

MICRO ANALYSIS OF AUDIT REVENUE IN NEW ZEALAND

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ABSTRACT

Data analysis enhances the quality of audit. Data analysis also enable auditors to gain better insights, draw better conclusions and ultimately improve the audit process. Audit profession of the late uses more data analysis to improve their audit planning, monitoring and control. Our analysis aims to use such a technique to analyze and visualize financial and audit data of listed companies from New Zealand stock exchange. Our analysis finds that New Zealand audit market has a unique market segmentation favoring the big four firms and the audit market is highly competitive with low auditor turnover. Our analysis find evidence that big four firms charge premium for their services in New Zealand. Compliance costs increase the audit and non-audit services fee and we find evidence in our analysis that the adoption of International Financial Reporting Standards (IFRS) increases both the audit and non-audit services fee in the year 2007 and 2008. Other interesting findings suggest that city of the auditor office is important and industry specialization of the audit firm determine their revenue share in some the industries.

JEL: M42, M48, M49

KEYWORDS: New Zealand, Audit Fees, SOX, IFRS

INTRODUCTION

Massive volumes of data are now available both internally and externally and the power of new data analytics bound to change the audit environment. Audit profession has long recognized the impact of data analysis on enhancing the quality and relevance of the audit but use of this technique has been hindered due to a lack of efficient technology solutions, issues with data capture and privacy concerns. However, recent technology advancements in big data and analytics provide ample scope to rethink the way in which an audit is executed. Big data and analytics are enabling auditors to better identify financial reporting, fraud and operational business risks and tailor their approach to deliver a more relevant audit (Roshan 2015). Our aim is to micro analyze the big data and investigate the audit market and its peculiarities in New Zealand. We mainly focus on the micro analysis of audit and non-audit services fee in New Zealand and the aim is to find patterns that are not reported at large. New Zealand is geographically and economically small country and has a saturated audit market with very low litigation. There is a low incidence of auditor turnover in New Zealand (3 percent over a nine-year period), and there is some evidence of competitive pressures to retain existing clients and regain lost clients (Sharma et al. 2011). Hay and Knechel (2010) conclude that competitive fee cutting as a client solicitation and retention strategy is not uncommon in New Zealand. Most of the earlier literature (e.g., Hay et al. 2006) explore the factors that affect audit pricing with hypotheses.

Our analysis does not hypothesize any specific effect of factors in audit pricing but attempts to show some of the facts which most of the earlier studies found but did not report in detail. Analyzing a sample of 1078 firm-years over a period of 2004 to 2016, we find that the New Zealand audit market like other countries like U.S. is dominated by the big four firms and even among the big four firms there is segmentation. Ever

since the introduction of governance codes mimicking SOX in the year 2004 and International Financial Reporting Standards (IFRS) in the year 2007, the audit and non-audit revenue shows mixed growth. The city of Auckland, being the commercial hub, houses most of the audit offices. Media industry on an average pays top dollars to the audit firms while the food industry pays the least. We discuss the literature review in the next section, followed by sample selection and methodology, results and discussion and the final section concludes the analysis.

LITERATURE REVIEW

Earlier audit literature starting from Simunic (1980) investigated the determinants of audit fee to price setting arrangement in a market setting. DeAngelo (1981) and Watts and Zimmerman (1983) used agency theory to explain the audit fee determination. Francis et al. (2005) observed that audit firms are aware of high litigation risk and they put in more hours of work in order to maintain audit quality. Rama and Read (2006) opine that regulatory changes (e.g., SOX, adoption of IFRS) on compulsory auditor rotation and auditor tenure may increase auditor's workload and audit risk and it is difficult to find audit partners with the desired skills to replace the lead partners. In such a case, the audit firm must increase the fee to compensate for more risk exposure. The introduction of corporate governance codes has further increased the workload of the auditors. Auditors now evaluate their audit risk by looking at various factors like board independence, audit committee independence, audit committee expertise, duality etc (e.g. Carcello et al. 2002; Abbott et al. 2003; Vafeas and Waagelein 2007; Sharma et al. 2011).

Audit literature cites a host of factors that impact audit pricing and most of the researchers have verified the authenticity of such claims. Hay et al. 2006 listed the most commonly used variables in most of the studies and opined that some of the variables like total assets (indicating size of the firm) show consistent results but several of them show no clear pattern in certain periods or countries. Studies (e.g. Simunic 1980) conducted in the U.S., used more control variables. The size of the firm, complexity of the audit and the risk associated with the audit mainly determine the audit price. Copley et al. (1995) show that Big8 firms charge higher fees. Hamilton et al. (2008) observe that BIG4 concentration is low in the small client market and high in the large client market in both 2000 and 2003 in Australian audit market.

