

Determinants of audit fees of listed South African companies

By

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Supervisor: Darron West

February 2015

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Abstract

This paper identifies the statistically significant determinants for audit fees in the South African market by regressing audit fees against a selected set of determinant variables. This study is not the first investigating the South African market and so broadens the existing body of research both within the country as well as the global body of research.

Determinant variables identified in prior research across the globe were used to establish the existence of a relationship in the local market. This study further extended the local body of research by considering the implication of audit timing and location on the audit fee as well as using more recent data.

A positive statistically significant relationship was found between audit fees, asset value, proportion of assets held as inventory and accounts receivables and the number of subsidiaries. In contrast to prior local research, results showed that a large audit firm fee premium did not exist. This was shown to be due to the commoditisation of auditing, cost pressures from companies and increased competition within the audit market. Audits within the Gauteng region were priced at a premium to other provinces whilst the timing of the audit has a statistically significant impact on the audit fee.

The validity of the model has improved in comparison to prior South African studies as a result of audit fees being further driven by audit complexity than by size of the auditee.

This study is dedicated to Qaasim Isaacs and the millions of others around the world who haven't received the gift of education.

Table of Contents

| | |
|--|-----------|
| Introduction..... | 1 |
| Review of relevant literature..... | 3 |
| Legislative requirements pertaining to an audit in South Africa..... | 3 |
| Audit landscape in South Africa..... | 4 |
| Prior literature..... | 7 |
| <i>Factor determination.....</i> | <i>7</i> |
| <i>Complexity as a result of size.....</i> | <i>9</i> |
| <i>Inherent complexity.....</i> | <i>11</i> |
| <i>Risk.....</i> | <i>14</i> |
| <i>Ownership structure.....</i> | <i>15</i> |
| <i>Audit timing.....</i> | <i>16</i> |
| <i>Audit location.....</i> | <i>17</i> |
| <i>Audit firm size.....</i> | <i>18</i> |
| <i>Change in auditors.....</i> | <i>20</i> |
| Prior studies specific to South Africa..... | 20 |
| Literature review summary..... | 23 |
| Methodology and data description..... | 26 |
| Research Questions..... | 26 |
| Research Process..... | 27 |
| Data..... | 28 |
| <i>Independent variable selection.....</i> | <i>30</i> |
| Analysis of data and findings..... | 33 |
| Understanding the statistics..... | 33 |
| Outlining the findings..... | 35 |
| Analysing the findings..... | 38 |
| <i>A theoretical perspective.....</i> | <i>40</i> |
| <i>A practical perspective.....</i> | <i>41</i> |
| Concluding remarks..... | 43 |
| Summary of results..... | 43 |
| Areas for future research..... | 43 |
| Concluding remarks..... | 44 |
| References..... | 46 |
| Appendix A – JSE list of accredited auditors..... | 50 |

Introduction

The primary goal of the study is to determine factors which can be used to create an expectation of audit fees, to what extent and whether or not the variables are statistically significant. Identification of the significant issues affecting audit fees will provide both audit firms and clients the ability to assess the reasonability of the fee and aid in fee negotiations.

A secondary goal is to compare the determinants to those found in other countries. This paper will extend the body of research, which has studied the determinants of audit fees within the South African market, and contribute to a growing number of related studies around the world. The topic is relatively unexplored within South Africa.

The South African market has only recently emerged from Apartheid and celebrated its 20th year of freedom and democracy in 2014. The country is characterised by limited capital flow and a less sophisticated economic structure than its developed counterparts. Therefore a local study may result in the identification of different determinants to those found abroad. Furthermore a local study conducted prior to the global financial crises of 2008-2009 may be outdated.

Relevant literature will be considered in the next section focusing on the results of international studies before focusing on prior South African studies. Based on the literature, the research questions will be developed and described in the methodology section.

The methodology section will also detail the research approach and the data to be used. After following the detailed research approach the findings section will present the results of the data analysis, with further investigation and discussion of significant relationships found.

Finally, conclusions will be drawn based on the findings presented and the literature review, drawing comparisons between the expected result and the actual relationships found.

Review of relevant literature

This section provides both theoretical support for the determination of audit fees as well as an examination of global comparative studies. Where the word 'auditee' is used in this section reference is being made to the company which is being audited and employs the services of an audit firm.

Local statutory considerations are initially considered initially with extracts from relevant statutes provided. The seminal paper on the topic is identified and used as the basis for further investigation.

Specific detail is provided on studies performed in South Africa and their methodologies. The gap to be filled by this study and the difference between this study and prior South African studies is highlighted.

Legislative requirements pertaining to an audit in South Africa

The Companies Act No. 71 of 2008 ('the Companies Act') as amended by the Companies Amendment Act 3 of 2011 and the Companies Act Regulations 2011 came into effect on 1 May 2011 in the Republic of South Africa. Within its regulations the Act requires certain companies to be audited based on their public accountability.

Section 28 of the Companies Act requires all companies to keep accurate and complete accounting records in the form of financial statements. An audit is defined in the Auditing Profession Act No. 66 of 2005 as an "examination of, in accordance with prescribed or applicable auditing standards-

- Financial statements with the objective of expressing an opinion as to their fairness or compliance with an identified financial reporting framework and any statutory requirements; or
- Financial and other information, prepared in accordance with suitable criteria, with the objective of expressing an opinion on the financial and other information."

Section 30 of the Companies Act requires all public companies to be audited and to release annual financial statements within six months of the financial year-end or such shorter period as required by the annual general meeting. In the case of other companies it must be determined whether an audit is required in terms of the public interest score of the company. The public interest score is calculated by taking into account the annual turnover, size of the workforce and nature and extent of the company's activities (Companies Act, 2008).

Section 29 of the Companies Act requires the financial statements to satisfy financial reporting standards. In South Africa the financial reporting standard adopted and required for listed companies is the International Financial Reporting Standards (IFRS) developed by the International Accounting Standards Board.

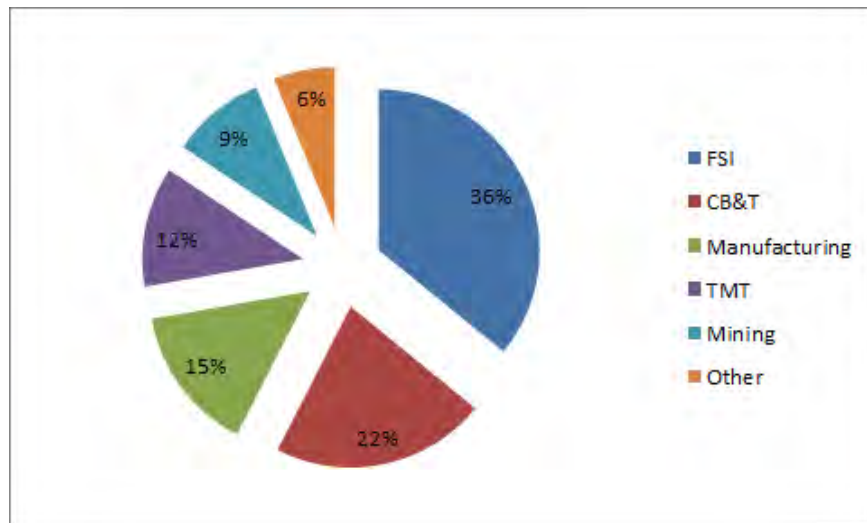
For this study, companies listed on the Johannesburg Stock Exchange (JSE) are considered as they are compelled to provide the public with audited annual financial statements which provide disclosure of the company's assets, liabilities and equity, as well as their income and expenses, and any other prescribed information. This information, which is in the public domain, can be used to ascertain the determinants of audit fees. The Companies Act requires disclosure of the audit fees incurred during the period. The annual financial statements will therefore provide the source data for this study.

Audit landscape in South Africa

The population of listed companies has been split into 6 distinct industry categories for the purposes of this study. The categories are based on the nature of the audit client's business operations. 'Technology, media and telecoms (TMT)', 'Consumer business and transportation (CBandT)', 'Manufacturing', 'Financial services industry (FSI)', 'Mining' and 'Other' are the sectors identified in this study. The composition of the listed market for audit fees is broken into these sectors over a five-year historical average during the period 2009 to 2013 in the diagram below. The five-year period was used to avoid including information prior to the

financial crises and information for 2014 was not available at the time of this study. This 5-year period is used for subsequent analysis as well. The information was obtained from McGregor Bfa which provided audit fees for each listed company per year.

Diagram A: Percentage of total market for audit fees broken down per industry sector



As at 25 April 2014 the JSE had 391 companies listed on the stock exchange per the JSE main board website (Available at: <https://www.jse.co.za/content/JSEContactDetailsItems/Auditors%20and%20their%20Advisors.pdf>, accessed 25 April 2014). All of these 391 companies would need to be audited in terms of the aforementioned legislation by a JSE-accredited firm of auditors. Only individuals registered with the Public Accountants' and Independent Regulatory Board for Auditors (IRBA) are entitled to accept appointments as auditors. Registration with IRBA requires certain entry and continuing practice requirements. Specific accreditation is required by the JSE to audit listed companies in terms of paragraph 22.1 of the JSE Listing Requirements. The list of JSE accredited audit firms as of 6 January 2014 is included in Appendix A. Whilst the listing has 33 audit firms with accreditation a handful of audit firms have historically and continue to dominate the market (Firer and Swartz, 2007).

Prior to 2002 the larger audit firms were termed the 'Big 8' which refers to "Price Waterhouse, Arthur Andersen, Peat Marwick Mitchell, Ernst and Whinney, Arthur Young, Coopers and Lybrand, Touche Ross, Deloitte Haskins and Sells" (Cobbin, 2002). 1989 saw the merger of Ernst and Whinney and Arthur Young as well as Deloitte Haskins and Sells and Touche Ross. Price Waterhouse and Coopers and Lybrand went on to form PWC whilst Peat Marwick Mitchell is now KPMG. Arthur Andersen surrendered their license in 2002 after being found guilty for misconduct in the audit of the Texas based energy company, Enron. Arthur Andersen's exit and Coopers and Lybrand's merger with Price Waterhouse resulted in only 6 dominant, large audit firms in the industry now. In 1995 within the South African audit market the Big 6 accounted for "in excess of 75 percent of the market for audits of publically traded clients" (Simon, 1995).

