THE PRICING OF AUDIT SERVICES AND THE EFFECTS OF AUDIT MARKET SIZE

By

Muhammad Ayat

Submitted to the graduate school of Engineering and Natural Sciences

in partial fulfilment of the requirements for the degree of

Master of Science

Sabanci University

January, 2015

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Approved by:

Assoc. Prof. Dr. J. B. G. Frenk (Thesis Advisor)……

Assoc. Prof. Dr. J. Goodwin (Thesis Advisor) ……

Assist. Prof. Dr. T. Altekin ……

Prof. Dr. J. L. Geluk ……

Assist. Prof. Dr. M. Kaya ……

Date of approval…09-01-2015

to my family and teachers…..

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Muhammad Ayat

Industrial Engineering, MSc. Thesis, 2015

Thesis Jury

Assoc. Prof. Dr. J.B.G. Frenk (Thesis advisor), Assoc. Prof. Dr. J. Goodwin (Thesis advisor), Assist. Prof. Dr.T. Altekin, Assoc. Prof. Dr.J.L. Geluk, Assist. Prof. Dr.M. Kaya,

Keywords: Audit fees, Market size, Ordinary Least Square model, fixed effect model.

Abstract

The purpose of this study is to examine the relation between audit fees and market size (proxied by the sum of client sizes domiciled in a city) using the data of Australian Stock exchange (ASX) listed companies. An Ordinary Least Squares (OLS) regression model and a client fixed effect model are applied to empirically test the relation between audit fees and market size. The client fixed effect model is used to control for omitted variable bias. Within this framework I apply two different audit fees measures as dependent variables and two groups of independent variables having different market size measures. This gives rise to eight different models. It is found that the relation between market size and audit fees is positively correlated and economically important. For example a one standard deviation increase in the market size of total assets leads to an increase in audit fees of about 6.47 percent. All of the found results are in line with previous published research by Hay, 2005; Sewon, O, and Kun Wang; Francis *et al*. 2005; Ferguson *et al*. 2003.

DENETİM SERVİSLERİNİN ÜCRETLENDİRİLMESİ VE DENETİM PAZAR HACMİNİN ETKİLERİ

Muhammad Ayat

Endüstri Mühendisliği, Yüksek Lisans Tezi, 2015

Tez Danışmanı: Doç. Dr. J.B.G. Frenk
Doç. Dr. J. Goodwin

Anahtar Kelimeler: Denetim ücreti, Pazar hacmi, En küçük kareler modeli, Sabit etki modeli

Özet

Bu çalışmanın amacı denetim ücreti ile pazar hacminin arasındaki ilişkiyi (şehirde ikametgâhı bulunan tüm müşterilerinvekâleti alınarak) Avustralya borsasında yer alan şirketlerin verilerini kullanarak incelemektir. En küçük kareler regresyon ve kullanıcı sabit modelleri denetim ücreti ve pazar büyüklüğü arasındaki ilişkiye deneysel olarak uygulanmıştır. Kullanıcı sabit etki modeli, değişken sapmalarının tarafsız bir şekilde kontrol altında tutulması için kullanılır. Bu çerçevede, bağımlı değişkenler ve farklı pazar büyüklüğüne sahip bağımlı değişenlerin iki grubu şeklinde iki farklı denetim ücretlendirmesi uygulandı. Bu durumda,sekiz farklı modelin oluşturulmasına sebep oldu. Pazar hacmi ile denetim ücreti arasındaki ilişkinin pozitif korelasyonlu ve ekonomik açıdan önemli olduğu çalışmalardan saptanmıştır. Örneğin, toplam mevcudun pazar hacminin standart sapması arttığında denetim ücretlerinde yüzde 6.47 oranında artışa neden olmaktadır. Elde edilen bütün sonuçlar Hay, 2005; Sewon, O, ve Kun Wang; Francis ve arkadaşları 2005; Ferguson ve arkadaşları 2003 tarafından yayınlanan araştırmalar ile bağdaşmaktadır.

Acknowledgment

I owe my deepest gratitude to my advisor Associate Prof. Dr. J. Goodwin, for his intellectual input, guidance, encouragements and inspiration throughout my thesis period that enabled me to excel both academically and technically. It has been always will be a great pleasure to work with him at all times.

I would like to thank my academic supervisor Associate Prof. Dr. J.B.G. Frenk for his all time advises, guidance and valuable inputs throughout my graduate study. His guidance and inspiration were being my driving forces during my graduate study.

I would also like to thank my family for their immeasurable love and support. I would like to dedicate this thesis to my family and teachers for being my driving forces not only for my academic journey but for all my life and for always trying to show me what is best and virtuous.

I am very grateful for the academic and moral support and guidance of my colleagues. I would like to thanks every single person for their contribution and help during my study. I would like to thank Dr. Nadeem Khawar, and Dr. Shaukat Ali for their support and love during my stay at Sabanci University, Istanbul.

TABLE OF CONTENTS

Page

List of Tables

Table Number Page

CHAPTER 1

INTRODUCTION

The seminal paper by Simunic [1980] introduced the "audit fee" model into the empirical accounting research literature. This model seeks to explain the factors that cause changes in audit fees charged by audit firms to their clients. Since that time, a number of common explanatory variables have been found to explain cross-sectional variation in audit fees, and these relations hold across different countries and industries. While client size, client complexity, client riskiness, and profitability have been typically identified as the most important classes of explanatory variables for audit fees, little is known about the relation between audit fees and audit market size (hereafter market size). Related audit literature suggests that this relation could be either positive or negative. In this study market sizes are measured as the sum of client assets/sales for all clients domiciled in that city.

The primary purpose of this study is to investigate empirically the relation between the market size and audit fees. To do this I used two different models: a linear regression model and a client fixed regression model. In the first model the natural logarithm of audit fees is taken as the dependent variable, while in the second the difference of the natural logarithm of audit fees for the financial years 2013 and 2014 acts as the dependent variable. The Ordinary least squares (OLS) regression model used in this study includes proxy variables for client attributes such as client size, client complexity, client riskiness and profitability, and auditors' attributes such as size of the

auditor and engagement attributes, that prior studies have found to be important explanatory variables for fees. This regression model is similar to the model used by some important studies in this area such as Francis *et al*. [2005] and Francis and Stokes [2003]. The fixed effect regression model used in this study includes differences of client attributes, auditors' attributes and engagement attributes over the financial years 2013 to 2014.

The OLS and fixed effect regression models are estimated using a dataset that is hand-collected from the Australian Stock Exchange (ASX) website. Specifically, the electronic copies of annual reports for the financial years 2013 and 2014 of ASX listed companies are downloaded and relevant data to estimate the models are obtained from those annual reports. For the OLS regression model, a sample size totalling 1,836 companies and for the client fixed effect regression model a sample size totalling 1,467 companies is used.

Both the OLS and client fixed effect regression results suggest that there is a positive association between the audit fees and market size. Two different measures of audit fees and market sizes are used to check the robustness of the results. These results are supported by positive Pearson correlation coefficients between market size and audit fees ranging from about 0.248 to about 0.349 (see Table 14).

The relations between market size and audit fees are not only statistically significant but also economically important. The economic importance becomes more prominent when market size is measured using total assets. For example a one standard deviation increase in the market size of total assets leads to an increase in audit fees of about 6.47 percent.

This study is organized as follows. Chapter 2 presents the literature review of the audit fees and its variability with client size, complexity and risk, auditor attributes and engagement attributes. In section 0, prior studies informing the relations between audit fees and market size are discussed and the research hypothesis to be tested in this study is presented.

Chapter 3 presents the audit fees model, specification of the audit fees model, the method of data collection and its sources. In Chapter 3, the descriptive statistics by industries and descriptive statistics of the variables used in the OLS regression model and fixed effect regression model are also shown and discussed in detail.

Chapter 4 presents the model section of this study. The results of the OLS regression model and the fixed effect regression model are discussed in detail in this chapter. Chapter 5 concludes the study, including a discussion of the main results and their implications for audit researchers, regulators, audit clients and auditors.

1.1 Motivation of the study:

I have assessed in this study the effect of market size on audit fees. Despite of the huge research based on the seminal work of the Simunic's audit fees model, no clear relation has been observed between market size and audit fees. The relation is important for audit researchers, audit regulators, auditors and audit clients. This study contributes improving the audit fee model. For example I found in the study that the market size is an important factor explaining the size of the audit fees. To reduce the possibility of omitted variable bias it seems important to include the market size as an explanatory variable in the model. This also has some practical implications for auditors, audit clients and regulators. For example, given that larger markets size have higher fees, costs saving may be easier to find than in smaller markets. There may also be more potential in term of costs for the auditors to adopt different competitive strategies in larger markets. It would therefore be wise for auditors to consider the effects of market size in designing competitive strategies. For example in smaller markets, the costs are relatively lower and so the competitive

strategy in these markets should be based on the efficiency and quality of services rather than on costs. The study has also importance for audit clients. For example, audit quality may change if a client moves from a smaller market to a larger market and vice versa. It is also important to note that cost changes if a client moves from a smaller market to a larger market and vice versa. There are also some other non-audit related factors such as access to suppliers which the clients should consider before moving to another market. Finally, for regulators, it would seem that drawing conclusions about implications of reduced audit fees for audit quality should also take into consideration the size of the market.

CHAPTER 2

LITERATURE REVIEW

Since the seminal work of Simunic (1980), an expanding stream of audit literature has examined the factors explaining the amount of audit fees paid by audit clients to their auditors. This is called the pricing of audit services. A large number of explanatory variables have been examined, of which the most important variables are those proxing for client size, client complexity, and client riskiness. The literature generally uses the audit fee model proposed by Simunic (1980). In this model the natural logarithm of audit fees is explained as a linear function of proxies for the various client attributes (Craswell and Francis, 1999).

In recent times, other important explanatory variables have also been found for audit fees. For example, in studies examining the effect of auditor size, the researcher is interested in answering the question of whether clients are willing to pay a higher fee to "Big4" audit firms than fees paid to "non-Big 4" audit firms. "Big4"audit firms are measured by a dummy variable in the regression model, where the variable "Big4" is set equal to one if the audit firm is PricewaterhouseCoopers, Deloitte Touché Tohmatsu, KPMG or Ernst and Young, and zero otherwise. Findings about the effect of this "Big4" variable on audit fees are mixed. Some studies have suggested evidence of a fee premium paid to "Big4" audit firms (Palmrose, 1996; Francis and Stokes, 1986; Chan *et al*., 1993), and others have failed to find the evidences of such a premium (Firth, 1985; Chung and Lindsay, 1988; Brinn et al., 1994). Some research studies have also suggested different fee

premiums for different Big4 audit firms (Taylor 1997; Simon and Taylor 2002) and fee premiums for industry specialist audit firms.