The audit firms are likely to charge more audit fees when the firm is large, the audit is complex, and audit risk is higher (e.g., Kannan et al. 2014; Hay et al. 2006). The industry of the firm is another important factor in the determination of audit fees. Certain industries (e.g., mining, banking) need special audit work because of their nature. Taylor (2000) observes that these industries have different accounting policies regarding among other things, recognition of revenue and expense, and valuation of assets. Identifying significant audit areas, and inspection and observations of records need distinct skills. The audits of firms in such an industry call for specialized knowledge of the industry and the firms that possess the knowledge earn more revenue than others in that industry. Sharma et al. (2011) opine that client importance could compromise the performance of the audit in a small economy like New Zealand. They also observe that audit firms in New Zealand have engaged in fee-cutting behavior to regain lost clients, and non-audit fee revenues on a per client basis at the city office level comprise a more significant portion of the office revenues compared to larger economies such as the U.S. Corporate governance, chief executive officer's compensation do affect audit pricing (e.g., Kannan et al. 2014, Ananthanarayanan et al. 2017). Our aim is to bridge this gap and investigate the audit market patterns in New Zealand. The results of the U.S. studies cannot be generalized to N.Z. or many other countries primarily because of differences in the size and nature of the economy. N.Z. institutional, accounting, and auditing environments are different from the U.S. in many ways, including lower corporate and auditor litigation risk, smaller size and volume of capital markets (equity and debt), smaller size of firms, and less developed and voluntary nature of governance regulations (Sharma et al. 2011; Davis and Hay, 2012).

DATA AND METHODOLOGY

Our sample is selected from the population of firms listed on the New Zealand Stock Exchange (NZX) from fiscal years 2004 to 2016. The financial data for all companies are obtained from the Global Vantage Database. Data for audit fees are taken from the annual reports filed with the NZX. The initial sample yields 2,412 firm-years. We exclude 612 firm-years due to data unavailability for minimum nine years. To avoid the effect of foreign audit and corporate regulations, we exclude 657 firm-years that are dual listed on the NZX. We then exclude 65 firm-years due to less than five observations per industry as we need sufficient industry samples to measure audit fees. Thus, our overall sample consists of a balanced panel of 1078 firm-years (2004-2016). Table 1 summarizes our sample selection procedure. Table 1B summarizes the share of major audit firms in the New Zealand audit market. It is evident that PWC has the greatest number of audits and together with KPMG they have 65% share of the market. Ananthanarayanan et al. (2017) observed that the audit service suppliers of New Zealand listed companies are split into three groups, PWC and KPMG, Deloitte and Ernst & Young, and the non-big four and our analysis confirms their findings. The dominance of PWC is due to the fact that it is the first big four firm to start operating under its own name in New Zealand (*circa* 1930). We specify and estimate our OLS regression fee models based on prior audit fee research (e.g., Kannan et al. 2014; Hay and Knechel, 2010) to test the effect of *AUDFEE* on the big four firms and industry. We use limited control variables because our main focus is to study the effect of audit firms and industry on audit fees

$$AUDFEE = \beta_0 + \beta_1 BIGFOUR + \beta_2 INDS + \beta_3 Controls + \varepsilon \tag{1}$$

Where:

- Audfee = Defined as the Natural Log of Audit Fees
- BIGFOUR = 1 if the client's external auditor is a Big 4 auditor, 0 otherwise
- INDS = industry of the client firms

Control Variables

- SIZE = natural logarithm of firm's total assets
- GEOSEG = number of firm's geographic segments
- BUSSEG = number of firm's business segments
- ARINV = sum of accounts receivable and inventory scaled by total assets
- MB = firm's market price per share to book value per share ratio
- LEVERAGE = total long-term debt scaled by total assets
- MERGER = 1 if the firm had a merger or an acquisition during the year, 0 otherwise
- NAS = natural logarithm of total non-audit fees paid by the firm to the auditor
- YEAR = Year fixed effects indicator variable

Table 1: Sample Construction

Firms Listed on the New Zealand Stock Exchange From 2004 To 2016	2,412
Less: Dual-listed firms	(657)
Less: Firms with incomplete data (less than 9 years data)	(612)
Less: Firms with less than five observations in the industry	(65)
Final Sample (firm-years)	1078

This table shows data selection of firms listed in the New Zealand stock exchange from 2004 to 2016.