The Big 4 was coined after Ernst & Whinney merged with Arthur Young and Deloitte Haskins & Sells merged with Touche Ross leaving.

The international firms Deloitte & Touche (Deloitte), Ernst & Young (EY), KPMG and PricewaterhouseCoopers (PWC) currently dominate the South African market. Now collectively referred to as the 'Big 4' they made up 94% of the aggregate audit revenue in the listed market during the period 2009-2013 (McGregor Bfa. 2014). Deloitte marginally leads the pack whilst EY is the smallest of the four based on audit fee revenue. Smaller players also auditing entities listed on the JSE include Grant Thornton and BDO South Africa Inc.. These smaller firms account for 5% of the market. Refer to the illustration below detailing the change in market share by revenue over the last five years. The information used for Diagram B was obtained from McGregor Bfa which provided audit fees for each listed company per year and detailed who the audit firm responsible for the audit was.

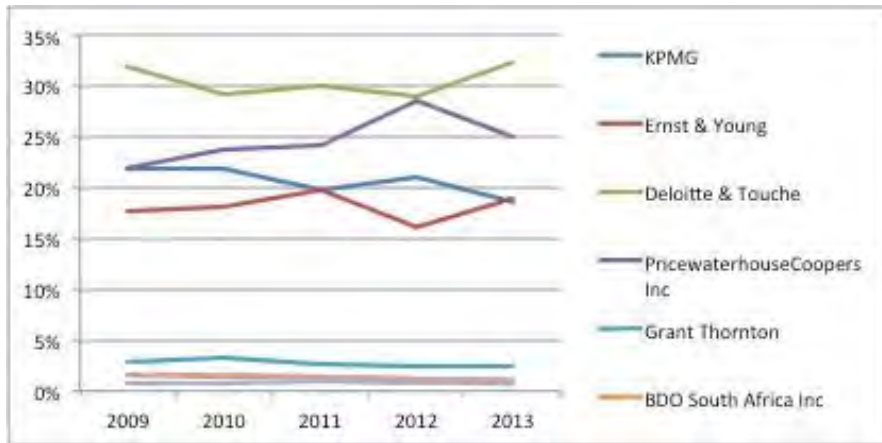


Diagram B: Percentage of market share based on audit fee revenue of listed market per audit firm

In order to gain an understanding of the possible variables (to be obtained from these annual financial statements) which may have an impact on the audit fee, prior literature is reviewed to guide the methodology. Factors outside of the scope of this study are also noted for the sake of completeness.

Prior literature

The literature review is restricted to post 1980 English language literature starting with the seminal work by Simunic. Simunic (1980) explored the topic under study in the United States of America and paved the way for studies to be done globally in order to understand the determinants of audit fees. “Although preceded by a small number of articles published in professional journals Simunic (1980) is considered the seminal work in the area” (Cobbin, 2002).

Following Simunic’s (1980) study “interest spread very quickly from the initial focus in the US to cover developed markets such as the UK, Canada, Australia, New Zealand, India and Ireland. The UK, Australia, India and Ireland were particularly well placed as research environments because of the statutory requirements for the disclosure of information related to audit fees” (Cobbin, 2002).

There has been a small body of recent studies performed on the topic. The area was of particular interest prior to the second millennium. Following this, research on audit fees has gravitated towards the impact of non-audit services, the impact of an increase in audit risk as a result of losses or qualified audit opinions on audit fees and investigating the impact of IFRS implementation on audit fees. Audit risk is covered in this study whilst non-audit services and IFRS implementation is not considered as all companies used in this study prepared their financial statements using IFRS for the entire period examined and non-audit services is outside of the scope of the study.

Factor determination

Central to all studies is the need to identify the factors which may have an impact on audit fees. Simunic’s (1980) ordinary least squares regression model found auditee size and complexity to be the main determinants. The study also found a

premium related to whether or not the audit firm was part of the Big 8 and found that Price Waterhouse demanded a higher premium than the others (Simunic, 1980). Studies since Simunic (1980) have all attempted to identify the determining variables of the auditee by adjusting their models and adding other factors. One of the most commonly added variables is an indicator of whether or not the audit is performed by a 'Big 4' audit firm. At the core of these models is an attempt to quantify the complexity of an auditee based on available information.

A more complex audit requires greater skills and time to be allocated to the audit, resulting in higher fees (Simunic, 1980). Audit firms are moving their audit approach towards a risk driven methodology, driven by the introduction of ISA 315 *Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment*, as opposed to a method of coverage, quantifying complexity may be more beneficial in the determination of audit fees. Coverage-based audit approaches aim to obtain sufficient and appropriate audit evidence to cover a certain percentage of any account balance or transaction. A risk-based approach is driven less by the size of the account balance or transaction and more by the nature of the account balance or transaction and the related risk levels.

Audit complexity requires more experienced staff who are charged out at higher rates, and the use of experts or lower level staff working for an increased amount of time, both of which increase fees. Prior studies have aimed to quantify the perceived complexity of the audit. "There is mixed evidence as to whether it is complexity in terms of scope of operations or in respect of balance sheet composition which has the most significant impact of the levels of fees" (P. Chen, Ezzamel, and Gwilliam, 1993).

Prior studies indicate size of the auditee as the most important indicator. The size of an auditee can be an indication of the complexity of the auditee but is not the only measure of complexity. The difficulty is determining the measure by which size is determined.

The nature of the auditee will result in inherent complications on the audit causing variations in audit fees across clients. Increased audit risk as well as differences in timing and location will also have an impact on the audit fee. The size of the audit firm can also play a part in the fee determination as dominant audit firms charge a premium for the services justifying it through higher quality services. These considerations will be individually investigated.

Complexity as a result of size

To quantify auditee size one possible measure is total assets due to the fact that “if audit firms adopt an audit approach which is essentially balance sheet based then this may be the most suitable measure” (P. Chen et al., 1993). A British study (Taylor and Baker, 1981) made use of total assets to determine size and the number of subsidiaries as a measure of complexity finding both to be significant determinants. Similar findings were made in the New Zealand and Norwegian market with total assets being a significant determinant of audit fee (Firth, 1997).

The problem with this measure is the differences in selection of accounting policies, depreciation policies and the existence of off balance sheet assets which may result in asset measurement differences in otherwise similar companies.

Off balance sheet assets such as operating leases will not form part of the asset base and are therefore not identified as part of total assets. Related account balances and transactions could comprise complex sections on the audit as a result of the onerous disclosure requirements surrounding these transactions. Revaluing property, plant and equipment (P, P and E) will overstate the asset base and therefore the implied complexity of the auditee. On the other hand, a revalued asset may require the use of an expert for consideration of the value if the value is not publicly available, thereby increasing the cost of the audit.

The composition of assets adds further complications in that if the asset base of one company is comprised of various items requiring different audit approaches

this will require more audit work. Audit approaches could involve confirmation procedures, checks for existence, use of experts or complex valuation techniques to be utilised. For example, an auditee with an asset base in similar value to another auditee but compromising only a single account (say, Accounts Receivable) would require only a single audit approach and can be simplified further given the use of sampling techniques to test the large population. The value of the asset base would therefore not be an appropriate indicator of the perceived complexity of the auditee.

To account for this, a model of determinants should include measures which determine the proportion of the asset base accounted for by inventory and Accounts Receivable due to their increased inherent risk on a client. The inherent risk is as a result of the client overstating these through recognition of non-existent or over valuation of the inventory items or Accounts Receivable. Valuation and existence issues around inventory and Accounts Receivable require more audit work to verify. As the inventory gets more specialized the complexity in determining the net realisable value in terms of IAS 2 Inventories (2003) increases. This is as a result of the inclusion of raw materials, labour and overheads into the conversion of raw materials into finished goods. The audit of the input costs complicates the audit approach. A prior study has found that in the technology sector the impact of specialized inventory can result in the determination of valuation of inventory to account for 25% of the audit fee (P. Chen et al., 1993). Recoverability of Accounts Receivable poses further problems given the time required to follow up with Accounts Receivable and determine if they agree with the outstanding balance and then considering if they will be able to repay the debt.

Another way to account for the problem with using asset size alluded to earlier is making use of an alternative measure for auditee size being the statement of comprehensive income value. Turnover can form the basis for this measurement since turnover measures “abstract from problems associated with accounting policy, financial structure, and capital intensity” (P. Chen et al., 1993). A United States study used total sales as a proxy for audit size (Wallace, 1984). The foreign proportion of sales can also be used as a measure of complexity and proved

significant in the Hong Kong and Malaysian markets (Rose, 1999). Total revenue was also found as a significant determinant on the Kuala Lumpur Stock Exchange (Che Ahmad, 1996).

“Sole focus on the determinants of audit fees continued with Wallace (1984) who used a simple model incorporating total sales as a size proxy along with foreign assets/total assets and the square root of audit locations and found each to be significant determinants” (Cobbin, 2002). Chen et al (1993) and Pong and Whittington (1994), in the UK and Che Ahmad (1996) in Malaysia instead argue in favour of the use of total revenue to avoid the drawbacks, relating to the issues of accounting policies and off balance sheet assets, of using total assets as the proxy for size as a result of differing accounting policies.

Total revenue can therefore also be used as a proxy for auditee size. Both total revenue and total asset size were found to be statistically significant variables measuring the size of the auditee in various studies and can form a starting point for the selection of variables.

Inherent complexity

Existence of subsidiaries

The nature of the auditee may also result in increased complexity. The existence of subsidiaries and group structures necessitates consolidation requiring the auditor to consider the accuracy and completeness of elimination of intercompany balances and transactions and alignment with group accounting policies. Ensuring that information used by the group as received from the components adds to the audit workload. “These concerns will be more pressing if subsidiaries are not wholly owned and the need to protect the interests of minorities has to be taken into account. If subsidiaries operate in a variety of different fields there are likely to be additional learning and expertise costs” (P. Chen et al., 1993).