Auditor industry specialization is another important topic in the audit literature. Researchers have defined auditor specialists in different ways. Some researchers have defined auditor specialists as auditors with the largest market share in a given industry, and others have defined them as those with a market share in a given industry exceeding a certain cut-off level (Jiang *et al.* 2012). The importance of industry specialized auditors is attributable to the research findings that auditor industry expertise is associated with better auditor performance and higher audit quality. For better auditor performance, researchers argue that industry specialized auditors produce a more accurate and efficient audit. For instance, Solomon and Shields (1999) have performed an experiment, and showed that industry specialist auditors achieved more work and more accurate financial statements for their industries of specialization relative to other industries.

A group of researchers have investigated the effects of industry specializations on audit pricing. For example, Casterella *et al.* (2004) find that a fee premium exists for industry specialist auditors in the small client segment. Also audit fees decrease as a company becomes increasingly larger relative to the auditor's industry clients. This suggests that larger clients have stronger bargaining power resulting in lower fees. Huang *et al.* (2007) test whether the results of Casterella *et al.* (2004) still hold for the post-SOX period and they find that in the post-SOX period (i.e., 2003 and 2004) the negative association between audit fees and client size extends to both small and large client segments (Jiang *et al.* 2012).

Client profitability is considered another measure of risk. It reflects the extent to which the auditor may be exposed to loss in the event that a client is not financially viable (Simunic, 1980). In general, the worse the performance of the client, the more risk to the auditor and the higher the audit fee is expected to be.

Leverage also measures the risk of a client failing, which potentially exposes the auditor to loss (Simunic 1980). Consequently, researchers generally expect to find a positive association between the leverage of a company and its audit fees (e.g. Gist 1994b). The combined meta-results support the expected relationship between leverage and audit fees (Hay et al. 2006).

The most important determinant of audit fees is audit client size, which is expected to have a positive relationship with audit fees (Simunic 1980). Prior studies suggest the existence of a direct relationship between the amount of audit fees and the audit client size. (Simunic, 1980, 1984; Maher *et al*., 1992; Francis, 1984; Firth, 1985; Francis and Stokes, 1986; Palmrose, 1996; Simon and Francis, 1988; Taylor and Baker, 1981; Chung and Lindsay, 1988; Chan *et al*.1993; Craswell and Francis, 1999; DeFond *et al*., 2000). A positive effect of client size for audit fees is also expected, since the audit firm is expected to do more audit work as the client size increases (Atanasiu, Iosivan; 2008).

2.1 AUDIT FEES AND MARKET SIZE:

In the following sections I develop my hypothesis about the relation between the pricing of audit services and market size with reference to most of the relevant studies. As the relations between these aforementioned variables are unclear, I provide two separate sections, each covering a different directional prediction. First, I discuss why the relation between fees and market size could be negative and then I discuss why this relation could be positive.

Why would the relation between audit fees and market size be negative?

The arguments for a negative relation between audit fees and market size are related to the fixed cost recovery, competition and economies of scale.

Campbell and Hopenhayn (2005) noted that oligopolists' average sales must rise with increasing market sizes. The mark-up (difference in cost and price) falls with increased sales since they must recover the fixed cost with a lower mark-up by selling more. Campbell and Hopenhayn (2005) also note that in a large market, the competitors cannot use their product placement decisions to protect their mark-ups indefinitely which lead to reductions in price-cost mark-ups. They argued for a reduction of cost with increases in market size due to more production which leads to a reduction of fixed cost per unit (product or service) and shrinking in price-cost mark up while increasing market size due to increasing the competition in the market. Sirois and Simunic (2011) argue that market size has a negative association with the audit price due to investments in audit technology increasing with increases in market size which lowers audit production cost (effort cost). Melitz and Ottaviano (2006) showed that a bigger market exhibits larger and more productive firms as well as more product variety, lower prices, and lower mark-ups. So increases

in the market size reduce cost-price mark-ups. This suggests a negative association of the market size and prices. Similar results have been shown by the Campbell and Hopenhayn (2005). They suggested that large market size increases the competition among the industries, and decreases the mark-ups. In this study, authors have compared percentage changes of market size and competition with decrease in price-cost mark-up. Berger *et al.* (2001) studied the relationship of the loan price and market size for large banks and market size for small banks separately. They suggested that the loan price is negatively associated with the market size of both the large bank and market size of the small banks. Elberfeld (2001) showed that with increases in market size, the output of each downstream firm grows, so that each firm is better able to achieve scale economies in upstream production. As a result, buying the input in the market becomes less attractive which leads to reduction in the prices. Thus the presence of scale economies in larger markets and the willingness to pass them onto clients suggests that one might observe a negative relation between audit fees and market size. Evidence from the US suggests that auditors are willing to pass on the audit fees benefits of scale economies when those auditors have a large number of clients in a city (Fung *et al.* 2012). Findings and arguments from the above studies suggest a negative relation between market size and pricing of audit services.

Why would the relation in the audit fees and the market size be positive?

In contrast to the previous discussions, labour and other production costs and work quality-related reasons, provide justification for expecting that the relation between audit fees and market size could be positive.

In some countries, there are metropolitan centers whose costs are higher than the rest of the country. For example, Hay (2005) suggests that costs may be higher in London than in other cities in the United Kingdom, higher in Amsterdam than in other cities in the Netherlands and higher in Oslo than in other cities in Norway. Sewon and Kun Wang (2009) suggest that audit fees are

positively associated with the size of the city. They report that audit fees are significantly higher for larger cities than smaller cities, because the effects of low-balling are more persuasive in smaller cities, where the audit markets are more contestable due to competition.

Sirois and Simunic (2011), DeAngelo (1981), and Simunic (1984) suggest that the bigger the market size, the higher the audit quality and as a result the audit fees will also be higher. Numerous studies in the audit literature report a positive relation between audit fees, audit effort and auditor quality. Caramanis and Lennox (2008) for example, find that more hours worked by Greek auditors is associated with lower earnings management. This suggests that the higher effort exerted by auditors in larger markets could explain a positive coefficient for the market size measure in regression models explaining audit fees. This argument is consistent with Sundgren and Svanstrom (2011).

Given that there are competing predictions for the relation between audit fees and market size, my research hypothesis in null form can be stated as follows:

HYPOTHESIS: *There is no relation between market size and audit fees*

I test this hypothesize by estimating a linear and a fixed effect regression model. Both approaches are discussed in detail in the following chapter.

CHAPTER 3

RESEARCH METHODOLGY:

3.1 AUDIT FEES MODELS:

The research hypothesis is first empirically tested by estimation of an OLS regression model with the natural logarithm of audit fees (*FEE*) used as the dependent variable and subsequently by a client fixed effect regression model. The model is similar to the model used by Ferguson *et at.* (2003) with Australian data, and is based on the seminal model proposed by Simunic (1980) and adapted for recent studies as follows:

$$FEE_i = w_0 + w_1 ASSETS_{it} + w_2 CATA_{it} + w_3 FOREIGN_{it} + w_4 LEV_{it} + w_5 MSHARE_{(PAR)it} + w_6 MARKET\ SIZE_{it} + w_7 NSEG_{it} + w_8 QUICK_{it} + w_9 REPORTLAG_{it} + w_{10} ROA_{it} + w_{11} SALE_{it} + w_{12} LOSS_{it} + w_{13} NONJUNE_{it} + w_{14} OPINION_{it} + w_{15} BIG_{it} + w_{16} IND\_FE_{it} + v_{it}. \quad (1)$$

I use for client *"i"*, the explained variable $FEES_{it}$ to be either the natural logarithm of total audit fees or the natural logarithm of audit fees of the parent audit firm measured at time *t*. Additional to total audit fees, which are more commonly used in the audit literature, fees paid to the parent entity auditor have also been used in this study to assess the robustness of the results. The error terms v_{it} is the random variable for client *i* at time *t (t=2013,2014)* and these random variables are

assumed to be independent and normally distributed with zero mean and the same variance for every *i* and *t*.

The explanatory variable $MARKET\ SIZE_{it}$ denotes either the total assets or the total sale of the client at the city level. Both market size measures together with total audit fees and parent audit fees are then used separately giving rise to four different estimation results. This is done to test the robustness of the results.

The following client fixed effect (changes) model is estimated:

$$\Delta FEESit =$$

$$w_0 + w_1\Delta ASSETS_{it} + w_2\Delta CATA_{it} + w_3\Delta FOREIGN_{it} + w_4\Delta LEV_{it} + w_5\Delta MSHARE_{(PAR)it} +$$

$$w_6\Delta MARKET\ SIZE_{it} + w_7\Delta NSEG_{it} + w_8\Delta QUICK_{it} + w_9\Delta REPORTLAG_{it} + w_{10}\Delta ROA_{it} +$$

$$w_{11}\Delta SALE_{it} + w_{12}\Delta LOSS_{it} + w_{13}\Delta NONJUNE_{it} + w_{14}\Delta OPINION_{it} + w_{15}\Delta BIG_{it} +$$

$$w_{16}IND\_FE_{it} + v_{it} \quad (2)$$

The client fixed effect model is used to reduce the threat of omitted variable bias. It assists in controlling for unobserved heterogeneity that is constant over time and correlated with the independent variables. An example of such an omitted variable could be a client's corporate governance system. The effects of variables such as these are removed from the analysis through differencing. The variables used in the client fixed effect model are the differences over the financial years 2014 to 2013 $(t_i\text{-}t_{i-1})$.

Before introducing the definitions of the explanatory and explained variables, I explain a few terms here.

Total Assets**:** Anything that a business owns and has value and can be converted to cash. It is further categorised in current and non-current assets. For example, cash, building, machinery, supplies.

Current Assets: Anything that a business owns and has value and can be converted to cash in less than one year. For examples, cash, supplies, inventory.

Total liability**:** The aggregate of all debts an individual or company is liable for. It can be split into two basic categories as current liability and non-current liability. E.g. interest payable, wages payable, long term debt.

Current liability: Current liabilities are those liabilities which are due within one year or less, e.g. wages payable taxes.

Inventory: The raw materials, work-in-process goods and completely finished goods that are considered to be the portion of a business's assets that are ready or will be ready for sale.

Business segment: Business segments are based on the nature of the products or services the firms provide to the market.

Geographic segment: Geographic segments are based on the location of products or services.

3.2 VARIABLES DEFINITIONS:

The variables are defined as follows:

FEE_{TOTAL} = Natural logarithm of total audit fees (in whole Australian dollars) paid to all auditors of group entities and winsorized at the 1^{st} and 99^{th} percentile value.

FEE_{PARENT} = Natural logarithm of audit fees (in whole Australian dollars) paid to the auditor of the parent entity and winsorized at the first and 99^{th} percentile value.

