic earnings management. On the other hand, geographic proximity could result in relatively closer personal ties between local auditors and their clients, which is detrimental to the auditors' objectivity and hence their independence (Bamber and Iyer 2007; Myers et al. 2003). As in many other studies, discretionary accruals are used as the outcome of opportunistic earnings management and serves as a proxy for audit quality (Choi et al. 2012; Chung and Kallapur 2003; Myers et al. 2003; Reynolds and Francis 2001). The expectation is that when the auditors benefit from the advantages of being geographic proximate, clients of local auditors have lower levels of absolute discretionary accruals, indicating a higher audit quality in comparison with clients of non-local auditors. However, higher levels of absolute discretionary accruals are expected if geographic proximity results in an impairment of audit independence (Choi et al. 2012). The univariate results from the observed current study indicate that, the mean discretionary accruals for firms with a local auditor are lower than for those with an auditor who is not located in the same State area. Although, this might indicate that local auditors perform a higher audit quality. Thus, there is a significant difference between the local auditor and an auditor located in another State area as the client. This

finding suggests that, due to the smaller distances in Australia, the Australian audit market can be seen as one area in which there is a distinction between local auditors and non-local auditors. Furthermore, the regression results show a negative association between the absolute value of discretionary accruals and the variable of interest (DMS100). Whereas, this might suggest that local auditors better constrain management from engaging in earnings management than non-local auditors. Even so after dividing the sample into positive and negative discretionary accruals, the variable of interest does not have a significant effect. The results remain robust after controlling for difference in economic activities and for using another proxy for distinguishing a local auditor. Since, geographic proximity is a relatively new engagement-specific factor for audit quality, this study further examines whether the relationship is valid in a market where the distances are much smaller than in the US. Therefore, this study investigates the effect of the auditor-client distance on audit quality.

### **8.3 Major Conclusion of the study**

Based on a sample of 2080 firm-year observations from Australian listed companies, this study examines if local auditors provide a higher audit quality in comparison to non-local auditors. An auditor is defined as a local auditor if the engagement office is vested in the same State's metropolitan area as the client's headquarter. As in many other studies, accrual-based earnings quality is used as proxy for audit quality (Chung and Kallapur 2003; Myers et al. 2003; Reynolds and Francis 2001; Fargher et al. 2008; Sun and Rath 2009, Kallapur et al. 2010). The results show no significant difference between the absolute value of discretionary accruals between local auditors and non-local auditors

when the test variable for geographic proximity measured at DMS100 (100 kilometers cut-off) and CONTINUOSKMS (no cut-off). Although local auditors may experience advantages due to geographic proximity or become closer with their clients, the results show that geographic proximity does not affect the audit quality. In other words, despite of the possible advantages of geographic proximity local auditors do not better deter management from engaging in opportunistic earnings management behavior. Neither does geographic proximity result in closer relationship with the client that affects auditors' independence. These results are in contrast to the study of Choi et al. (2012) who reported that local auditors do better constrain management's incentives to engage into earnings management. The outcome indicates that, the effect of geographic proximity on audit quality is not generalizable to all markets. Hence, the results found by Choi et al. (2012) are not valid in Australia where the distances are much smaller than the US between the economic agents. This indicates that the Australian audit market can be seen as one, while there is no distinction in audit quality for local auditor and non-local auditors.

#### **8.4 Contribution of the study**

This study contributes to the existing literature in several ways. Although prior studies in various research fields have investigated the effect of geographic proximity between economic agents, the study of Choi et al. (2012) is the first study who explored this association for audit quality in US. Current study contributes to the Australia audit literature since it provides additional insight in the effect of a relatively new engagement specific factor, namely geographic proximity on audit quality in Australian context. This

study further observes whether the relationship found in Choi et al. (2012) for the US environment is valid in Australia.

Furthermore, this study attempts to increase the understanding of earning management practices in Australian publicly listed firms by showing the prevalence of such practices to be around 18% of total assets which is considered relatively significant (Sun 2009; Hall et al 2013) . This contributes to the existing literature while prior research is often based on public firms in the US environment.