Haskins and Williams (1988) found significant variables in the form of total assets for size of the auditee and number of subsidiaries as the measure for complexity. Similarly, an Australian study found total assets, number of subsidiaries and

current ratio to all be significant variables (Francis, 1984). Johnson (1995) found the number of subsidiaries to be a significant determinant and therefore an appropriate proxy for complexity of the auditee.

Consistent with Haskins and Williams (1988), Francis (1984) and Johnson (1995), Chung and Lindsay (1988) and Dugar et al (1995) found significant variables in the form of number of subsidiaries, foreign subsidiaries as a percentage of the total and measuring what proportion of assets consist of accounts receivables and inventory in Canada. The number of foreign subsidiaries was an extension on prior studies in order to differentiate between the types of subsidiaries.

Auditing a subsidiary may require the use of component auditors. Component auditors perform work on financial information related to a component of a group audit (Glover, Liljegren, Prawitt, and Messier, 2008). The use of component auditors increases control costs resulting in further monitoring required by the group auditors. This is more common where a company within the group is offshore. Some studies found that the proportion of foreign subsidiaries to total subsidiaries is a significant variable (Cobbin, 2002). This ratio may be capturing the impact of component auditors and the impact of increased control and monitoring costs on the audit fee.

In some countries subsidiaries are set up to avoid legislative or taxation burdens and are not operating subsidiaries but rather vehicles to exploit legislative loopholes. "Property groups may have many more subsidiaries than manufacturing groups of equivalent size so as to take advantage of the protection of limited liability on individual developments" (P. Chen et al., 1993). SA Corporate Real Estate Fund is an example of this, having multiple subsidiaries, each holding a different property. Given that these companies are all doing the same thing within the group the testing methodology can be replicated across the group and economies of scale realized, hence keeping the audit fee relatively low. The existence of dormant or near dormant companies further skews the implied complexity of the auditee. Dormant companies may still hold assets and therefore require consolidation, but there is no change in both existence and valuation of these assets year-on-year. Such companies increase the number of subsidiaries to

be audited but there is no concomitant complexity effect: they do not require as much audit work as a subsidiary still actively trading where the operations result in changing annual financial statements every year.

To account for the similarities in business lines of subsidiaries, segmental reporting information can be used to provide a level of operational diversification within the auditee. By considering the breakdown of revenue between various segments the complexity of the audit can be better understood. With multiple segments and various streams of revenue the auditor will have to test various forms thereby diminishing economies of scale in testing.

Haskins and Williams (1988) in contrast to the other studies mentioned in this section did not find the number of subsidiaries as a significant determinant of complexity and therefore audit fee in New Zealand, but did find it to be significant in Ireland. A later study from New Zealand by Johnson (1995) found the number of subsidiaries to be a significant factor as well as evidence of a large firm premium. The differences found in the subsequent study provide one example of how the relationship between audit fees and the determinants changes over time. It is therefore worthwhile considering the impact of this variable in this study considering that it has been found in foreign markets.

Auditee locations

Multiple locations will require the auditor to make use of further component auditors or travel between locations to obtain audit evidence. Wallace (1984) aimed to capture this increased complexity by including in his model factors to control for number of locations and the proportion of foreign assets to local assets. The number of auditee locations was also investigated and found to be significant as a factor by Gist (1992) in Gist's (1992) explanation of variability of audit fees.

Risk

An increase in audit risk results in an increase in the extent of testing thereby inflating the audit fee. Audit risk is the aggregation of detection risk, inherent risk and control risk. Detection risk is the risk that the auditor does not identify the fraud or error in the financial statements during the audit. Inherent risk is based on the nature of the auditee and their operations considering the probability of loss arising out of circumstances in the absence of any controls or modifications to the business environment. Control risk is dependent on the control environment of the auditee and describes the risk of fraud or error not being detected or corrected by the internal control mechanism of the client.

A quantification of risk can be included as a determinant of audit fees. Profitability of the auditee therefore has an impact on the risk of the client. A client with low profitability may be an indicator of going concern difficulty increasing the level of audit risk. This will require the auditor to seek further evidence regarding recoverability of assets and ensuring them of the applicability of the going concern assessment. This may result in further questions regarding valuation of assets and the adequacy of impairment in the period.

Craswell et al (1995) found the existence of a loss in the period under reporting to be a significant variable in relation to their determination of audit fees in Australia. This was more recently examined in a multi-country study by Hay, Knechel and Wong (2006) who aggregated results across more than 20 countries to evaluate the change of the impact of the determinants over time. Hay, Knechel and Wong (2006) found that a loss by the client has become a more significant variable by more recent studies. In the United States this was found to “only true to firms with relatively little regulation” (Rao & MacDonald, 2011).

Chen et al (1993) referred to this as “the need to extend the scope of the audit work to focus more directly on questions as to the value of assets on a break up basis, the status of the client as a going concern, cash flow forecasts, possible breaches of loan covenants, etc.” ‘Z’-scores were used in a study in the Western Australian market to act as a proxy for business risk but no significant relationship

was found with audit fee (Jubb, 1996). Jubb (1996) did however find a significant increase in audit fee in the year following qualification of the audit opinion. The qualification of the audit in the prior year increases audit risk for the current period. In contrast to this, a multi-country study found that a prior year qualified opinion was a statistically significant variable prior to 1990 but has lost importance since (Hay et al., 2006). Consistent across these studies is the statistical significance of a measure indicative of an increased audit risk.

As a further measure of risk, studies identified industry sector and the existence of a qualified audit opinion as significant determinants in Hong Kong, Malaysia and Singapore (Dugar, Ramanan, and Simon, 1995). Industry analysis in a study in Bangladesh differentiated between financial and non-financial companies (Karim and Moizer, 1996). Financial companies within Japan also paid larger audit fees driven by the added complexity of auditing financial companies as well as increased financial regulatory requirements (Naser and Nuseibeh, 2007).

It is more common in economies with dominant industry sectors, where an audit firm has particular specialisation in that industry, that there is a reduced risk to the audit firm. If any, industries such as mining in South Africa would enjoy a reduced audit fee as audit firms have more exposure to this type of business and thus benefit from prior experience and specialisation. Audit programmes from other similar audits as well as prior knowledge from similar audits could be used to create efficiencies on the audit (Willenborg, 2002). "Mining firms paid about 50 percent less in audit fees than comparable firms in other industries" (Simon, 1995).

Measures for increased audit risk take different forms but are all consistent in their significance in determining audit fees. Increased audit risk translates to an increase in the audit fee.

Ownership structure

The extent of ownership also plays a role in that companies who are very widely held will require greater audit coverage than companies which are held by very few owners especially if the majority of the holding is by directors and those

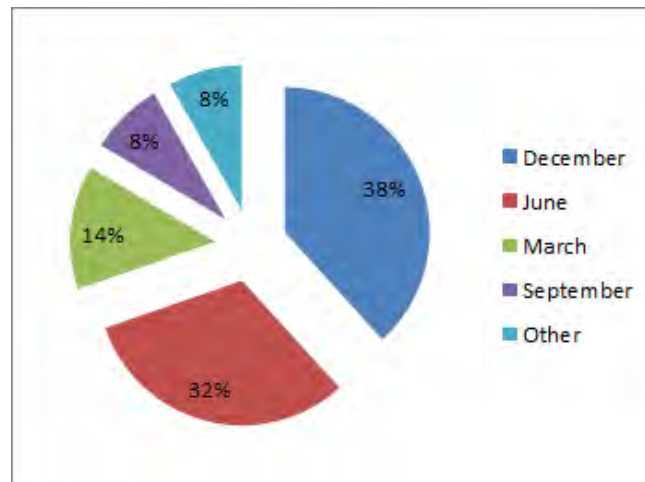
charged with management of the company. Management ownership increases audit risk due to the possibility of management fraud to overstate financial results to manipulate the share price for personal gain. Companies held by foreign entities may require upward reporting and result in further deliverables to be audited by the audit firm. “A wide proxy for ownership control being employed including both directors beneficial and non-beneficial shareholdings and all disclosed shareholdings in excess of five per cent” was employed in one study (Chen et al., 1993).

Audit timing

The timing of the audit also plays an incremental role in the fee. Year-end significance was found in audits performed in the busy period of the Australian market (Craswell, Francis, and Taylor, 1995) which comes at a higher cost.

The busy periods in South Africa, during the months January to March and June to August, see the majority of audit firms being short staffed and working overtime to ensure deadlines are met. An interview with a prominent member of the audit practice of one of the Big 4 within South Africa described the lack of staff during these busy periods as a severe bottleneck on an audit practice but was a necessary commitment to avoid having a larger surplus of staff in the less busy months. Given that the audit trainee body is not contracted-in when needed, an audit firm needs to avoid being overstaffed in the quiet periods. This is to account for the two most common financial year-ends used in South Africa being 31 December and 30 June. Refer to Diagram C below for the breakdown of year-ends as a historical average for the last 5 years 2009-2013. The information used for Diagram C was obtained from McGregor Bfa which provided audit fees for each listed company per year as well as the financial year-end of the company.

Diagram C: Percentage of companies by audit fee broken into financial reporting year-end



Investigation of this variable may prove significant given the dominance of the December and June months and the impact of overtime on the cost of an audit.

A study performed by Zhang and Myrteza (1996) also considered the time taken to complete the audit, measuring the timing difference represented by days between year-end and the date of the auditor signing off the annual report and found this to be a significant variable. This variable sought to model the time spent on the audit as an indicator of audit fees.