ASSETS = Natural logarithm of the total assets of the firm and winsorized at its first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

CATA = Current assets divided by total assets and winsorized at its first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

FOREIGN = Number of *FOREIGN* subsidiaries divided by total subsidiaries. I expect a positive sign for the coefficient of this variable.

LEV = Total liabilities divided by total assets and winsorized at the first and 99th percentile. I expect a positive sign for the coefficient of this variable.

$MSHARE_{PAR}$ = Industry market share of the partner at city level. I expect a positive sign for the coefficient of this variable.

MARKET SIZE = Market size is calculated in two ways, by using total asset and by using total revenue and have winsorized these variables at their first and 99th percentile values.

i. The Natural logarithm of the sum of the total assets in a city.
ii. The Natural logarithm of the sum of the total sale revenue in a city.

I have no expectation for the sign of the coefficient of these variables.

NSEG = Natural logarithm of the sum of business and geographic segments. I expect a positive sign for the coefficient of this variable.

QUICK = (Current assets - inventory) divided by total assets and winsorized at its first and 99th percentile values. I expect a negative sign for the coefficient of this variable.

REPORTLAG = Natural logarithm of the number of days from the client's year end to the date of the audit report. I expect a positive sign for the coefficient of this variable.

ROA = Net income divided by total assets and winsorized at its first and 99^{th} percentile values. I expect a negative sign for the coefficient of this variable.

SALE = Natural logarithm of the client's total revenue and winsorized at its first and 99^{th} percentile values. I expect a positive sign for the coefficient of this variable.

LOSS = One if the client's net income is less than zero, and zero otherwise. I expect a positive sign for the coefficient of this variable.

OPINION = One if the auditor issues a going concern opinion, and zero otherwise. I expect a positive sign for the coefficient of this variable.

NONJUNE = One if the client's fiscal year end is not June 30, and zero otherwise. I expect a positive sign for the coefficient of this variable.

BIG4 = One if the audit firm is any of the big four audit firms: Ernst & Young, Pricewaterhousecoopers, Deloitte Touche Tohmatsu, or KPMG, and zero otherwise. I expect a positive sign for the coefficient of this variable.

IND_FE_{ij} = One if the auditee is classified in a given GICS industry group and zero otherwise. There are total of twenty four industries and consequently twenty three industry dummies in the estimated OLS regression.

Change variables have the following definitions.

ΔFEE_{TOTAL} = The difference of FEE_{TOTAL} for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values.

ΔFEE_{PARENT} = The difference of FEE_{PARENT} for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values.

$\Delta ASSETS$ = The difference of *ASSETS* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

$\Delta CATA$ = The difference of *CATA* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

$\Delta FOREIGN$ = The difference of *FOREIGN* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔLEV = The difference of *LEV* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

$\Delta MSHARE_{PAR}$ = The difference of $MSHARE_{PAR}$ for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

Δ*MARKET SIZE (ASSETS)* = The difference of *MARKET SIZE (ASSETS)* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile

values. I have no expectation for the size of the coefficient of this variable.

ΔMARKET SIZE (SALE) = The difference of *MARKET SIZE (SALE)* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I have no expectation for the size of the coefficient of this variable.

ΔNSEG = The difference of *NSEG* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔQUICK = The difference of *QUICK* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a negative sign for the coefficient of this variable.

ΔREPORTLAG = The difference of *REPORTLAG* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔROA = The difference of *ROA* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a negative sign for the coefficient of this variable.

ΔSALE = The difference of *SALE* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔLOSS = The difference of *LOSS* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔOPINION = The difference of *OPINION* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔNONJUNE = The difference of *NONJUNE* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

ΔBIG4 = The difference of *BIG4* for financial year 2014 and financial year 2013 and winsorized at the first and 99th percentile values. I expect a positive sign for the coefficient of this variable.

3.3 DESCRIPTION OF AUDIT FEES MODEL

The OLS regression model (given in section 0) has various continuous independent variables and dummy variables to control for the attributes of auditors, clients, and the audit engagement. Control variables are used to control for client-specific factors such as size, risk, and complexity, and auditor-specific factors such as industry specialization by the audit partner and the auditor's opinion on his client's financial statements. Consistent with recent literature, control variables for clients with non-standard fiscal year-ends and the length of the reporting lag are also used in the model.

More specifically, size of the client is measured as the natural logarithm of total assets (*ASSETS*), and the natural logarithm of sales *SALE,* industry market share of the partner at the city level ($MSHARE_{PAR}$), the natural logarithm of the number of business and geographic segments (*NSEG*), the ratio of foreign subsidiaries to total subsidiaries (*FOREIGN),* and the ratio of current assets to total assets *(CATA).* The auditee risk variables are the ratio of total liabilities to total assets *(LEV),* the return on assets *(ROA),* the ratio of the difference of current assets and inventory to total assets (*QUICK*), a dummy variable that takes a value of 1 if the auditee has made a loss *(LOSS),* and a dummy variable that takes a value of 1 if the auditor issues a going concern opinion (*OPINION).* The effects of a non-standard year-end are controlled for using the variable (*NONJUNE),* which takes a value of 1 if the auditee's year-end is not June 30, 2013. Each of these control variables has been examined in the meta- analysis of Hay *et al*. (2006) and has been found to be a significant determinant of audit fees. Audit quality is controlled by the use of the variable (*BIG4),* which takes the value of 1 if the client is audited by a big four audit firm. The natural logarithm of the number of days between 30th June 2013 and the audit report date *REPORTLAG* is used to proxy for audit delay. The auditee's industry is controlled for, by using dummy variables *(IND_FE_i)* as listed in

section 3.2, which take the value of 1 if the auditee is classified in one of the twenty four GICS industry group, e.g. if it is "Energy" then 1, otherwise 0. There are twenty three such dummy variables denoted by *(IND_FE$_i$)* in the model.

Logarithm transformation is used on the independent variables such as *ASSETS, MARKET SIZE, NSEG, REPORTLAG,* and *SALE* and the dependent variable (*FEE*), in order to improve the linearity of these variables. The dependent variable and all independent variables except for *REPORTLAG* and the dummy variables are winsorized at their 1st and 99th percentile values to reduce the influence of extreme values unduly influencing the results. *REPORTLAG* is not winsorized because it has no outliers.

In the audit fee model, fees are positively dependent on the amount of work the auditor has performed (*ASSETS, SALE*), the client's complexity (*NSEG, FOREIGN*), the client's inherent risk (*CATA, QUICK, LEV, ROA, LOSS, OPINION*), the auditor's reputation (*BIG4*), and the time taken to complete the audit (*REPORTLAG*), while fees are negative dependent if the client has a year end in an off-peak month (*NONJUNE*).

As noted above, two market size measures are used to assess the robustness of the results, namely *MARKET SIZE (ASSETS)* and *MARKET SIZE (SALE).* The correlation coefficient between these two measures is 0.924 as shown in Table 13, indicating that they capture much of the same information. The correlation is not perfect however.

With regard to the client fixed effect model (2), the difference of the size of the client for financial year 2013 and 2014 is calculated, as the change in total assets (*ΔASSETS*), the change of market size (*ΔMARKET SIZE*), which are the difference of the natural logarithm of total assets or total sales of firm at city level (*MARKET SIZE)*, the change of industry market share of partner at city level ($\Delta MSHARE_{PAR}$), and the difference of all other variables used in the OLS regression model for financial years 2013 to 2014 have been used in the client fixed effect model. Though change

variables are the differences of the values whose natural logarithm has been taken, the linearity assumption has already been satisfied. The dependent variables and all independent variables except *REPORTLAG* were winsorized at their 1st and 99th percentile values to reduce the influence of extreme values on the results. *REPORTLAG* is not winsorized because it has no outlier.

3.4 DATA COLLECTION

The data comprises of ASX listed companies for the financial years 2013 to 2104. All data are obtained from client's electronic copies of annual reports for the year 2013 and 2104, downloaded from the ASX website:

(http://www.asx.com.au/asx/statistics/announcements.do).

The initial sample *(N=2139)* comprises all listed companies of the ASX for the 2013 fiscal year. There were 303 companies eliminated from the dataset for the 2013 fiscal year reducing the sample size to 1836 companies. The reasons and other details about eliminated companies from the dataset are given in Table 1. The derivation of the sample for the financial year 2014 is shown in Table 2.

The dataset consists of financial information of the firms, remuneration fees for audit and non-audit services paid by the firms to the auditors, and number of segments and subsidiaries. Segments have been classified into two groups, business segments and geographic segments. Business segments are based on the nature of the products or services the firms provide to the market, and geographic segments are based on the location of products or services. The data set also has information about the number of subsidiaries of a company. It is classified based on their location as local or foreign subsidiaries. The data also has the information about the auditor, auditor partner, audit report date, and audit office location from where the audit is carried out.

The audit fees are categorized as parent auditor and other auditors. Parent auditors are the auditors of the parent entity in the consolidated group, while other auditors are the auditors of any other entity in the group, such as a foreign subsidiary.

Table 1: Sample Derivation- 2013

	N	
Listed Companies		2,139
Less:		
"Not applicable GICS codes"	164	
"Report not uploaded till June 2014"	52	
"Suspended Companies"	65	
"Incomplete information"	22	
Total	303	
Final Regression Sample		1836

The companies whom GICS code is not applicable include all those companies that are not assigned to a sub-industry according to the definition of GICS (Global Industry Classification Standard).
Report not uploaded till June 2014 includes all those companies that didn't uploaded their annual report for financial 2013 on website till June 2014.
Suspended companies includes all those companies which are delisted from the Australian Securities exchange (ASX) listed companies for financial year 2013.
Incomplete information uploaded companies are those who do not have sufficient information to measure all the required variables.

The financial information such as total assets of the company, current assets, inventory, total liabilities, current liabilities, net profit/losses and total revenues has been collected for each company.

Table 2 Sample Derivation- 2014

		N
Listed Companies		1,918
Less:		
"Not applicable GICS codes"	165	
"Report not uploaded till December 2014"	163	
"Suspended Companies"	71	
"Incomplete information"	27	
"Missing reports for year 2013"	27	
Total	453	
Final Sample	1465	

The companies whom GICS code is not applicable include all those companies that are not assigned to a sub-industry according to the definition of GICS (Global Industry Classification Standard).
Report not uploaded till December 2014 includes all those companies that didn't uploaded their annual report for financial 2014 on website till December 2014.
Suspended companies included all those companies which are delisted from Australian Securities exchange (ASX) listed companies for financial year 2014.
Incomplete information uploaded companies are those who do not have sufficient information to measure all the required variables.
Missing reports for 2013, include all those companies whose data were unavailable for financial year 2013. These are deleted from the dataset because I am not able to take the difference of financial year 2013 and 2014.