In the study of Ramseyer and Rasmusen (2010) concludes that, Australia perform with relatively low litigation rates whereas the US has a high litigation threat. This threat of litigation deters auditors to inappropriate audit reporting. When the likelihood to be sued is low, the auditor may feel tempted to keep a close relationship with the client, in order to ensure future fees (Gaeremyck and Willekens 2003). Hence, the results are of interest for regulators and supervisory authorities, as they are concerned about audit quality. However, this study shows that in Australia the geographic proximity does not affect audit quality probably because of the different audit regulation and audit market characteristics in comparison to the US. Therefore, regulatory authority in Australia might not need to be concern at this stage about the audit quality in terms of auditor locality.

In sum, findings of this research may be of particular interest for researchers examining cross-border geographic proximity effect on audit quality. Scholars will also benefit as this study will provide a contemporaneous update on audit quality in Australia and suggest direction for future research.

## 8.5 Limitations of the study

This study deals with several limitations. First, in order to measure the audit quality for local auditors the modified Jones is used as proxy. The model measures the level of discretionary accruals, which can be seen as an outcome of opportunistic earnings management (Chung and Kallapur 2003; Frankel et al. 2002). As earlier mentioned, the concept audit quality is difficult to measure and the proxy used has some limitations and obtain some critique. For example, an endogeneity problem can arise while the residual measures other things than audit quality such as volatility or growth (Bharath et al. 2008). However, other studies show that the results are not influenced by using an alternative proxy for audit quality (Choi et al. 2012; Vandenbergaeerde et al. 2012).

Second, the variable of interest has some limitations. For example, this study uses an assumption to measure auditor-client distance. It is assumed that the location of signing the annual report is the location from which the audit is conducted. However, the members of the engagement team might live in another city than where the engagement office is located. Therefore, individual team members of the engagement team may benefit from advantages arising from geographic proximity, such as obtaining client-specific knowledge from local newspapers. This measurement error is partly mitigated by using another proxy for auditor-client distance. Another problem that arises with regard to the variable of interest DMS100 is the problem that firms make a choice between local versus a non-local auditor. Therefore, the regression proxy to assess earnings management and a dummy for local auditor may suffer from sample selection bias (Heckman 1978). However, little is known about the factors that determine the choice to appoint a local or nonlocal auditor and the auditor locality. In

order to mitigate the concern that clients headquartered in a specific area are more or less likely to appoint a local auditor, this study splits the sample into subsamples (WA, NSW and VIC) based on economic activity. Besides, the study of Choi et al. (2012) shows robust results applying the Heckman (1979) approach with regard to the potential self-selection bias.

Third, due to data limitations a number of control variables (Issue, Book-to-market ratio, Cash flow volatility, Sales volatility and Operation cycle) are not included in the regression model. Prior literature shows that those control variables are known to affect the magnitude of earnings management (Chung and Kallapur 2003, Myers et al. 2003, Reichelt and Wang 2010). In addition, it might be argued that for example, the control variable Issue which controls financing transaction on earning management (Teoh et al. 1998) might have had a greater impact on auditor-client distance. However, current study tries to mitigate the omitted variables concern by means of including a comprehensive set of other control variables (e.g., Firm leverage, Big4, Change sales, Loss, Operating cash flow, Tenure, Auditors' Industry specialization and Auditor concentrations).

## **8.6 Future research**

Further research is required for a better understanding of the role of geographic proximity in shaping the auditor-client relationship in other jurisdictions and examine whether a cross-country differences exist. It would also be interesting to investigate what drives the firm's decision to appoint a local or a non-local auditor. An additional avenue for further research is to investigate the effect of auditor specialization on the

decision to appoint an (local) auditor and examine if specialization results in the same way as the auditor-client distance relationship observed in the current study. Finally, the future researcher could also investigate the influence of co-CBD micro-proximity versus Suburban near proximity on auditor client relationship.



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