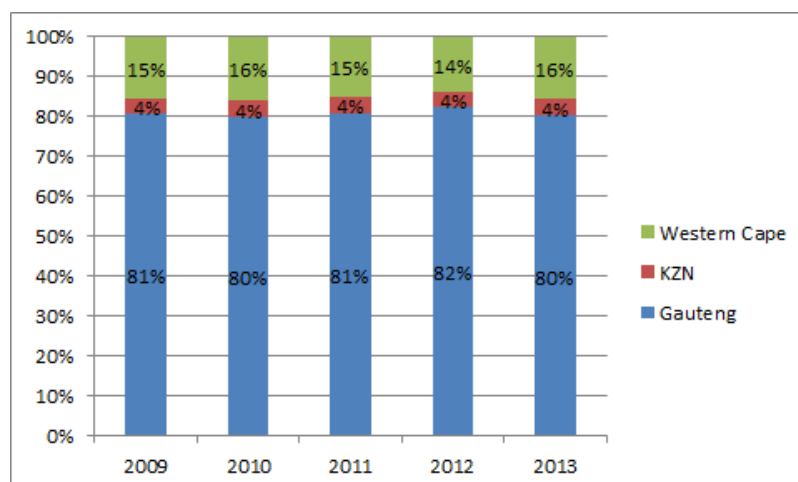
Audit location

Audits taking place in larger cities were found to be at a higher comparative fee than their counterparts in smaller cities within the same country. Both Brinn, Peel and Roberts (1994) and Che Ahmad (1996) found this to be a significant determinant in the United Kingdom.

This does come with the limitation where some of the operations that need to be audited by the audit firm are not in the same city as the administrative headquarters. This cannot be controlled for given the limited information available in an annual report. Refer to Diagram D for the breakdown of audit fees by company headquarters location. The information used for Diagram D was

obtained from McGregor Bfa which provided audit fees for each listed company per year as well as the location of the headquarters of the company.

Diagram D: Breakdown of audit fee per location



Based on the dominance of the Gauteng market and its reputation as the business hub of the country it is possible that audit fees are at a premium here. This may also be the case in the Western Cape.

Audit firm size

Large audit firms tend to have teams with higher qualifications and more focused expertise (Craswell et al., 1995). These firms invest more in their marketing and reputation than their smaller counterparts (Craswell et al., 1995). This calls for a greater audit fee for compensation for these factors. Evidence of a large firm audit premium indicates “product differentiation in the market for audit services” (Simon, 1995). “Higher observed Big 8 audit fees in competitive markets are consistent with positive returns to Big 8 investments in brand name reputation for higher quality audits” (Craswell et al., 1995). Craswell et al (1995) found that the premium on the audit fee was as a result of the brand name development and maintenance as well as the industry specialization of the larger audit firms.

The New Zealand market also showed signs of this in a study, which found a fee premium in relation to the larger firms justified by an improved audit quality

(Johnson, 1995). Another study of the Australian listed market found that the dominant audit firms in the market at the time of his study earned an average premium of 30% (Craswell et al., 1995). The Indian market was also characterized by a large audit firm size (Francis and Simon, 1987). This was once again noted as product differentiation necessitating a higher fee. The French market is characterised by a very statistically significant Big 4 Premium as a result of redundancies caused by their two auditor regime (Choi, Kim, Liu, & Simuni, 2008). In France two audit firms are jointly responsible for the audit resulting in increased cost of performing the audit. In Canada, Anderson and Zeghal (1994) found a large firm premium within the small auditee market which only provides limited support for the significance of the variable.

In contrast to these findings, Malaysia and the Netherlands were not characterized by a large firm audit premium (Langendijk, 1997). The larger local players within the emerging market audit environment explained this. This has the effect of narrowing the differentiation between international and local audit firms. Cultural barriers further explained why the premium is not as prevalent as in the developed economies. "Firms in more secretive cultures are less likely to hire a Big 4 auditor" (Hope, Kang, Thomas, and Yoo, 2008). "Deloitte and Touche fees within Canada were found to be 41% lower relative to other firms within a market with no evidence of a Big 8 audit fee premium (Anderson and Zéghal, 1994). The study by Anderson and Zeghal (1994) was the only one to find a small audit firm fee premium.

An audit performed by one of the Big 4 could therefore come at a premium. "Audit partners interviewed suggested that a premium may exist if they are compared with very small firms but not when compared with medium size firms" (P. Chen et al., 1993). A variable is included to consider who the audit firm is and whether or not they are part of the Big 4. Taffler and Ramalingam (1982) used a variable to capture the effect of a Big 8 auditor in the United Kingdom in their regression model and found this to be a significant determinant. Various studies including the one alluded to earlier by Simunic (1980) have not found this to be a significant determinant. More recently the audit fees of the Big 4 in the United States was

associated “with lower audit fees and higher audit quality” relative to their smaller peers (Kimberly, Mark, & Brian, 2013). This is as a result of efficiencies within Big 4 audit firms as a result of refined methodologies and the increased competition amongst the Big 4. These studies provide mixed evidence across markets regarding a Big 4 audit firm fee premium making investigation thereof valuable to stakeholders involved in the audit value chain.

Change in auditors

“Issues surrounding auditor change have also been of interest. Simon and Francis (1987) incorporated an auditor change variable into their model and found ‘initial engagements to be significantly lower in price than continuing engagements’” (Cobbin, 2002). This was also found in the Australian market where significantly lower audit fees were reported in the year of a change in auditor (Craswell and Francis, 1999). Competition amongst audit firms and the attraction of a lower audit fee explain the existence of this factor.

In a more detailed study Turpen (1990) focused specifically on pricing differentiation on initial engagements and also found significant impact due to auditor change. These studies are in conflict with the results found by Butterworth and Houghton in their 1995 study on the Australian market. The effect may only be as a resultant change from a small to medium size audit firm to a big firm (Butterworth and Houghton, 1995).

Prior studies specific to South Africa

Two studies have been conducted within the South African audit environment focusing on the determination of audit fees. Daniel T. Simon (1995) conducted the first study focusing specifically on the market for audit services in South Africa. His study set out to extend the international literature to a South African context and makes two additional contributions, “an examination of the effects on audit fees of generalized industry experience” and “an analysis of whether the large

audit fee premium is a general phenomenon or is attributable to specific audit firms” (Simon, 1995)

The second study was performed in 2007 and considers the market for audit services in the ‘New’ South Africa (Firer and Swartz, 2007). The study was a replication of the study performed by Simon (1995) but used more recent data post-Apartheid and included multiple years. The reason for the study was due to the ‘new’ South Africa as Firer and Swartz anticipated a change in the findings post-Apartheid. The data used was for financial statements from 2000-2004 which is now outdated.

The data sample used in Simon’s study was from annual reports from 1991 and therefore did not consider differences over time. “Consequently, the conclusions reached by Simon (1995) can only be interpreted specifically for the 1991 year, which is a limitation of the study. The problem of heterogeneity cannot be addressed by the use of a cross-sectional research design” (Gujarati, 2003). Similar to the methodology employed by Firer and Swartz (2007) this study will include data for a more recent five-year period providing more up to date relevant data as well as a trend analysis over time. The use of multiple years in the analysis is termed as panel data for the purposes of statistical analysis, as it is a multi-dimensional analysis. “Panel data also reduce collinearity and provide more informative statistical analysis” (Gujarati, 2009).

At the time of conducting the first study the dominant audit firms were referred to as the ‘Big 6’. The Big 4 is now made up of EY, KPMG, Deloitte and PriceWaterhouseCoopers. In the 2007 study

performed by Firer and Swartz (2007), the Big 4 accounted for 71% of the South African audit fee market and presence of a Big 4 audit firm was a significant determinant. This provided evidence of a large firm audit fee premium. The Big 4 now account for 94% of the audit fee market based on data provided by McGregor BFA.

Simon (1995) found no large firm audit fee premium but a difference was found within the Big 6 with Deloitte and Touche and Ernst and Young earning a premium relative to the other 4 big audit firms. At the time these two firms accounted for 56% of the companies audited by the Big 6 audit firms and 48% of the total market, with the next two biggest firms accounting for a mere 26%.

In contrast to this, Firer and Swartz (2007) found a Big 4 audit fee premium, but did however add “that product differentiation in the audit market in South Africa is related to the reputations of the Big 4 audit firms individually, rather than the reputation of the Big 4 as a group.” Looking for individual firm premiums is thus worthwhile. Two firms still dominate with Deloitte and PWC who in 2013 accounted for 58% of the market. (Refer to Diagram B earlier in this section) This has been relatively unexplored globally and will broaden the existing body of research.

The independent variables used in both studies were total assets of the client, the number of consolidated subsidiaries, the proportion of total assets represented by inventories and accounts receivables and a dichotomous variable for the presence of a Big 6/4 auditor. All variables except for the presence of a Big 6 auditor were found to be significant. As mentioned earlier the Big 4 variable was found to be statistically significant.

This study will update the South African perspective as well as provide a post global financial crisis perspective. One of the significant events during the intermittent period was the occurrence of the global financial crisis. The effects of the global financial crisis are still felt today and have increased the burden placed on regulators and auditors to protect stakeholders. In a study performed at Rowan

University it was found that the “auditors spend more effort and charge higher audit fees to control audit risk during financial crisis” (H. Chen and Zhang, 2012). The expectation is thus that the audit fees will be higher relative to those found in the Firer and Swartz (2007) study as a result of the financial crisis. Furthermore, the increase in audit risk during a financial crisis would result in a greater extent of testing and therefore higher fees. There is also an increase in audit fees in response to the increase in business risk of companies operating in South Africa.

Firer and Swartz (2007) made allowance for a mining variable finding it to be significant at the 10% level but found a negative relationship. Estimated audit fees by the model are therefore lower if the auditee is in the mining industry as opposed to another industry. This finding supported the hypothesis “that if several firms have developed audit specialisation in a single industry, the resulting economies of scale may accrue primarily to clients, leading to a reduction in audit fees” (Firer & Swartz, 2007).

Further inquiry is being made of the implication of audit location and timing. Through the inclusion of other variables, the body of research in the South African context will be extended. Changes taking place in the intermittent period may result in a different relationship to be found between the independent variables and audit fees.

Literature review summary

It is clear from the prior studies that a relationship does exist between audit fees and factors which can be found in annual financial statements of a company. Whilst the factors are not common across all countries the underlying issue is determining the complexity of the audit which relates to both size and nature. The risk of the audit as well as the location and timing were also found to be factors in some jurisdictions.

Within South Africa no large firm audit fee premium has been found but the independent variables of value of assets, number of consolidated subsidiaries and percentage of assets being inventory and accounts receivables all proved statistically significant. A tabular summary of the literature reviewed is provided on the following page.

A summary of selected findings is included below. Studies focusing on specific factors and based on a single geographic location only were chosen for inclusion in the table below. This table is not exhaustive of all research performed on the topic.