Table 3: Currencies used to report financial data

	Symbol	Number of companies
Australian Dollar	AUD	1732
US Dollar	USD	72
New Zealand Dollar	NZD	11
Singapore Dollar	SGD	6
Canadian Dollar	CAD	5
Euro	EUR	4
Hong Kong Dollar	HKD	3
Papua New Guinean kina	PGK	2
Chines Renminbi	CNY	1
Total		1836

The numbers of companies in the dataset who report in particular foreign currencies are given. For instance there are 1732 companies in the dataset who have shown their values in Australian dollars (AUD)

There are 103 firms in the sample (*N=1836*) whose audit reports are presented in foreign currencies i.e. currencies other than Australian dollars (AUD). The details about different currencies are given in Table 3. All foreign currencies are converted to Australian dollars (AUD) using the spot rate of foreign exchange at the companies financial year end, given on the website: http://www.bloomberg.com/markets/currencies/ .

The currency proportions are the same for the changes model sample as OLS regression model sample, so a separate table is not shown.

3.5 DESCRIPTIVE STATISTICS

Table 4 reports the descriptive statistics for the financial year 2013 of the variables used in the ordinary least square (OLS) model (1). As is common in studies using Australian data there is wide variation in client size. Consistent with previous research the distributions of audit fee variables are highly positively skewed. For example, the average audit fee is 458765 and the range is from 1000 to 18848000. To reduce the impact of outliers, the natural log of variables are used and some variables are winsorized (consistent with Ferguson *et al.* 2003). The mean of *LOSS* shows that about 64% of companies in the sample have reported a loss in financial year 2013, consistent with the negative median *ROA*. The variable *OPINION*, which is the indicator variable for the issuing of going concern shows that about 27% of the companies have been issued a going concern by the auditors. The sample consists of 20% of *BIG4* companies and 80% of *Non-BIG4* companies. *BIG4* companies comprise Ernst & Young, Pricewaterhousecoopers, Deloitte Touché Tohmatsu, and KPMG. The *NONJUNE* indicator variable shows that about 15.6% of the companies in sample did not end their fiscal year at 30th June of 2013.

Table 4: Descriptive statistics of the variables used in the regression model (1)

VARIABLES	MIN	MEDIAN	MEAN	MAX	STDDEV	P1	P99
FEE_{TOTAL}	1000	65950	458765	18848000	5102124	9525	4820080
$LOG\ \ FEE_{TOTAL}$	0.3979	4.819	4.941	6.709	0.537	3.980	6.706
FEE_{PARENT}	1000	61700	413584	18848000	5064923	8508	3463840
$LOG\ FEE_{PARENT}$	0.3955	4.790	4.903	6.661	0.516	3.960	6.641
ASSET	4.957	7.386	7.374	10.398	1.072	4.968	10.380
CATA	0	0.318	0.399	1.000	0.315	0	1.000
FOREIGN	0	0	0.296	1.000	0.366	0	1.000
LEV	0.003	0.245	0.457	7.409	0.962	0.003	7.370
MARKET SIZE (ASSET)	9.416	11.468	11.701	12.363	0.615	9.416	12.363
MARKET SIZE (SALE)	9.416	11.365	11.210	11.403	0.334	9.416	11.403
NSEG	0.301	0.477	0.507	1.041	0.209	0.301	1.041
$MSHARE_{PAR}$	0	0.022	0.114	1.000	0.234	0	1.000
QUICK	0	0.266	0.363	1.000	0.310	0	1.000
REPORTLAG	0.954	1.929	1.869	4.620	0.168	1.505	2.136
ROA	-17.080	-0.084	-0.568	1.051	2.072	-16.736	1.034
SALE	3.309	6.405	6.499	9.952	1.607	3.332	9.943
BIG4	0	0	0.200	1.000	0.400	0	1.000
LOSS	0	1.000	0.645	1.000	0.479	0	1.000
NONJUNE	0	0	0.156	1.000	0.363	0	1.000
OPINION	0	0	0.270	1.000	0.444	0	1.000

(The table is continued on the next page).

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Table 4 is continued

The variables have the following definitions.

FEE_{TOTAL}= Natural logarithm of total audit fees (in Australian dollars) paid to all auditors of group entities and winsorized at the first and 99th percentile values.

FEE_{PARENT} = Natural logarithm of audit fees (in Australian dollars) paid to the auditor of the parent entity and winsorized at the first and 99th percentile values.

ASSETS= Natural logarithm of the total assets of the firm and winsorized at its first and 99thpercentile values.

CATA= Current assets divided by total assets and winsorized at its first and 99th percentile values.

FOREIGN=Number of *FOREIGN* subsidiaries divided by total subsidiaries.

LEV= Total liabilities divided by total assets and winsorized at the first and 99th percentile values.

MARKET SIZE (CITY)=Market size is calculated by two ways, by using total asset and by using total revenue and have winsorized at their first and 99th percentile values.

I. The Natural logarithm of the sum of the total assets in a city.
II. The Natural logarithm of the sum of the total Sale Revenue in a city.

NSEG= Natural logarithm of the sum of business and geographic segments.

$MSHARE_{PAR}$= Industry market share of the partner at city level.

QUICK= (Current assets - inventory) divided by total assets and winsorized at its first and 99th percentile values.

REPORTLAG= Natural logarithm of the difference of year end and date of audit report

ROA= Net income divided by total assets and winsorized at its first and 99th percentile values.

SALE= Natural logarithm of total revenue and winsorized at its first and 99th percentile values.

BIG4= One if the audit firm is any of the big four audit firms Ernst & Young, Pricewaterhousecoopers, Deloitte Touche Tohmatsu, or KPMG, and zero otherwise

LOSS= One if the net income is less than zero, and zero otherwise.

NONJUNE= One if the client's fiscal year end is not June 30, and zero otherwise.

OPINION= One if the auditor issue a going concern opinion, and zero otherwise.

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Table 5: Descriptive statistics of the variables used in the regression model (2)

VARIABLES	MIN	MEDIAN	MEAN	MAX	STDDEV	P1	P99
ΔFEE_{TOTAL}	-2336000	500	3312	2457146	517688	-449676	533412
$\Delta LOG\ FEE_{TOTAL}$	-0.629	-0.004	0.002	0.843	0.177	-0.577	0.786
ΔFEE_{PAREN}	-2336000	658	4625	2457146	511496	-439070	533412
$\Delta LOG\ FEE_{PARENT}$	-0.629	-0.007	0.007	0.843	0.184	-0.620	0.837
$\Delta ASSET$	-0.629	0.002	-0.0006	0.843	0.267	-0.629	0.843
$\Delta CATA$	-0.629	0.0005	0.0009	0.843	0.222	-0.629	0.830
$\Delta FOREIGN$	-0.629	0	-0.047	0.843	0.210	-0.629	0.521
ΔLEV	-0.629	-0.002	0.018	0.843	0.248	-0.629	0.843
ΔMARKET SIZE (ASSET)	-0.629	-0.035	0.173	0.843	0.280	-0.629	0.843
ΔMARKET SIZE (SALE)	-0.629	0.025	-0.049	0.843	0.172	-0.629	0.473
$\Delta NSEG$	-0.602	0	-0.020	0.653	0.106	-0.397	0.301
$\Delta MSHARE_{PAR}$	-0.998	-0.001	0.006	0.996	0.134	-0.468	0.515
$\Delta QUICK$	-0.629	0.0008	0.001	0.843	0.224	-0.629	0.830
$\Delta REPORTLAG$	-2.654	0	-0.003	0.787	0.128	-0.350	0.268
ΔROA	-0.629	0.001	0.001	0.843	0.371	-0.629	0.843
$\Delta SALE$	-0.629	-0.011	-0.0002	0.843	0.424	-0.629	0.843
$\Delta BIG4$	-1	0	-0.057	1	0.380	-1	1
$\Delta LOSS$	-1	0	-0.120	1	0.481	-1	1
$\Delta NONJUNE$	-1	0	-0.029	1	0.181	-1	0
$\Delta OPINION$	-1	0	-0.028	1	0.416	-1	1

(The table is continued on the next page)

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Table 5 is continued

Change variables have the following definitions.

ΔFEE_{TOTAL}= The difference of FEE_{TOTAL} for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

ΔFEE_{PARENT} = The difference of FEE_{PARENT} for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values

$\Delta ASSETS$= The difference of *ASSETS* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta CATA$= The difference of *CATA* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta FOREIGN$= The difference of *FOREIGN* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

ΔLEV= The difference of *LEV* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

Δ*MARKET SIZE (ASSETS)* = The difference of *MARKET SIZE (ASSETS)* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

Δ*MARKET SIZE (SALE)* = The difference of *MARKET SIZE (SALE)* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta NSEG$= The difference of *NSEG* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta MSHARE_{PAR}$=The difference of $MSHARE_{PAR}$ for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta QUICK$= The difference of *QUICK* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta REPORTLAG$= The difference of *REPORTLAG* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

ΔROA= The difference of *ROA* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta SALE$= The difference of *SALE* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta BIG4$= The difference of *BIG4* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta LOSS$=The difference of *LOSS* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta NONJUNE$= The difference of *NONJUNE* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

$\Delta OPINION$= The difference of *OPINION* for financial year 2013 and financial year 2014 and winsorized at the first and 99th percentile values.

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Table 5 reports the descriptive statistics of the variables used for the client fixed effect model (2). The mean of *ΔLOSS* indicates that about 12% of companies were not in loss in financial year 2013 but were in loss in year 2014. The negative mean of *ΔROA* is consistent with the negative mean of *ROA* for financial year 2013. The mean of *ΔOPINION* indicates that about 2.8% of the companies who had not received a going concern opinion from their auditors have been received a going concern from their auditors in financial year 2014. The means of *ΔMARKET SIZE (ASSETS)* and *ΔMARKET SIZE (SALE)* indicate that market size (assets) have increased by about 17% while market size (sales) have decreased by about 4.9% as compared to the market sizes in financial year 2013. As shown in Table 5, both dependent variables *ΔLOG* FEE_{TOTAL} and *ΔLOG* FEE_{PARENT} have increased by about 0.2% and 0.7% respectively as compared to financial year 2013. The change of client size variables of *ΔSALE* and *ΔASSETS* and Assets have decreased with a smaller number of 0.02% and 0.06%, respectively. The change of the client inherent risk variables such as *ΔCATA, ΔLEV,* and *ΔQUICK* have increased by a small amount of 0.09%, 0.18%, and 0.01% respectively, where *ΔOPINION* and *ΔLOSS,* have decreased by 2.8% and 12%, respectively. The change in client complexity variables *ΔNSEG* and *ΔFOREIGN* shows decrease of 2% and 4.7%, respectively.

In Table 6, Industries descriptive are given showing the frequencies, medians and means of total assets by industries.