Size measures relate to either balance sheet or turnover measures. Complexity measures relate to the number of subsidiaries consolidated within the auditee. The large firm premium relates to whether or not the audit firm was part of the dominant group of auditors at the time. Ticks represent statistically significant variables found, crosses represent the opposite and 'n/a' is used if there was no country study on the measure in the literature review.

*Table E: Summary of selected findings**

| Country | Size measure | Risk measure | Complexity Measure | Large firm premium | Study |
|--------------|--------------|--------------|--------------------|--------------------|--|
| USA | ✓ | ✓ | ✓ | ✓ | (Wallace, 1984) |
| UK | ✓ | n/a | ✓ | ✓ | (M. Taylor & Baker, 1981) (Taffler & Ramalingam, 1982) |
| New Zealand | ✓ | ✓ | ✓ | ✓ | (Johnson, 1995) |
| Norway | ✓ | n/a | n/a | n/a | (Firth, 1997) |
| South Korea | ✗ | n/a | n/a | n/a | (M. H. Taylor & Simon, 1999) |
| China | ✓ | ✓ | n/a | ✓ | (Rose, 1999) (Simon, Teo & Trompeter, 1992) |
| Malaysia | ✓ | ✓ | ✗ | ✗ | (Che-Ahmad, 1996) |
| Australia | ✓ | ✓ | ✓ | ✓ | (Cobbin, 2002) (Francis, 1984) |
| Ireland | ✓ | n/a | ✓ | ✓ | (Cobbin, 2002) |
| Canada | ✓ | ✓ | ✓ | ✗ | (Dugar, Ramanan, & Simon, 1995) |
| South Africa | ✓ | n/a | ✓ | ✗ | (Firer & Swartz, 2007) |
| Netherlands | ✓ | ✓ | ✓ | ✗ | (Langendijk, 1997) |

*Excluded from this table are findings of statistically significant variables in United Kingdom of the impact of audit location (Brinn et al., 1994) and audit timing in Australia (Craswell et al., 1995).

Methodology and data description

Research Questions

The review of the literature indicates that there was a relationship between audit fees and published determinant factors in various countries including South Africa. The research questions are based on the postulate that a relationship does exist between audit fees of listed entities and the aforementioned factors of which this study will focus on:

1. Asset size;
2. Proportion of assets constituted by inventory and accounts receivables;
3. Number of subsidiaries;
4. Presence of a Big 4 audit firm; and
5. Location and timing of the audit.

The research questions for this study are as follows:

1. Can audit fees be explained by a selected set of published determinants?
2. Do location and timing of the audit have an impact on audit fees?

The international literature review has provided evidence supporting these questions. Prior studies of the South African market found evidence supporting a model with statistically significant variables for the determination of audit fees.

The null hypothesis is that there is no relationship between audit fees and the selected determinant variables. If the null hypothesis is rejected, the implication is that there is a statistically significant relationship between audit fees and the selected determinants and that Big 4 audit firms are charging a premium for their services.

Research Process

The studies by Simon (1995) and Firer and Swartz (2007) can be used as a foundation for the approach taken in this study. Both studies had similar research questions and aimed to determine a relationship between a dependent variable, audit fees, and a selected set of independent variables.

The audit fee disclosed in terms of The Companies Act will form the dependent variable of this study. Non-audit service fees will not be included as the non-audit fees can have little relation to the selected set of determinants. Non-audit services can relate to consulting or tax services for special projects being small or large in nature and are therefore unrelated to the determinants used in this study. The inclusion within the audit fee of some companies within the group, which could be dormant, or not as intensive for the purposes of an audit cannot be stripped out from the disclosed fee. This is a limitation in the data.

Linear regression techniques are used to determine the correlation amongst the variables. Linear regression can be defined as an approach for modeling the relationship between a dependent variable, in this case audit fees, and one or more independent variables. "Regression analysis assumes that the values of the dependent variable can be expressed, at least approximately, as a linear function of the values of the independent variables" (Allen, 1997). With the presence of multiple independent variables it is a multiple linear regression model. The construction of this model will run all the independent variables simultaneously as the objective is to model audit fees against all the determinants at once and not independently of each other. This linear regression model is employed to "predict one variable using other variables" and due to its simplicity (Allen, 1997).

The panel data method will be used given that multiple years' data has been obtained. To achieve this a dummy variable will be included in the equation outlined below in the 'Data' section, which will "control for the individuality of each year. The specification of the equation thus allows intercepts to vary over

years” (Firer and Swartz, 2007). Given that the data is for 2009-2013 no dummy variable is inserted for 2009 in order to avoid the dummy variable trap. The dummy variable is numbered 1-4 for years 2010-2013.

The multiple linear regression models will represent the relationship between audit fees and the independent variables. In order to determine if the relationships found by the model are statistically significant a consideration of the coefficient of determination (R squared) will help to determine how well the sample population is replicated by the model indicating if the model is an appropriate fit. These statistical descriptive techniques are explained later. The model and analysis will form the basis for conclusions.

Data

McGregor’s BFA Database ('Expert tool') provides company and financial information on South African JSE listed companies. The database provided data for this study originally extracted by McGregor from the annual financial statements of the listed companies. This allowed for a larger volume of data to be obtained allowing for more statistically significant results. As indicated in the Firer and Swartz (2007) study this deemed the use of questionnaires unnecessary and “eliminates potential problems caused by non-response bias that may exist when data collection depends on responses to surveys.”

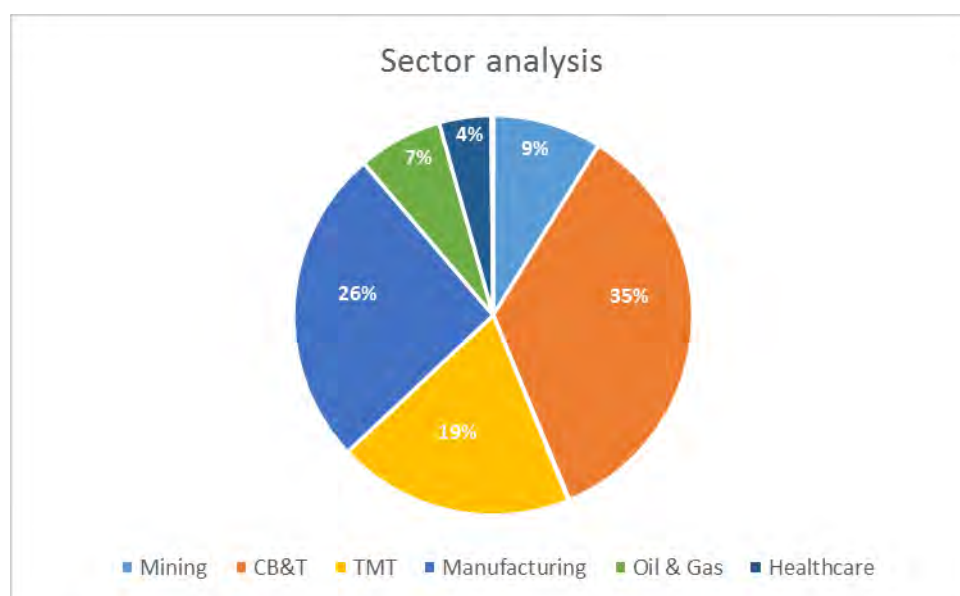
A data search on McGregor Bfa allowed all companies listed on the JSE as at 1 January 2009 to be investigated. The raw data of this study is made up of audit fee data for companies listed on the JSE between the period 2009-2013. 2014 could not be used since not all companies had released their 2014 annual report at the time of this study. Out of this data all non-financial firms were selected leaving 1 116 observations. Similar to the Firer and Swartz (2007) study this is as a result of the finding by Simunic in the 1980 study that the financial services industry has a different fee structure. With financial services making up only 14% of the

market, the remaining sample is still large enough to avoid any bias. The sample size prior to exclusion of financial services companies was 1297 observations. Table F provides certain statistical descriptors of the data sample used within the study.

Table F.1: Selected statistical descriptors of the data.

| | Audit fee R'000 | Total assets (R'000) | Subsidiary number |
|--------------------|-----------------|----------------------|-------------------|
| Mean | 7 024 | 8 898 650 | 18 |
| Median | 2 306 | 1 097 841 | 41 |
| Standard Deviation | 13 457 | 24 427 359 | 25 |
| Observations | 1 116 | 1 116 | 1 116 |

Table F.2: Sector descriptor of the data indicating audit fee market per sector



In light of the detail in the literature review section the dependent variables obtained from McGregor include asset size, proportion of assets being inventory and accounts receivables, number of subsidiaries and audit firm size. The equation below illustrates this.

Equation

$$\text{Audit fee} = \alpha_1 + \alpha_2 \text{asset size} + \alpha_3 \text{invrec} + \alpha_3 \text{subsidiaries} + \alpha_4 \text{big4} + D + \epsilon$$

This equation denotes the relationship of the audit fee to assets, the make-up of assets by inventory and receivables, number of subsidiaries, and the impact of audit firm size. The inclusion of a dummy variable is to allow for the use of panel data and

facilitating a changing relationship over time. The error term represents the residual which the independent variables do not quantify.

The expectation is that there will be a positive correlation between the dependent and independent variables detailed in the former paragraph based on the findings highlighted in the literature review. The magnitude can only be determined through the use of statistical techniques.

After conducting the analysis a separate investigation will be done of a similar nature but including audit location and financial year-end as independent variables to determine if they are statistically significant. They are included separately as this is a secondary research question of this study. By making this a separate model it allows for easy comparison to the results found by Firer and Swartz (2007).

To test for the impact of audit timing a dichotomous factor which determines whether the year-end falls within this period is used. Within South Africa there is more than one busy period given that companies have varying year-ends. The first busy period is from January through March and the second busy period is from July through September. The use of a dichotomous variable is appropriate given the similarity in audit fee revenue in December and June being the busy months as opposed to splitting further between December, June and other months. Refer to diagram C for evidence of this. If the year-end of the audit is June or December the dummy variable will be equal to 1. If not, it will equal to 0.