The industry with the highest frequency is the Material industry with 729 companies or about 40% of the total dataset. As shown in Table 6, the Bank industry has the highest mean of total assets which shows that the Bank industry is comparatively much larger than other industries. Although, there is only 13 companies in the banking industry out of total sample size of 1836.

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Table 7 shows the *MARKET SIZE* by city for financial year 2013. In Table 7, the total numbers of the companies located in a city, sums of their total assets and the sums of their sales are shown. In Table 7 only Australian cities have been considered. Sydney has the highest sum of total assets and the highest sum of total revenues. Sydney has the biggest *MARKET SIZE* as measured by total assets followed by Melbourne and then Brisbane. In the case of *MARKET SIZE* measured by sales, Sydney has biggest market size followed by Perth and then Melbourne.

However Perth has the highest numbers of companies 730, which is about 39.7% of the total sample size. As Table 7 shows Perth has a relatively smaller market size in spite of its highest frequency, which indicates smaller average size for the companies located in Perth.

In Table 8, Industries descriptive statistics shows the frequencies, medians and means of total assets by industries for change variables. The industry with the highest frequency is the Materials industry, Materials industry, with 588 companies, which is 39.4% of the total dataset.

Table 6 indicates that 18 industries out of the 24 industries have increased their total assets in financial 2014 as compared to financial year 2013.

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Table 6: Industry Descriptive Statistics (1) – Number and Total Assets

Industry Number	Industry Name	No. of companies	Median	Mean
1	Automobile & Components	7	11056000	34268010
2	Banks	13	3629741932	236491214873
3	Capital Goods	101	75076000	433031095
4	Commercial & Professional Services	57	60651964	536429909
5	Consumer Durables & Apparel	25	59063000	185089097
6	Consumer Services	35	92865500	903217287
7	Diversified Financials	128	53563000	2161296838
8	Energy	248	23937000	404285142
9	Food & Staples Retailing	4	22250200000	21806457118
10	Food Beverage & Tobacco	36	67979500	618306749
11	Health Care Equipment & Services	53	18389000	385984058
12	Household & Personal Products	3	93004000	110862333
13	Insurance	9	1633647000	32358301125
14	Materials	729	13187000	630907762
15	Media	29	43538500	2800897838
16	Pharmaceuticals, Biotechnology & Life Sciences	59	12623000	135871379
17	Real Estate	76	324076000	1856212836
18	Retailing	37	189306500	549521018
19	Semiconductors & Semiconductor Equipment	3	19090000	58052522
20	Software & Services	59	33779000	115415065
21	Technology Hardware & Equipment	20	17905000	57937640
22	Telecommunication Services	24	154102911	2093006967
23	Transportation	23	674477000	3659914090
24	Utilities	29	89924500	1259667736
	Other	27		
	Total	1836		

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Table 7: *MARKET SIZE* (1)

CITY	No. OF COMPANIES	SUM OF ASSETS	SUM OF SALES
ADELAIDE	77	93645390242	31943311143
BRISBANE	167	293919413513	64536487038
CAIRNS	3	136489000	5457142000
CANBERRA	3	192255000	26185078
DARWIN	1	36387000	37000
GOLD COAST	3	104374838	1032948930
HOBART	5	4359046932	434583230
LAUNCESTON	1	50596000	48349000
MELBOURNE	295	2021939292572	125928835550
NEWCASTLE	10	2606671242	267345555
PERTH	730	175011091287	231834751448
SYDNEY	486	23064366037692	252990567736
TOWNSVILLE	2	55461000	1361420000
WARRNAMBOOL	1	306564000	10149000
WOLLONGONG	1	9346000	12532
Others	51		
TOTAL	1836		

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Table 8: Industry Descriptive Statistics (2) - Number and Changes of Total Assets

Industry Number	Industry Name	No. of companies	Mean	Median
1	Materials	582	33525598	456078
2	Food Beverage & Tobacco	27	-28091127	-688860
3	Energy	182	5438690	802147
4	Diversified Financials	108	-123931525	-5614500
5	Commercial & Professional Services	52	-16091727	469809
6	Health Care Equipment & Services	47	33789992	-2284061
7	Software & Services	53	84802147	-2934000
8	Real Estate	65	26432951	-17411000
9	Capital Goods	73	99997917	1723000
10	Utilities	23	295406135	-13586814
11	Consumer Durables & Apparel	15	-14690919	264350
12	Telecommunication Services	23	84834607	-7164129
13	Retailing	29	16221819	-6019000
14	Consumer Services	25	66510555	-9261000
15	Food & Staples Retailing	4	98493165431	-19929350000
16	Technology Hardware & Equipment	17	-18626952	404488
17	Media	21	-10392471	473516
18	Automobile & Components	6	1927018	-1338264
19	Pharmaceuticals, Biotechnology & Life Sciences	51	768538307	-393353
20	Transportation	18	245376144	-15711000
21	Insurance	7	1843735714	-84027000
22	Banks	10	22067054700	-2201299465
23	Household & Personal Products	2	1913627	-1192000
22	Semiconductor & semiconductor Equipments	2	-14485094	2136014
	Other	22		
	Total	1465		

CHAPTER 4

ESTIMATION OF THE MODEL

The OLS regression model used to examine the association of audit fees and market size is similar to the model proposed by Francis *et al.* (2005) and Francis and Stokes (2003). However, total fees is more commonly used in audit literature, but here in this study, fees paid to the parent entity auditor is used to assess the robustness of results. The model as shown in section 0 is estimated with industry and year dummy variables, which are defined in Table 4 and section 0. The results of estimating the OLS regression model using two measures of *MARKET SIZE* are reported separately in Table 9 and Table 10.

Table 9 shows the results of the OLS regression model with audit fees paid to all auditors (FEE_{TOTAL}) as the dependent variable, and Table 10 shows the results of the model with audit fees paid to the auditor of parent entity (FEE_{PARENT}) as dependent variable.

In Table 9 and Table 10, Column (III) and column (V) reports the estimated regression coefficients of equation (1) where column (IV) and column (VI) report the p-values, using MARKET SIZE (ASSETS) and MARKET SIZE (SALE) as independent variable respectively.

Table 9: Regression Results for Audit Fees paid to the Auditor of Group Entity (FEE_{TOTAL})

VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
ASSETS	+	0.258	0.001	0.262	0.001
CATA	+	0.290	0.001	0.313	0.001
LEV	+	0.039	0.001	0.045	0.001
FOREIGN	+	0.074	0.001	0.062	0.002
$MSHARE_{PAR}$	+	0.304	0.001	0.296	0.001
MARKET SIZE (ASSETS)	+	0.102	0.001	-	-
MARKET SIZE (SALES)	+	-	-	0.120	0.001
NSEG	+	0.389	0.001	0.407	0.001
QUICK	-	-0.208	0.008	-0.229	0.004
REPORTLAG	+	0.039	0.524	0.002	0.973
ROA	-	0.021	0.001	-0.020	0.001
SALE	+	0.068	0.001	0.071	0.001
BIG4	+	0.193	0.001	0.203	0.001
LOSS	+	0.006	0.706	0.260	0.793
NONJUNE	+	0.075	0.001	0.0831	0.001
OPINION	+	0.064	0.001	0.068	0.001
Adjusted R^2		76.4%		75.7%	
N		*1836*		*1836*	
Industry Dummy		Yes		Yes	
Year Dummy		Yes		Yes	

Note: The table presents OLS regression results for Audit fee paid to total entities (FEE_{TOTAL}). Column of (III) in the table reports the values for *MARKET SIZE (ASSETS)* used as independent variable where column (V) which happened to the right side in the table, reports the values when the *MARKET SIZE (SALE)* is used as independent variable. P-values are given in column (IV) and column (VI). See Table 4 section 0 for the definitions of the independent variables. P-values, less than 0.001 are shown as 0.001

Table 10: Regression Results for Audit Fees paid to the Auditor of Parent Entities (FEE_{Parent})

VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
ASSETS	+	0.249	0.001	0.253	0.001
CATA	+	0.267	0.001	0.287	0.001
LEV	+	0.042	0.001	0.047	0.001
FOREIGN	+	0.011	0.511	-0.001	0.930
$MSHARE_{PAR}$	+	0.292	0.001	0.276	0.001
MARKET SIZE (ASSETS)	+	0.102	0.001	-	-
MARKET SIZE (SALES)	+	-	-	0.110	0.001
NSEG	+	0.342	0.001	0.360	0.001
QUICK	-	-0.192	0.013	-0.211	0.007
REPORTLAG	+	-0.005	0.926	-0.042	0.501
ROA	-	0.020	0.001	-0.020	0.001
SALE	+	0.063	0.001	0.066	0.001
BIG4	+	0.181	0.001	0.191	0.001
LOSS	+	0.003	0.850	0.001	0.938
NONJUNE	+	0.053	0.004	0.060	0.002
OPINION	+	0.066	0.001	0.071	0.001
Adjusted R^2		75.8%		74.5%	
N		*1836*		*1836*	
Year Dummy		Yes		Yes	
Industry Dummy		Yes		Yes	

Note: The table presents OLS regression results for Audit fee (FEE_{PARENT}). Column (III) in the table reports the values for *MARKET SIZE (ASSETS)* where column (V) which happened to the right side in the table, reports the values for the *MARKET SIZE (SALE)* used in the group of independent variable in the model. P-values are given in column (IV) and column (VI). P-values, less than 0.001 are shown as 0.001

Column (II) in Table 9 and Table 10 presents the expected signs of the coefficients, which are positive for all variables in the model except for *QUICK*, *REPORTLAG*, *ROA* and *LOSS.* Table 9 and Table 10 show that all statistically significant variables are consistent with the expected signs except for *ROA* in the model with *MARKET SIZE (ASSETS).* The results also show variables with p-values less than 0.005, which indicate a significant relation with the audit fees. All control variables in the model are statistically significant except for *QUICK*, *REPORTLAG*, and *LOSS*, and *FOREIGN* is only statistically significant while using FEE_{TOTAL} as the dependent variable.

Table 9 and Table 10 report consistent results for the coefficient signs of all variables, indicating that the results are quite robust.

All control variables in the model which are statistically significant have a positive impact on the audit fees (*FEE*) except *ROA* in *MARKET SIZE (SALE)* group.

The adjusted R^2 values for all four models are higher than 74%, which means that the model explains of above 74% of the variation fees, which is consistent with prior studies (Ferguson *et al.* 2003).

Variance inflation factors (VIF) are calculated to ascertain if multicollinearity is likely to cause problem in the regression analysis. The VIFs for *QUICK* and *CATA* both higher than 14, which suggests multicollinearity could be causing problems. Other variables have VIF value close to one. However, the coefficient estimates for the variances are consistent with expectations and both variables are established variables in the audit literature (see for example, Ferguson et al 2003 with Australian data and Mnutti-Meza 2013 with US data). Therefore I retain *QUICK* and *CATA* in the models for my main tests. It should be noted that the inferences about the MARKET SIZE coefficients are unchanged if either one of the variables QUICK or CATA are omitted from the model.

The regression results suggest that the *MARKET SIZE (ASSETS)* and *MARKET SIZE (SALE)* coefficient are both statistically significant at a level of 0.005 and have a positive impact on audit fees. The relations with audit fees are not only statistically significant, but are also economically important. For example, a one standard deviation increase in *MARKET SIZE (ASSETS)* is associated with an increase of about 6.47 [1] percent in audit fees. Though the economical importance of the *MARKET SIZE (SALE)* is comparatively smaller than the economic importance of Market size (Assets), but economical importance of market sizes associated with each audit fees of group entities (FEE_{TOTAL}) and parent entities (FEE_{PARENT}) are not different in term of statistical significance of the variables and sign of coefficients. For instance, a one standard deviation increase in *MARKET SIZE (SALE)* is associated with an increase of about 4.08 percent in audit fees (FEE_{TOTAL}) and an increase of about 3.74 percent in audit fees (FEE_{PARENT}).

The coefficient for the *ASSETS* variable and audit fees is statistically significant (as seen in Table 9 and Table 10), and the variable has also the highest economically importance in the model. For example, a one standard deviation increase in *ASSETS* is associated with an increase of about 32 percent in audit fees (FEE_{TOTAL}) and an increase of about 31 percent in audit fees (FEE_{PARENT}).

The economical importance of *ASSETS* in relation with audit fees (FEE_{TOTAL}) and audit fees (FEE_{PARENT}) are same either *ASSETS* is used with *MARKET SIZE (SALE)* or *MARKET SIZE (ASSETS).*

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[1] This is estimated by $e^{(z*r)}$ -1 where "*e*" is the exponential function; *"z"* is the regression coefficient on the relevant continuous variable and *r* is standard deviation. For example, if the variable is *MARKET SIZE (ASSETS)* as in the above case it is, then *z* is the regression co-efficient on *MARKET SIZE(ASSETS*); and *r* is the standard deviation of *MARKET SIZE (ASSETS)*. This procedure is described in Simon and Francis (1988).

These results are in contradiction to my hypotheses, which I have developed in section 0. So I reject my Null Hypothesis (H_o) that market size has no impact on the audit fees. The results of the OLS regression model as discussed above in details show that market size was positively correlated to the audit fees. To check the reliability of the relation more precisely between audit fees and market size, I use a client fixed effect model in our study. The results of the fixed effect model are given in Table 11, and Table 12.

Table 11: Regression Results for Change Audit Fees paid to the Auditor of Group Entity (ΔFEE_{TOTAL})

VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
Δ ASSETS	+	0.186	0.001	0.180	0.001
Δ CATA	+	0.039	0.651	0.027	0.749
Δ LEV	+	0.016	0.428	0.190	0.363
Δ FOREIGN	+	0.046	0.195	0.036	0.310
Δ $MSHARE_{PAR}$	+	0.280	0.001	0.305	0.001
Δ MARKET SIZE (ASSETS)	+	0.045	0.010	-	-
Δ MARKET SIZE (SALES)	+	-	-	0.091	0.006
Δ NSEG	+	-0.014	0.739	0.016	0.708
Δ QUICK	-	- 0.003	0.970	-0.006	0.943
Δ REPORTLAG	+	0.108	0.032	0.123	0.014
Δ ROA	-	-0.084	0.001	-0.081	0.001
Δ SALE	+	0.017	0.127	0.016	0.161
Δ BIG4	+	-0.004	0.722	0.002	0.819
Δ LOSS	+	0.0004	0.959	0.001	0.929
Δ NONJUNE	+	0.016	0.719	0.010	0.809
Δ OPINION	+	0.004	0.719	0.005	0.634
Adjusted R^2		12.9%		12.20%	
N		*1465*		*1465*	
Industry Dummy		No		No	
Year Dummy		Yes		Yes	

Note: The table presents client fixed effect regression results for the difference of Audit fee paid to group entities (FEE_{TOTAL}) of financial year 2013 and financial year 2014.The dependent variable is $\Delta FEE_{TOTAL,}$ natural logarithm of change of audit fees paid to the auditor of the group entities. Column (III) in the table reports the values for *ΔMARKET SIZE (ASSETS)* used as independent variable where column (V) side reports the values when the *ΔMARKET SIZE (SALE)*is used as independent variable. P-values are given in column (IV) and column (VI). P-values, less than 0.001 are shown as 0.001

Table 12: Regression Results for Change Audit Fees paid to the Auditor of Group Entity (ΔFEE_{PARENT})

VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
Δ ASSETS	+	0.164	0.001	0.160	0.001
Δ CATA	+	0.045	0.612	0.038	0.672
Δ LEV	+	0.014	0.500	0.014	0.444
Δ FOREIGN	+	0.027	0.464	0.018	0.620
Δ $MSHARE_{PAR}$	+	0.240	0.001	0.261	0.001
Δ MARKET SIZE (ASSETS)	+	0.035	0.050	-	-
Δ MARKET SIZE (SALES)	+	-	-	0.062	0.044
Δ NSEG	+	0.040	0.348	0.040	0.380
Δ QUICK	-	-0.026	0.738	-0.021	0.847
Δ REPORTLAG	+	0.069	0.157	0.082	0.105
Δ ROA	-	-0.072	0.001	-0.071	0.001
Δ SALE	+	0.024	0.078	0.020	0.091
Δ BIG4	+	-0.006	0.629	-0.001	0.993
Δ LOSS	+	0.005	0.689	0.005	0.665
Δ NONJUNE	+	0.024	0.599	0.019	0.670
Δ OPINION	+	0.009	0.461	0.010	0.397
Adjusted R^2		10.6%		10.11%	
N		*1465*		*1465*	
Industry Dummy		No		No	
Year Dummy		Yes		Yes	

Note: The table presents fixed effect regression results for the difference of Audit fee paid to Parent entities (FEE_{PARENT}) of financial year 2013 and financial year 2014.The dependent variable is $\Delta FEE_{PARENT,}$ natural logarithm of change of audit fees paid to the auditor of the parent entities. Column (III) in the table reports the values for *ΔMARKET SIZE (ASSETS)* used as independent variable where column (V) which happened at the most right side in the table reports the values when the *ΔMARKET SIZE (SALE)* is used as independent variable. P-values are given in column (IV) and column (VI). P-values, less than 0.001 are shown as 0.001

Table11 and Table 12, shows the fixed effect regression results. The change in MARKET SIZE (SALE) and MARKET SIZE (ASSETS) are positive and significant at the 0.05 level. These results are consistent with the results of the OLS regression models shown in Table 9 and Table 10. Table 11 and Table 12, also show that the $\Delta ASSETS$, ΔROA, and $\Delta MSHARE_{PAR}$ are significant and consistent with the OLS regression model whereas $\Delta REPORTLAG$ and $\Delta LOSS$ are insignificant and also consistent with the OLS regression model. The variables other than the above mentioned variables are inconsistent with the OLS regression results and I don't have any explanation for the inconsistency. These results for the market size variables are also consistent with the results of the Pearson correlation matrixes as given in the Table 13.

Table 13: AUDIT FEES SAMPLE PEARSON CORRELATION MATRIX (1)

VARIABLES	*FEE_{PARENT}*	*FEE_{TOTAL}*	*ASSET*	*LEV*	*ROA*	*MARKET SIZE(SALE)*	*MARKET SIZE(Asset)*
FEE_{PARENT}							
FEE_{TOTAL}	0.98*						
ASSET	0.67*	0.68*					
LEV	0.023	0.018	-0.21*				
ROA	0.16*	0.16*	0.41*	-0.59*			
MARKET SIZE (SALE)	0.25*	0.24*	-0.062	-0.001	-0.004		
MARKET SIZE (ASSETS)	0.34*	0.34*	0.14*	0.09*	0.032	0.92*	
REPORTLAG	0.018	0.017	-0.32*	0.06*	-0.09*	0.08*	-0.10*
QUICK	-0.18*	-0.18*	-0.43*	0.18*	-0.24*	0.017	-0.011
OPINION	-0.19*	-0.19*	-0.36*	0.14*	-0.21*	0.001	-0.09*
CATA	-0.12*	-0.12*	-0.36*	0.19*	-0.21*	-0.003	-0.009
NONJUNE	0.14*	0.16*	0.15*	0.05*	-0.006	-0.004	0.07*
FOREIGN	0.07*	0.11*	0.037	-0.008	0.006	0.065	0.038
LOGNSEG	0.44*	0.47*	0.32*	0.008	0.05*	-0.029	0.11*
LOGSALE	0.54*	0.55*	0.74*	-0.005	0.26*	-0.08*	0.23*
$MSHARE_{PAR}$	0.27*	0.28*	0.21*	0.045	0.023	-0.48*	-0.20*
LOSS	-0.41*	-0.41*	-0.50*	-0.016	-0.24*	0.09*	-0.18*
BIG4	0.39*	0.40*	0.37*	-0.019	0.10*	-0.09*	0.12*

(Table 13 is continued on the next page**)**

Table 13 continued

	REPORTLAG	*QUICK*	*OPINION*	*CATA*	*NONJUNE*	*FOREIGN*	*LOGNSEG*	*LOGSALE*	*MSHARE$_{PAR}$*	*LOSS*
REPORTLAG										
QUICK	0.018									
OPINION	0.200	-0.058								
CATA	-0.002	0.957	-0.08*							
NONJUNE	-0.044	-0.026	-0.06*	-0.017						
FOREIGN	0.104	0.028	0.05*	0.017	0.15*					
LOG*NSEG*	-0.008	-0.076	-0.07*	-0.035	0.025	0.28*				
LOG*SALE*	-0.226	-0.107	-0.37*	-0.07*	0.12*	-0.001	0.36*			
MSHARE$_{PAR}$	-0.117	-0.028	-0.10*	0.007	0.06*	-0.010	0.15*	0.28*		
LOSS	0.241	0.129	0.32*	0.07*	-0.08*	0.05*	-0.16*	-0.57*	-0.23*	
BIG	-0.191	-0.118	-0.13*	-0.10*	0.11*	-0.028	0.16*	0.36*	0.13*	-0.23*

Notes: The table shows Pearson correlation coefficients for the variables used in regression analysis. The variables are defined in Table 4 and section 0.

* denotes two-tailed significance at the .10 level.

The univariate relation between the dependent variables audit fees (FEE_{PARENT}) and audit fees (FEE_{TOTAL}), and all the independent variables shown in the correlation matrix. These relations are consistent with the results in the OLS regression models, as shown in Table 9 and Table 10, except for the control variable *LEV* and the indicator variables *LOSS.* The control variable *LEV* is the only independent variable that is insignificant at the level of 0.1 in the correlation matrix.