For the consideration of location a variable will be included in another separate one factor model to indicate whether or not the operations of the auditee are headquartered in Gauteng, Western Cape or elsewhere. It is included separately as this is a secondary research question of this study.

In order to be consistent with prior studies and to account for the high skewedness in the data a natural log transformation was done to the audit fee and asset size to account for this. Number of subsidiaries was adjusted by using the square root of the value. The “resulting equation assumes a proportional relationship between the independent and dependent variables” (Firer and Swartz, 2007). The

statistical descriptors appear improved following this adjustment.

Independent variable selection

All independent variables have been chosen in light of the literature review. Asset value has been selected to provide a proxy for the size of the audit client based on the postulate that a larger client requires greater audit effort as a result of extent and complexity in audit testing required. The portion made up by inventory and accounts receivables is used to further illustrate the complexity of the auditee. Turnover measures were avoided. Whilst this would have avoided issues alluded to earlier it would however only give an indication of size and not complexity of the auditee. The greater the portion relating to inventory and accounts receivables the greater the audit effort required and therefore the higher the audit fee. Asset value is a continuous interval scale variable having order and equal intervals. A positive relationship is anticipated between audit fees and these variables.

The number of subsidiaries of companies within the sample provides a measure for the inherent complexity of the auditee. The assumption is that the higher the number of subsidiaries the higher the complexity of the audit as the operations has to be split into other companies or there is the possibility that these companies are involved in activities outside of the normal operations of the group. More subsidiaries thus imply greater audit effort resulting in increased fees. Number of subsidiaries is a continuous interval scale variable having order and equal intervals.

The Big 4 nominal variable is to investigate the existence of a large firm audit fee premium. It can only take on one of two values being either '0' or '1'. Whilst the prior South African study did not find one, it is deemed appropriate to investigate this again due to the change in the audit landscape. As discussed earlier the Big 4 now account for 95% of the audit market whilst at the time of the Firer and Swartz (2007) study (2000-2004) they only accounted for 71%. The increased market share may have allowed the Big 4 to charge higher audit fees as a result of their increased dominance. "The importance of finding an audit fee premium is that it provides evidence of product differentiation in the market for audit services. That

is, firms that have invested in reputation capital (for example, employee training programmes, firm publications and advertising) may be able to obtain a return on this investment through higher prices for their services” (Firer and Swartz, 2007). For the purposes of this study industry specialisation by audit firms will not be considered as it has been investigated in a prior South African study by Firer and Swartz (2007).

Audits out of companies headquartered in Gauteng are anticipated by this study to be more expensive given the sheer volume of audits of the Gauteng region and given that it is the business hub of the country. Western Cape headquartered audits are anticipated to be more expensive than regions other than Gauteng given the volume of business headquartered in the region. The breakdown of audit per location is provided in Diagram D in the literature review section. The audit location variable is an ordinal categorical variable.

Audits performed during the busy period would be assumed to be more expensive as audit firms are pushed to work more overtime to meet deadlines. The audit-timing variable is a nominal variable having only one of two values being either ‘0’ or ‘1’.

These independent variables have been used in the regression model. The regression findings are discussed in the next section.

Analysis of data and findings

Understanding the statistics

Regression analysis provides output data which provides a means for understanding the regression analysis. In order to appreciate the statistics an understanding of the terminology is required.

“The objective of descriptive statistics is firstly to explore the data and secondly to summarise and describe the observations” (Coakes and Steed, 2003). The mean of a population is defined as the average observed value within the population whilst the standard deviation quantifies the variability of the observed values. The standard deviation is therefore a measure of dispersion. These two together indicate the nature of the dispersion of the population (Allen, 1997). The population is denoted as ‘N’ in the descriptive results tables below. The population consists of 1 116 observations.

The regression results provide reports to examine the effects of the independent variables on the dependent variable. The summary of each model is initially investigated for internal validity. “Internal validity of an experiment is determined by how much control has been achieved in the study; that is, the greater the control achieved, the higher the internal validity” (Firer and Swartz, 2007). The higher the internal validity of the model the more of the dependent variable is explained by the independent variables. The internal validity is indicated by the R-squared value. If R-squared is 75% for example then 25% of the change in the dependent variable is explained by the change in factors other than the independent variables.

The significance of the F-statistic is considered for the explanatory power of the model. “If the level of significance is less than 0.05, the F-statistic will indicate that there is evidence of a linear relationship between variables, and the model can be used for explanatory and predictive purposes” (Firer & Swartz, 2007). Whilst the F-statistic looks at the significance of the model as a whole the t-statistic and probability values (ρ values) look at the significance of the individual

determinants. A positive relationship between the independent variable and the dependent variable is described by a positive ρ value. A negative relationship shows the opposite.

“If the significance level ($\rho < 0.05$) is negative, then there is a negative relationship between audit fees and client size, client complexity, client risk and/or audit firm size. In other words the greater the client size, client complexity, client risk and audit firm size, the smaller the audit fees will be. If $\rho > 0.05$ (significance level), there is no relationship between audit fees and client size, client complexity, client risk and/or audit firm size” (Firer & Swartz, 2007). The central limit theorem was assumed in the analysis. Central limit theorem states that the “distribution of the sum of a large number of independent, identically distributed variables will be approximately normal, regardless of the underlying distribution” (Alabama, 2014). The distribution of the sample set of data is therefore assumed to be normal for the purposes of the t-statistic.

The standardised beta also known as the regression coefficient measures the amount of change in the dependent variable brought about by a one-unit change in the independent variable (Allen, 1997).

Prior to placing reliance on the findings the data was investigated for the presence of multicollinearity. Multicollinearity means that the occurrence of one of the variables within the model is closely correlated to one of the other variables in the model. To consider the presence of this in the data the variable inflation factor (VIF) was calculated and evaluated against the benchmark figure of 10.0, which is an indicator of multicollinearity. All VIF figures were below 10.0 so no evidence of multicollinearity was found (Firer and Swartz, 2007).

Outlining the findings

Research Question 1

The results of the basic equation are set out In Table G and indicate a stronger linear fit in comparison to findings by Firer and Swartz.

Table G: Regression analysis of basic equation

| | | | |
|------------------------------|--------------------------|--------------------|----------------------------------|
| N | 1116 | VIF | 4,93 |
| R Squared | 0,7971 | | |
| Adjusted R Squared | 0,7962 | | |
| F-statistic | 872,11 | | |
| Significance | 0.000* | | |
| | Standardised beta | t-statistic | Significance (p - values) |
| Independent variables | | | |
| Assets* | 0,56 | 44,79 | 0,000 |
| INVREC* | 0,01 | 8,20 | 0,000 |
| Subsidiaries* | 0,09 | 7,29 | 0,000 |
| Big4 | 0,09 | 1,74 | 0,083 |

Dependent variable AUDIT FEE

*Significant at the 0.001 level

Variables with no * are not significant at any level.

The value of the F-statistic is significant at the 0.001 level and the model currently explains 80% of audit fees through the independent variables. This value is higher in comparison to the study by Firer and Swartz (2007) whose model explained 72% of the relationship between audit fees and the same independent variables.

Each independent variable is significant at the 0.05 level aside from the presence of a Big 4 audit fee premium. The findings are somewhat similar to both Firer and Swartz (2007) as well as to other studies from around the world discussed in the literature review section. The big difference between the findings of this study and that of Firer and Swartz is the presence of a Big 4 audit fee premium not being statistically significant in the base equation used for investigation of our primary research question. This is in contrast to the finding by Firer and Swartz (2007). This now provides evidence that the South African market is either no longer or to a lesser extent characterised by a Big 4 audit fee premium.

Research Question 2

The regression was then performed investigating the impact of location of the audit as well as timing of the audit. The results of this test are provided below in Table H.

Table H: Investigating the impact of timing of the audit

| | | | |
|------------------------------|--------------------------|--------------------|----------------------------------|
| N | 1116 | VIF | 4,95 |
| R Squared | 0,7980 | | |
| Adjusted R Squared | 0,7969 | | |
| F-statistic | 730,27 | | |
| Significance | 0.000* | | |
| | Standardised beta | t-statistic | Significance (p - values) |
| Independent variables | | | |
| Assets* | 0,56 | 44,91 | 0,000 |
| INVREC* | 0,01 | 7,75 | 0,000 |
| Subsidiaries* | 0,09 | 7,25 | 0,000 |
| Big4** | 0,11 | 2,03 | 0,043 |
| Busy Period** | -0,10 | -2,25 | 0,024 |

Dependent variable AUDIT FEE

*Significant at the 0.001 level

**Significant at the 0.05 level

Table H indicates the independent variable indicating whether or not the audit occurs during the busy period is statistically significant at the 0.05 level. This is as a result of the significant overtime required during these periods to meet tight deadlines. The overtime is charged at a higher rate than normal time and therefore increases the audit fee. The statistical significance of the variable provides evidence of the strenuous hours worked during the busy periods at audit firms. Timing of the audit is therefore significant in relation to the audit fee.

Table H provides evidence of the Big 4 variable being statistically significant at the 1.5 level. This is as a result of positive confounding. "A cofounding factor is one that is related to both the exposure and the outcome variables and that does not lie on the causal pathway between them. Ignoring confounding when assessing the association between an exposure and an outcome variable can lead to an overestimate or underestimate of the true association between exposure and outcome and can even change the direction of the observed effect" (Silva, 1999). In this table it has overestimated the relationship between the Big 4 audit fee premium and audit fees.

To further answer the secondary research question a regression was performed using the location variables to consider if audits based in certain locations were more expensive than others. A dichotomous variable was included to identify whether the audit was either performed in Gauteng or otherwise, or in Western Cape or otherwise. Table I presents the results of this investigation.

Table I: Investigating the impact of location on audit fee

| | | | |
|------------------------------|--------------------------|--------------------|----------------------------------|
| N | 1116 | VIF | 5,09 |
| R Squared | 0,8036 | | |
| Adjusted R Squared | 0,8015 | | |
| F-statistic | 647,83 | | |
| Significance | 0.000* | | |
| | Standardised beta | t-statistic | Significance (p - values) |
| Independent variables | | | |
| Assets* | 0,56 | 45,83 | 0,000 |
| INVREC* | 0,01 | 8,80 | 0,000 |
| Subsidiaries* | 0,08 | 6,74 | 0,000 |
| Big4** | 0,14 | 2,64 | 0,008 |
| Location : Gauteng** | 0,23 | 3,36 | 0,001 |
| Location : WC | -0,11 | -1,29 | 0,197 |

Dependent variable AUDIT FEE

*Significant at the 0.001 level

**Significant at the 0.01 level

Variables with no * are not significant at any level.