The relation of the market size (assets) and market size (sale) with the dependent variables audit fees (FEE_{PARENT}) and audit fees (FEE_{TOTAL}) are significant in the correlation matrix, which are also consistent with the OLS regression model results.

The results of Pearson correlation matrix also show that all the correlation coefficients are consistent with the OLS regression model results except for *CATA* and *OPINION*. For *CATA* and *OPINION* correlation coefficients are negative in the correlation matrix, which shows their negative correlation with the audit fees. The correlation coefficients for both *MARKET SIZE (ASSETS)* and *MARKET SIZE (SALE)* with audit fees (FEE_{PARENT})and audit fees (FEE_{TOTAL}) are positives and consistent with the result of OLS regression model. The correlation matrix also reports a strong correlation between *MARKET SIZE (ASSETS)* and *MARKET SIZE (SALE).* The value of correlation coefficient for both market size measures is 0.924.

Table 14 reports the Pearson correlation coefficient values for difference variables for financial year 2013 and financial year 2014, which are calculated for measuring the strength of correlation of audit fees (FEE_{PARENT}) and audit fees (FEE_{TOTAL}) to the variables used in fixed effect regression model, while using statistical software *MINITAB.* The relation of the dependent variables audit fees (FEE_{PARENT}) and audit fees (FEE_{TOTAL}), with all independent variables used in fixed effect regression model, are consistent with the results in the OLS regression models, as shown in Table 9 and Table 10, and with correlation matrix used for financial year 2013 data as given in Table 13, except for market size (assets) variable that is insignificant in Table 14. The

consistency in results show the authenticity of the relation between market size and audit fees, which was the primary objectives of this study. Table 14 also indicates that the changes in audit fees are strongly correlated with one another have correlation coefficient values of 0.89 which close to the perfect correlation values of (+1), whereas the changes in the measures of market sizes are weakly correlated with a values of correlation coefficient of 0.22.

Table 14: AUDIT FEES SAMPLE PEARSON CORRELATION MATRIX (2)

ΔVARIABLES	*ΔFEE$_{PARENT}$*	*ΔFEE$_{TOTAL}$*	*ΔASSET*	*ΔLEV*	*ΔROA*	*ΔMARKET SIZE(SALE)*	*ΔMARKET SIZE(Asset)*
ΔFEE$_{PARENT}$							
ΔFEE$_{TOTAL}$	0.89*						
ΔASSET	0.17*	0.20*					
ΔLEV	0.016	0.056	-0.23*				
ΔROA	-0.040	-0.05*	0.46*	-0.25*			
ΔMARKET SIZE (SALE)	0.05*	0.06*	0.09*	-0.003	0.032		
ΔMARKET SIZE (ASSETS)	0.026	0.032	0.007	0.06*	0.004	0.22*	
ΔREPORTLAG	0.06*	0.07*	0.04*	0.13*	0.006	0.074	0.09*
ΔQUICK	0.023	0.041	-0.22*	0.15*	-0.12*	0.002	-0.017
*Δ*OPINION	0.040	0.031	-0.06*	0.14*	-0.09*	0.04*	0.06*
ΔCATA	0.025	0.042	-0.22*	0.18*	-0.12*	0.009	-0.017
ΔNONJUNE	0.07*	0.06*	0.05*	0.06*	0.026	0.09*	0.10*
ΔFOREIGN	0.07*	0.09*	0.06*	0.035	0.06*	0.14*	0.038
ΔLOGNSEG	0.09*	0.63*	0.07*	0.06*	0.016	0.036	0.043
ΔLOGSALE	0.10*	0.10*	0.22*	-0.08*	0.01*	0.05*	-0.021
ΔMSHARE$_{PAR}$	0.18*	0.20*	0.25*	0.06*	0.035	-0.27*	-0.16*
ΔLOSS	0.046	0.05*	-0.07*	-0.04*	-0.32*	0.05*	-0.029
ΔBIG4	-0.001	0.009	-0.027	0.06*	0.003	-0.07*	0.10*

(Table 14 is continued on the next page**)**

Table 14 continued

	ΔREPORTLAG	*ΔQUICK*	*ΔOPINION*	*ΔCATA*	*ΔNONJUNE*	*ΔFOREIGN*	*ΔLOGNSEG*	*ΔLOGSALE*	*ΔMSHARE$_{PAR}$*	*ΔLOSS*
ΔREPORTLAG										
ΔQUICK	0.06*									
ΔOPINION	0.06*	-0.09*								
ΔCATA	0.07*	0.97*	-0.10*							
ΔNONJUNE	0.04*	0.06*	0.12*	-0.06*						
ΔFOREIGN	0.09*	0.004	0.18*	-0.000	0.24*					
ΔLOGNSEG	0.01*	0.04*	-0.005	0.030	0.09*	0.034				
ΔLOGSALE	0.010	0.06*	-0.05*	-0.06*	0.041	0.023	0.07*			
ΔMSHARE$_{PAR}$	0.08*	0.07*	-0.017	0.07*	0.11*	0.12*	0.11*	0.032		
ΔLOSS	0.026	0.035	0.26*	0.04*	0.14*	0.30*	0.006	-0.10*	0.031	
ΔBIG	0.040	0.05*	-0.07*	-0.04*	0.06*	0.083	0.037	-0.031	0.04*	0.09*

Notes: The table shows Pearson correlation coefficients for the variables used in regression analysis. The variables are defined in Table 4 and section 0.

* denotes two-tailed significance at the .10 level

4.1 ADDITIONAL TESTS

4.1.1 Additional OLS estimate:

I also estimated the model using 2014 data but do not include these results in the main results because at the time of writing the complete data set could not be obtained. The results shown in the Appendix A and Appendix B indicate that market size and audit fees are positively related and statistically significant at level 0.05. The results using 2014 data are consistent for 75% of the variables used in the models with the OLS result using 2013 data. I conclude that the positive relation between audit fees and market size is a robust result.

4.1.2 Normality Check:

Residual plots are used to examine the normality and error independence assumptions of the OLS regression model. Four different residual plots are shown in Appendix C, to look at the residual in four different ways. The normal plot of residuals verifies the assumption that the residuals are normally distributed. I also checked the normality of individual variables and found them normally distributed. The residual versus fits plot shows that the residuals appear to be random. The weak correlation of the residuals with each other is shown in the appendix by the residual versus the order of data plot. The histogram of the residuals determines the skewness of the data. The histogram of the residuals doesn't report skewness in the data set. Overall, the residual analysis suggests that the assumptions of normality and independence of errors are not violated.

4.1.2 Model specification check:

I used the Minitab best subset procedure to identify the best fitting regression model and the procedure suggested that the *LOSS* variable be omitted when FEE_{TOTAL} is used as depended variable and *NONJUNE* variable be omitted when FEE_{PARENT} is used as depended variable. The best subset procedure suggested two different models for two different measures of depended variables. However, given that the *LOSS* and *NONJUNE* are both established dummy variable in the audit literature (see for example, Ferguson et al 2003 with Australian data and Mnutti-Meza 2013 with US data), I retain both *LOSS* and *NONJUNE* in the models for my main tests. It should be noted that the inferences about the MARKET SIZE coefficients are unchanged if *LOSS* and *NONJUNE* is omitted. The results of the best subset regression are given in Appendix D and Appendix E.

CHAPTER 5

CONCLUSION

In this study, evidence on the association between audit fees and market size has been shown.

I used two different measures of the market size, namely *MARKET SIZE (ASSETS)* and *MARKET SIZE (SALE)* and find their relations with audit fees to be positive. I also use two different dependent variables, namely audit fees (FEE_{PARENT}) and audit fees (FEE_{TOTAL}) to check the robustness of the results. Consistent evidence is obtained from using these different variables.

It was found that the relation between audit fees and market size is not only statistically significant but also has economic importance. For example, my estimates of a one standard deviation in market size range from 3.7% to 6.5%. The results of the two models are consistent with one another. The client fixed effect model is used to reduce the threat of omitted variable bias. The correlation matrix results are generally consistent with the results of both the OLS and the fixed effect model.

It is also found that the relations between audit fees with various independent variables used in the model such as *CATA*, *LEV*, *FOREIGN*, $MSHARE_{PAR}$ had statistical significance except *QUICK*, *REPORTLAG*, and *LOSS*, which were statistically insignificant. For all significant variables the coefficients had the same sign as expected except for *ROA*. Positive signs were expected for market sizes in relation with audit fees, which were found to be positive in the results of both regression models.

This study has important implications for regulators, audit clients, auditors and researchers. For regulators, it would seem that drawing conclusions about the implications of reduced audit fees for audit quality should incorporate a consideration of market size. For audit clients, other factors equal, shifting to smaller-sized audit markets could result in cost savings. Although it is important to note here that audit quality may also change if a client moves to a smaller market. And there are other, non-audit-related factors that clients should consider before moving to another market such as, access to suppliers, however, capitalizes resources and so on. For auditors, there may be more potential to adopt different competitive strategies in larger markets. For example, given that larger markets have higher fees, cost savings may be easier to find, suggesting that some more efficient auditors could adopt a strategy to compete on price more easily in larger markets. For researchers, estimating the commonly-used audit fee model from Simunic (1980), it would seem that market size proxy is an important variable to include in the model, to reduce the possibility of coefficient bias. I leave these possibilities for future research.