Table I provides no evidence of a statistically significant relationship between audit fee and location within the Western Cape region but does show a statistically significant relationship between audit fees and an audit within the Gauteng region. The standardised beta being positive is consistent with the expectation that an audit within the Gauteng region would be more expensive than other regions as a result of it being the business hub of the country. The location of the audit does therefore play a role in determination of the audit fee.

Being the business hub of the country the province is characterised by a higher cost of living and business. An inland province, it is also affected by costs of transportation from nearby ports for oil and other goods which in turn inflate the costs of other consumer goods. This causes consumer goods within the Gauteng region to be at a higher cost than other provinces. Employees are compensated through higher salaries resulting in services being more expensive within this province.

The Big 4 variable is once again significant due to the impact of positive confounding as a result of the introduction of the two extra variables.

Analysing the findings

The same variables were found to be statistically significant from the Firer and Swartz (2007) study although the model only found a statistically significant relationship between audit fees and the presence of a Big 4 auditor in the presence of either a location based or audit timing variable due to positive confounding. There is therefore a weakened result seen in the ability of the Big 4 to charge a premium to their clients. Reasons for the improvement in the internal validity or R squared of the model and the weakened ability of Big 4 audit firms to charge a premium are the focus area for the ensuing discussion. A first point of consideration is the greater focus on risk based auditing and approaches.

Historically the audit had been focused around coverage being driven by either a balance sheet or income statement approach. As explained before this would require the auditor to audit a certain percentage of a balance ignoring the risk related to it depending on the size of the balance sheet or income statement item.

The extent of auditing was therefore not adjusted given the risk or nature of the item being tested. As described by Chen et al (1993) this was reflective of auditors using a balance sheet approach to their testing. Where auditors used an income statement approach turnover was found to be a more appropriate dependent variable as alluded to in the literature review. The weakness of these audit approaches arose when a balance was made up of a large number of individual similar items and was not responsive to the business or audit risk relating to the item. This would result in the auditor spending time on each individual one testing it to arrive at coverage of the balance.

The introduction of ISA 315 *Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment* initiated a

movement away from this. It was developed in response to business risk auditing (BRA), “BRA differed from earlier methodologies by an initial focus on client business risk (and how this impacts on audit risk) rather than on the financial statements. It was claimed that business risk assessment was a critical component of audit and that anything that increased business risk also increased audit risk. Subsequent to the advent of BRA in the late 1990s, auditing standards were revisited at both international and national UK levels. International Standard on Auditing (ISA) 315 (IAASB, 2003) ‘Understanding the entity and its environment and assessing the risks of material misstatement’ deals explicitly with business risk” (Flint, Fraser, and Hatherly, 2008).

Out of a joint audit risk project between the International Auditing and Assurance Standards Board and the United States Auditing Board the introduction of ISA 315 in 2003 saw the biggest change in recent years to auditing standards. Summarised by the Association of Chartered Certified Accountants ISA 315 requires the following:

- The auditor shall perform risk assessment procedures in order to provide a basis for the identification and assessment of the risks of material misstatement.
- The auditor is required to obtain an understanding of the entity and its environment, including the entity’s internal control systems.
- The auditor shall identify and assess the risks of material misstatement, and determine whether any of the risks identified are, in the auditor’s judgment, significant risks. This is in order to provide a basis for designing and performing further audit procedures.

This facilitated the formal movement towards a risk-based approach. Risk based approaches under the guidance of ISA 315 require an understanding of the auditee to aid in the identification of the risk of material misstatement and determination of which areas of the audit are significant risk areas. The extent of testing is now driven by the risk of the item being tested and is less related to the size of the item being tested. First effective for audits of financial statement for periods beginning on or after 15 December 2004 the Firer and Swartz (2007) study would not have

captured the impact of ISA 315. ISA 315 has been subsequently revised with a new revision effective for audits of financial statement for periods ending on or after 15 December 2013.

The impact of this has been to render the model more reliable as the model is better at quantifying complexity than size. As the audit approach moves closer towards a reflection of complexity the model yields more reliable results. The risk-based audit approach results in a more effective and efficient audit resulting in a reduced audit fee. The strengthening of the explanatory power of the model illustrates this.

A theoretical perspective

A member of academia heading up the audit department of a reputable university in South Africa was presented with the results asked for her commentary. The ensuing discussion is based on the commentary provided from the interview. Both factors increasing audit fees in relation to the independent variables as well as those decreasing them were discussed.

The factors discussed were based on differences between the period when the previous study was performed and this study. Audit approach had changed during this period and a movement towards other audit techniques was driving audit fees down. Given the relationship between hours spent on the audit and the audit fee, the increased utilisation of computerised work programs and working papers increased the efficiency on audits thereby reducing the time spent on the audit as well as the audit fee. "CAAT usage is important since CAATs may increase audit effectiveness and efficiency" (Janvrin, Lowe, and Bierstaker, 2013).

The passing of time also saw the introduction of ISA 610 Using the work of internal auditors in October 2008 by the International Auditing and Assurance Standards Board promoting the utilisation of work performed by this department to be used as audit evidence thereby reducing the extent of testing by the external auditors.

“Specifically, the greater the contribution of the internal auditors to the financial statement audit, the lower the audit fee” (Felix and Gramling, 2001). This further illustrates a move towards complexity of the audit and not

Finally, economic pressures on firms to keep audits added pressure to keep fees to a minimum to avoid losing audits to competitors. This is as a result of commoditisation of audits as well as increased competition amongst firms. “Recent research suggests that auditors may reduce budgeted hours in response to fee pressure despite an increase in client risk” (Bierstaker and Wright, 2001). This is one of the core reasons for the reduced statistical significance of the relationship between audit fees and the presence of a Big 4 auditor.

A practical perspective

For a practical perspective a prominent member of the audit practice of one of the Big 4 within South Africa was interviewed for his perspective on the weakening imminence of the Big 4.

According to the commentator the primary reason is due to the commoditisation of audits. From an auditee’s perspective they merely pay for an audit report at year-end along with limited management commentary and recommendations. There may be exceptions but for the most part the auditor is not adding value to the auditee’s business operations. Clients may just see the audit fee as paying for the opinion and therefore saving on this cost can improve cost cutting efforts especially in the current economic environment as alluded to earlier. The audit commentator did indicate that few firms are willing to pay for the auditor who they believe offers a higher quality product or could provide value added comments after their annual audit.

Whilst audit fees should be determined by the audit committee per section 94 (7)(b) of the Companies Act the commentator described the process of determining audit fees being further driven by management who are more

focused on cost reduction than audit quality. Pricing point has therefore become a more important factor in the selection of the auditor.

Whilst the firm does still make the use of a percentage of turnover for a measure for reasonability of the audit fee, more of the audit fee negotiation is now driven by the prior year audit fee, client pressures and external competition. When a tender is made for a new client a zero based budget is developed considering the risks of the client, location and whether there are any economies of scale. This budget is then compared to the prior year audit fee, which ultimately drives what the current year audit fee is set at. With auditing becoming a commodity, the prior year audit fee has greater importance as increased competition amongst the audit firms are leading firms to compete on audit fees to avoid the risk of losing a client. This echoes what was discussed with the member of academia.

Lowballing amongst the audit firms in terms of audit fee is the easiest way to compete with other firms now as clients no longer decide based on quality. The audit commentator explained how during down periods lowballing audits was an easy way for an audit firm to win clients from other audit firms who were not enjoying the same staff capacity. This has been well researched and investigated globally. "First year independent audits had statistically lower audit fees. Despite the lower fees, quality was higher and more audit hours were utilized" (Deis and Giroux, 1996).

An unrelated issue is the way the audit was being obtained. The audit commentator made reference to historic trends when the audit was agreed during meetings with just a senior in management whereas now the audit tender has to go through supply chain management, which has an increased focus on pricing points. This is especially prevalent in the larger audit clients who place reliance on a procurement department to source tenders for the audit. In the South African Market per the data used in this report the top 10 companies in terms of audit fees accounted for 40% of overall market revenue.

Both discussions provide insight into why there has been a reduction in the Big 4 audit fee premium and point mainly to the commoditisation of audit services.

Concluding remarks

Summary of results

The findings provide evidence that audit fees are driven by size and complexity variables. A positive statistically significant relationship was found between audit fees, asset value, proportion of assets held as inventory and accounts receivables and the number of subsidiaries.

In contrast to prior local research, as well as evidence from other countries previously studied, no evidence was found of a fee premium accruing to large audit firms. The efficiency and benefits of the expertise of the Big 4 accrue primarily to the clients rather than to the audit firms.

The findings also indicated that audits for companies headquartered in Gauteng demand a premium over companies headquartered in other provinces. Timing of the audit had an impact on the audit fee and confirms the expectation of a fee premium during 'busy periods'.

Areas for future research

Given the findings a possibility for future study would be to focus more on quantifying complexity of a client than on size. Further independent variables should be investigated which focus on quantifying complexity by measuring business and audit risk. This will be more appropriate given the change to risk based audit approaches and yield more statistically significant results and can improve the internal validity of the model.

In light of the commentary provided by the market commentator in practice, investigation could also be made into the impact of an incoming audit firm on the audit fee. This could provide further evidence of the increased competition amongst the Big 4 audit firms.

Concluding remarks

The results of the study provide a tool to enable audit firms and clients to make informed decisions regarding audit fees. The predictive prowess of the model has been proven by the regression analysis and can provide an estimate of what the audit fee should be based on the size and complexity of an audit client. Audit firms can utilise the model to aid in audit fee setting whilst clients can use it as a benchmark for evaluating their own fee.

Audit firms can use the tool to justify an audit fee during fee negotiations by illustrating to the client what comparative companies are paying. Audit firms can also use the tool to identify clients where the audit fee is below the market norm based on the regression results and then either attempt to get a greater fee or focus their efforts on other audit engagements.

Auditee's can use the tool to compare their existing audit fee to the one predicted by the model. This would allow them to determine if they are being over charged relative to other companies within the market and provide them with a tool when going into fee discussions with their auditors to back up their concerns over the audit fee.

Larger players within the auditing environment can evaluate the shift in the client perspective and begin moving away from audit services and diversifying further by growing their other divisions. Increasing service revenue from non-audit services by audit firms is therefore increasingly important.

The tool can also be used by academics who can compare results found in the South African market to that abroad or update the study in future years. This paper serves as an expansion onto the existing body of research of the determinants of audit fees.

References

- Alabama, U. of. (2014). The Central Limit Theorem. *Virtual Laboratories*.
- Allen, M. P. (1997). *Understanding regression analysis*. New York: Plenum Press.
- Anderson, T., & Zéghal, D. (1994). The pricing of audit services: Further evidence from the Canadian market. *Accounting and Business Research*, 24(95), 195–207.
- Bierstaker, J., & Wright, A. (2001). The effects of fee pressure and partner pressure on audit planning decisions. *Advances in Accounting*, 18(1), 25–46.
- Brinn, T., Peel, M., & Roberts, R. (1994). Audit fee determinants of independent & subsidiary unquoted companies in the UK—an exploratory study. *The British Accounting Review*, 26(2), 101–121.
- Butterworth, S., & Houghton, K. (1995). Auditor switching: The pricing of audit services. *Journal of Business Finance & Accounting*, 22(3), 323–344.
- Che Ahmad, A. (1996). The pricing of audit services: evidence from the Kuala Lumpur Stock Exchange listed companies. *International Journal of Management Studies*, 4(1), 33–45.
- Chen, H., & Zhang, M. (2012). *Audit Reaction on Financial Crisis*. www.aabri.com. Rowan University.
- Chen, P., Ezzamel, M., & Gwilliam, D. (1993). Determinants of Audit fees for quoted UK companies. *Journal of Business Finance and Accounting*, 20(6), 765–787.
- Choi, J. ., Kim, J. ., Liu, X., & Simuni, D. . (2008). Audit pricing, legal liability regimes, and Big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research*, 25(1), 55–99.
- Chung, D., & Lindsay, W. (1988). The pricing of audit services: The Canadian perspective. *Contemporary Accounting Research*, 5(1), 19–46.
- Coakes, S., & Steed, L. (2003). *SPSS Analysis without Anguish*. *SPSS Analysis without Anguish* (11th ed.). Australia: John Wiley & Sons.
- Cobbin, P. (2002). International dimensions of the audit fee determinants literature. *International Journal of Auditing*, 6(1), 53–77.
- Craswell, A., & Francis, J. (1999). Pricing initial audit engagements: A test of competing theories. *The Accounting Review*, 74(2), 201–216.

- Craswell, A., Francis, J., & Taylor, S. (1995). Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics*, 20(3), 297–322.
- Deis, D., & Giroux, G. (1996). The effect of auditor changes on audit fees, audit hours and audit quality. *Journal of Accounting and Public Policy*, 15(1), 55–76.
- Dugar, A., Ramanan, R., & Simon, D. (1995). A comparative study of the audit services market for public sector versus private sector companies in India. *Advances in International Accounting*, 10, 1–13.
- Felix, W., & Gramling, A. (2001). The Contribution of Internal Audit as a Determinant of External Audit Fees and Factors Influencing This Contribution. *Journal of Accounting Research*, 39(3), 513–534.
- Firer, S., & Swartz, N. (2007). The market for audit services in the “New” South Africa. *Southern African Business Review*, 11(1), 45–64.
- Firth, M. (1997). The Provision of Non-audit Services and the Pricing of Audit Fees. *Contemporary Accounting Research*, 14(2).
- Flint, C., Fraser, I. A. M., & Hatherly, D. J. (2008). Business risk auditing: A regressive evolution?—A research note. *Accounting Forum*, 32(2), 143–147.
- Francis, J. (1984). The effect of audit firm size on audit prices: A Study of the Australian Market. *Journal of Accounting and Economics*, 6, 133–151.
- Francis, J., & Simon, D. (1987). A test of audit pricing in the small-client segment of the US audit market. *The Accounting Review*, 62(1), 145–157.
- Gist, W. E. (1992). Explaining Variability in External Audit Fees. *Accounting and Business Research*, 23(89), 79–84.
- Glover, S., Liljegren, J., Prawitt, D., & Messier, W. (2008). Component materiality for group audits. *Journal of Accountancy*.
- Gujarati, D. (2009). *Basic Econometrics* (Fourth.). United States of America: McGraw-Hill Irwin.
- Haskins, M., & Williams, D. (1988). The association between client factors and audit fees: A comparison by country and by firm. *Accounting and Business Research*, 18(70), 183–190.
- Hay, D., Knechel, W., & Wong, N. (2006). Audit Fees: A Meta-analysis of the Effect of Supply and Demand Attributes. *Contemporary Accounting Research*, 23(1), 141–191.

- Hope, O., Kang, T., Thomas, W., & Yoo, Y. (2008). Culture and auditor choice: A test of the secrecy hypothesis. *Journal of Accounting and Public ...*, 27(5), 357–373.
- International Reporting Standards Board (2003) IAS 2: Inventories [Online]. Available at: <http://www.iasplus.com/en/standards/ias/ias2>.
- International Standard on Auditing 315 (2009) Understanding the entity and its environment and assessing the risks of material misstatement. [Online]. http://www.ifac.org/system/files/downloads/2008_Auditing_Handbook_A100_ISA_315.pdf.
- Janvrin, D. J., Lowe, D. J., & Bierstaker, J. L. (2013). Auditors' usage of Computer Assisted Audit Tools and Techniques: Empirical Evidence from Nigeria. *Research Journal of Applied Sciences, Engineering and Technology*, 6(2), 187–195.
- Johnson, E. (1995). Supplier Concentration and Pricing of Audit Services in New Zealand. *Auditing a Journal of Practice and Theory*, 14(2), 74–89.
- Jubb, C. (1996). Audit fee determinants: the plural nature of risk. *Managerial Auditing Journal*, 11(3), 25–40.
- Karim, A. W., & Moizer, P. (1996). Determinants of audit fees in Bangladesh. *The International Journal of Accounting*, 31(4), 497–509.
- Kimberly, D., Mark, J., & Brian, W. (2013). The impact of market structure on audit price and quality.
- Langendijk, H. (1997). The market for audit services in the Netherlands. *European Accounting Review*, 62(2), 253–264.
- McGregor's BFA Database [Online]. (2014). Retrieved from <http://mcgbfa.com>
- Naser, K., & Nuseibeh, R. (2007). Determinants of audit fees: empirical evidence from an emerging economy. *International Journal of Commerce and Management*, 17(3), 239–254.
- Pong, C., & Whittington, G. (1994). The determinants of audit fees: Some empirical models. *Journal of Business Finance & Accounting*, 21(8), 1071–1095.
- Rao, H., & MacDonald, J. (2011). A study on audit pricing and market assessment of risk. *Academy of Accounting and Financial Studies Journal*, 15(1), 123–134.
- Rose, A. (1999). Audit pricing and the role of multinational factors: A study of the Hong Kong and Malaysian markets. *Advances in International Accounting*, 12, 129–155.
- Silva, I. D. S. (1999). *Cancer Epidemiology: Principles and Methods* (1st ed., p. 305). Lyon: International Agency for Cancer Research.

Simon, D. (1995). The market for audit services in South Africa. *International Journal of Accounting*, 30, 56–65.

Simunic, D. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, 18(1), 161–190.

- Taffler, R., & Ramalinggam, K. (1982). *The determinants of the audit fee in the UK: an exploratory study*. London.
- Taylor, M., & Baker, R. (1981). An Analysis of the External Audit Fee. *Accounting and Business Research*, 12(45), 55–60.
- Turpen, R. (1990). Differential pricing on auditors' initial engagements: further evidence. *Auditing: A Journal of Practice and Theory*, Spring, 60–76.
- Wallace, W. A. (1984). *A time series analysis of the effect of internal audit activities on external audit fees*. (Institute of Internal Auditors Research Foundation, Ed.) (1st ed.).
- Willenborg, M. (2002). Discussion of "Brand Name Audit Pricing, Industry Specialization, and Leadership Premiums post-Big 8 and Big 6 Mergers." *Contemporary Accounting Research*, 19(1), 111–116.
- Zhang, M., & Myrteza, S. (1996). The determinants of audit fees: Australian perspective. *Asian Review of Accounting*, 4(2), 81–97.

Appendix A – JSE list of accredited auditors

The JSE provides a list of accredited auditors who may audit listed companies on the Johannesburg Stock Exchange. The last revision of this listing as of 25 April 2014 was effective 6 January 2014 and can be found at the link at the bottom of this page.

The listing includes the following audit firms listed in alphabetical order:

- AM Smith and Co
- Baker Tilly Greenwoods
- Baker Tilly SVG
- BDO South Africa
- Certified Master Auditors (South Africa) Inc.
- Deloitte and Touche Inc.
- Ernest and Young Isle of Man
- Ernst and Young Inc.
- Foreign Registered firms
- Grant Thornton
- Horwath Leveton Boner
- IAPA
- KPMG
- KPMG Ireland
- KPMG Isle of Man
- KPMG Mauritius
- Logista International Incorporated
- Mahdi Meyer
- Mazars
- Middel and Partners
- Moore Stephens
- Nexia SABandT
- Nkonki Inc

- Nolands Inc
- PKF South Africa
- PriceWaterhouseCoopers
- PwC Namibia
- RSM Betty and Dickson
- Saffery Champness GAT
- SizweNtsalubaGobodo Inc.
- TAG Incorporated
- Tuffias Sandberg KSI
- W Technical Consulting cc

Audit firms highlighted are part of the 'Big 4'

A copy of the listing can be obtained from:

<https://www.jse.co.za/content/JSEContactDetailsItems/Auditors%20and%20their%20Advisors.pdf>