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Appendixes

Appendix A

Regression Results for Audit Fees paid to the Auditor of Group Entity (FEE_{PARENT}) -2014

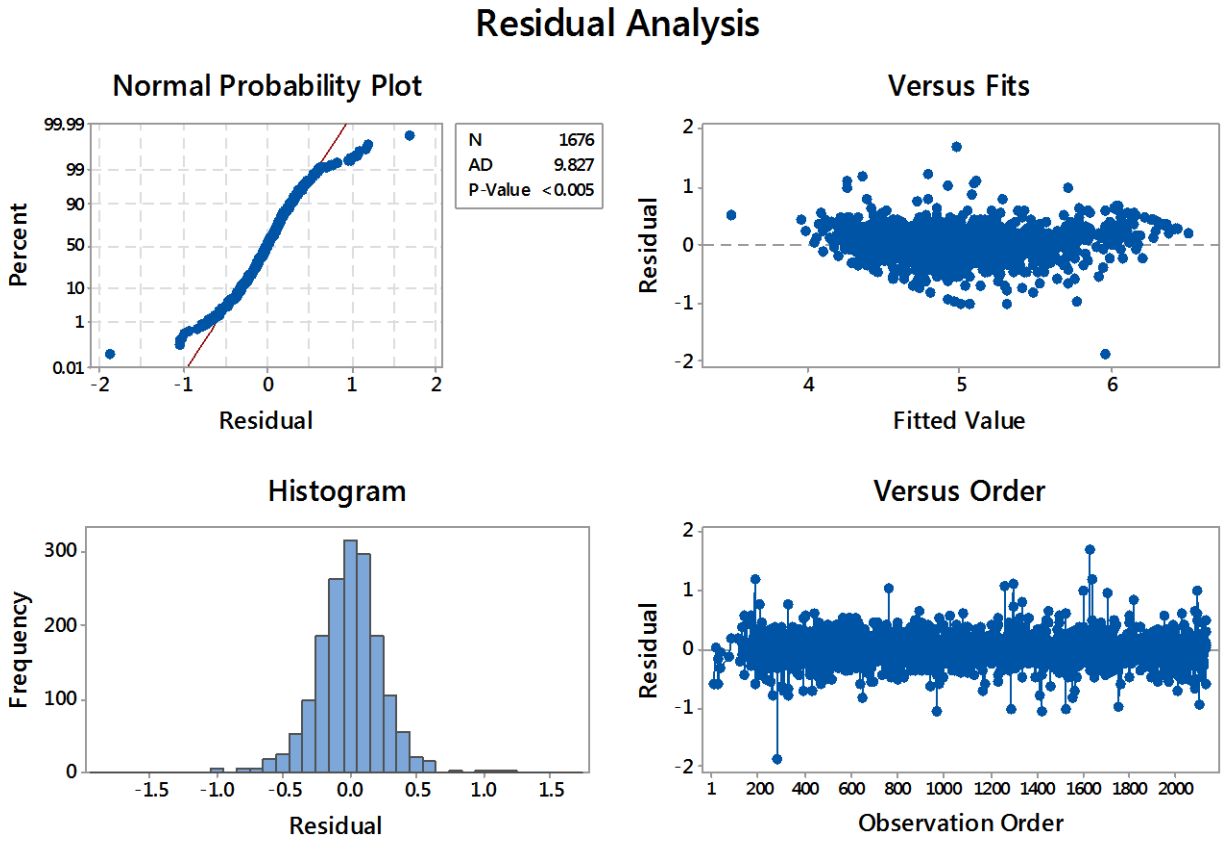
VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
ASSETS	+	0.269	0.001	0.276	0.001
CATA	+	0.086	0.273	0.108	0.175
LEV	+	0.045	0.001	0.480	0.001
FOREIGN	+	0.036	0.070	0.033	0.105
$MSHARE_{PAR}$	+	0.345	0.001	0.345	0.001
MARKET SIZE (ASSETS)	+	0.113	0.001	-	-
MARKET SIZE (SALES)	+	-	-	0.104	0.001
NSEG	+	0.417	0.001	0.413	0.001
QUICK	-	0.041	0.597	0.022	0.781
REPORTLAG	+	0.148	0.009	0.162	0.005
ROA	-	-0.019	0.001	-0.019	0.001
SALE	+	0.088	0.001	0.091	0.001
BIG4	+	0.070	0.001	0.064	0.001
LOSS	+	0.061	0.001	0.060	0.001
NONJUNE	+	0.087	0.020	0.093	0.015
OPINION	+	0.045	0.007	0.050	0.003
Adjusted R^2		80.34%		80.22%	
N		1492		1492	
Year Dummy		Yes		Yes	
Industry Dummy		Yes		Yes	

Appendix B

Regression Results for Audit Fees paid to the Auditor of Group Entity (FEE_{TOTAL}) -2014

VARIABLES (I)	EXPECTED SIGN (II)	CO-EFFICIENT (III)	P-VALUES (IV)	CO-EFFICIENT (V)	P-VALUES (VI)
ASSETS	+	0.276	0.001	0.282	0.001
CATA	+	0.120	0.129	0.143	0.075
LEV	+	0.045	0.001	0.048	0.001
FOREIGN	+	0.011	0.001	0.017	0.001
$MSHARE_{PAR}$	+	0.348	0.001	0.296	0.001
MARKET SIZE (ASSETS)	+	0.112	0.001	-	-
MARKET SIZE (SALES)	+	-	-	0.109	0.001
NSEG	+	0.451	0.001	0.446	0.001
QUICK	-	0.017	0.831	-0.003	0.963
REPORTLAG	+	0.183	0.001	0.194	0.001
ROA	-	-0.019	0.001	-0.019	0.001
SALE	+	0.094	0.001	0.097	0.001
BIG4	+	0.075	0.001	0.081	0.001
LOSS	+	0.073	0.001	0.718	0.001
NONJUNE	+	0.090	0.017	0.095	0.013
OPINION	+	0.044	0.009	0.050	0.004
Adjusted R^2		81.5%		80.8%	
N		1492		1492	
Industry Dummy		Yes		Yes	
Year Dummy		Yes		Yes	

Appendix C


Residual Analysis
Normal Probability Plot
Percent
99.99
99
90
50
10
1
0.01
-2
-1
0
1
2
Residual
N 1676
AD 9.827
P-Value <0.005
Versus Fits
Residual
2
1
0
-1
-2
4
5
6
Fitted Value
Histogram
Frequency
300
200
100
0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Residual
Versus Order
Residual
2
1
0
-1
-2
1
200
400
600
800
1000
1200
1400
1600
1800
2000
Observation Order

Appendix D

Best Subsets Regression:

Vars	R-Sq	R-Sq (adj)	R-Sq (pred)	Mallows Cp	S	ASSET	LEV	ROA	REPORTLAG	QUICK	OPINION	CATA	NONJUNE	FOREIGN	LOGNSEG	LOGSALE	MSHARE	LOSS	BIG
1	59.2	59.1	59.0	854.0	0.32250	X													
1	54.1	54.1	53.9	1165.5	0.34182											X			
2	64.8	64.7	64.6	509.2	0.29962	X										X			
2	63.5	63.5	63.3	584.7	0.30477	X									X				
3	67.6	67.5	67.4	334.4	0.28728	X									X	X			
3	67.0	66.9	66.8	371.9	0.28996	X	X									X			
4	69.6	69.5	69.3	215.2	0.27852	X	X								X	X			
4	69.4	69.3	69.1	227.5	0.27944	X		X							X	X			
5	70.8	70.7	70.5	141.5	0.27294	X	X								X	X			X
5	70.5	70.4	70.2	159.0	0.27426	X		X							X	X			X
6	71.6	71.5	71.2	95.5	0.26937	X	X								X	X	X		X
6	71.4	71.2	71.0	109.7	0.27045	X	X					X			X	X			X
7	72.1	71.9	71.7	67.7	0.26715	X	X					X			X	X	X		X
7	72.0	71.9	71.6	72.8	0.26754	X	X	X							X	X	X		X
8	72.6	72.4	72.1	38.5	0.26480	X	X				X	X			X	X	X		X
8	72.5	72.3	72.0	45.0	0.26531	X	X	X				X			X	X	X		X
9	73.0	72.8	72.5	17.3	0.26306	X	X	X			X	X			X	X	X		X
9	72.7	72.6	72.3	29.9	0.26405	X	X	X		X	X				X	X	X		X
10	73.1	72.9	72.5	13.0	0.26265	X	X	X			X	X	X		X	X	X		X
10	73.0	72.8	72.5	14.8	0.26279	X	X	X		X	X	X			X	X	X		X
11	73.1	72.9	72.6	10.3	0.26235	X	X	X		X	X	X	X		X	X	X		X
11	73.1	72.9	72.5	14.9	0.26271	X	X	X			X	X	X		X	X	X	X	X
12	73.1	72.9	72.5	12.2	0.26242	X	X	X		X	X	X	X		X	X	X	X	X
12	73.1	72.9	72.6	12.2	0.26242	X	X	X		X	X	X	X	X	X	X	X		X
13	73.1	72.9	72.5	14.1	0.26249	X	X	X	X	X	X	X	X		X	X	X	X	X
13	73.1	72.9	72.5	14.1	0.26249	X	X	X		X	X	X	X	X	X	X	X	X	X
14	73.1	72.9	72.5	16.0	0.26256	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Response is FEE(PARENT)
Market Size (SALE)is included in all models

Appendix E

Best Subsets Regression:

Vars	R-Sq	R-Sq (adj)	R-Sq (pred)	Mallows Cp	S	ASSET	LEV	ROA	REPORTLAG	QUICK	OPINION	CATA	NONJUNE	FOREIGN	LOGNSEG	LOGSALE	MSHARE	LOSS	BIG
1	59.9	59.8	59.7	998.1	0.33476	X													
1	54.9	54.8	54.7	1332.3	0.35511											X			
2	65.6	65.5	65.4	619.4	0.31005	X										X			
2	65.3	65.3	65.1	639.0	0.31138	X									X				
3	69.3	69.2	69.1	374.7	0.29294	X									X	X			
3	67.9	67.8	67.6	470.2	0.29972	X	X								X				
4	71.1	71.0	70.8	260.6	0.28458	X	X								X	X			
4	71.0	70.9	70.7	267.4	0.28507	X		X							X	X			
5	72.2	72.1	71.9	186.6	0.27898	X	X								X	X			X
5	72.0	71.9	71.8	198.8	0.27990	X		X							X	X			X
6	73.0	72.9	72.6	134.2	0.27493	X	X								X	X	X		X
6	72.9	72.7	72.5	145.7	0.27581	X		X							X	X	X		X
7	73.5	73.4	73.1	101.9	0.27237	X	X					X			X	X	X		X
7	73.4	73.3	73.0	109.5	0.27295	X		X				X			X	X	X		X
8	74.1	73.9	73.6	68.0	0.26965	X	X				X	X			X	X	X		X
8	74.0	73.9	73.6	70.8	0.26988	X		X			X	X			X	X	X		X
9	74.4	74.3	74.0	45.4	0.26781	X	X	X			X	X			X	X	X		X
9	74.4	74.2	73.9	50.5	0.26821	X	X				X	X	X		X	X	X		X
10	74.7	74.6	74.2	27.8	0.26634	X	X	X			X	X		X	X	X	X		X
10	74.7	74.6	74.2	28.4	0.26639	X	X	X			X	X	X		X	X	X		X
11	74.9	74.8	74.4	16.4	0.26536	X	X	X			X	X	X	X	X	X	X		X
11	74.8	74.6	74.3	25.1	0.26605	X	X	X		X	X	X		X	X	X	X		X
12	75.0	74.8	74.5	13.5	0.26504	X	X	X		X	X	X	X	X	X	X	X		X
12	75.0	74.8	74.4	16.7	0.26530	X	X	X	X		X	X	X	X	X	X	X		X
13	75.0	74.8	74.4	14.0	0.26501	X	X	X	X	X	X	X	X	X	X	X	X		X
13	75.0	74.8	74.4	15.5	0.26512	X	X	X		X	X	X	X	X	X	X	X	X	X
14	75.0	74.8	74.4	16.0	0.26508	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Response is FEE (Total)
Market Size (SALE)is included in all models