Table 1B: Distribution of Audit Firm share of the Audit Market

Names	Firms Audited	Percentage
PWC	414	38.40%
KPMG	286	26.53%
Deloitte	148	13.73%
Ernst & Young	85	7.88%
Grant	27	2.50%
BDO	21	1.95%
Others	97	9.00%
Total	1078	100%

This table shows audit market share audit firms in New Zealand from 2004 to 2016. Others include all other ten audit firms whose share is insignificant in the audit market.

RESULTS AND DISCUSSION

We discuss the results of our three-main analysis namely audit fees, audit fees by auditors, and audit fees by industries. It is quite possible to add further micro analysis based on the earlier audit literature (Hay et al. 2006).

Audit Fees

Table 2 show mean audit fees (actual and relative) in New Zealand between 2004 and 2016. We evaluate the level of audit fees per auditee and scaled by total assets (proxy for size of the firm) to understand the trend of audit fees in the post-SOX era. The audit fee shows a steady increase over the years 2004 to 2011 and declines marginally from 2012. One of the reasons is that the number of listed companies with more than nine-year data is on the decline due to takeovers, mergers and delisting from the NZX after 2012. Non-audit service fees show a declining trend in the years 2004 to 2007 but increases in 2008 (Figure 1a and 1b). Earlier studies (Griffin et al. 2008; Kannan et al. 2014) have documented such an increase in the audit fee, decrease in the non-audit service fee, and attribute this to the implementation of SOX, and in New Zealand, Griffin et al. (2008) document an increase in audit fees and opine that the adoption of NZ IFRS, rather than overseas governance reforms, is the main cause of the increase. The non-audit service fees increase in 2008-2009 could also be due to implementation of IFRS.

There are no severe restrictions on non-audit services to be provided by audit firms in New Zealand, but the growth of non-audit fees is relatively low as compared to audit fees growth. It is quite possible that New Zealand firms, being relatively small, do not require rigorous audits and extensive non-audit services. The decrease in non-audit service fees could be due to the adoption of corporate governance principles and practices in New Zealand, which mimic SOX but our analysis excludes governance variables. Comparatively the growth of audit fees in the later years could be attributed to the introduction of corporate governance principles. Firms now demand an increased audit effort from audit firms to minimise the risk of poor financial reporting and its after effects. Studies conducted in the U.S. (e.g., Vafeas and Waegelian 2007) on audit fees strongly support such views. Another important development is the establishment of the Financial Markets Authority (FMA), an agency with a critical role in regulating capital markets and financial services in New Zealand since 2011. Prior to that multiple agencies were responsible to monitor different aspects of financial reporting, accounting and auditing standards.

Table 2: Average Audit and NAS Fees (in NZ Dollars)

Years	AUDFEE	NAS	AUDFEETA	NASTA
2004	209,735	128,940	0.0030	0.0009
2005	246,716	121,408	0.0026	0.0005
2006	301,238	101,721	0.0022	0.0007
2007	322,323	89,616	0.0024	0.0006
2008	343,432	120,312	0.0029	0.0005
2009	385,873	71,449	0.0023	0.0016
2010	386,150	62,087	0.0025	0.0012
2011	391,553	56,637	0.0025	0.0011
2012	376,795	68,717	0.0026	0.0010
2013	387,122	99,762	0.0020	0.0003
2014	347,757	91,523	0.0017	0.0004
2015	348,717	88,686	0.0018	0.0003
2016	361,161	90,970	0.0016	0.0003

This Table Shows Audit Fees (AUDFEE), Non-Audit Services Fee (NAS), AUDFEETA (Audit Fees Scaled by Total Assets of a Firm), And NASTA (Non-Audit Services Fee Scaled By Total Asset) In New Zealand 2004 To 2016.

Table 2 show that average audit fees steadily increase from 2004 to 2011, and non-audit service fees decline in the years 2005 to 2007 but increase in 2008-2009 falling again in 2010. Table 2, and Figure 1b shows that, as a proportion of total assets, audit fees increase slowly between 2005 and 2008 but declines in 2009 and fluctuate thereafter. Non-audit service fees, as a proportion of total assets, decline in 2005, but raise to the maximum in 2009 and decreases in the following years. Increase in audit fees could be due to the implementation of the IFRS, which became compulsory from 2007 onwards in New Zealand. There is no visible evidence of SOX having an effect in New Zealand. However, it is possible that there is a ripple effect of SOX, since its implementation from 2004.

Audit Fees by Auditors

Table 3: Audit and NAS Fees

Panel A: Average AUDIT and NAS Fees Earned by Audit Firms Nation-Wise (in NZ Dollars)				
Names of Audit firms	AUDFEE	NAS	AUDFEETA	NASTA
BDO	68,282	8,227	0.0045	0.0001
Deloitte	232,461	89,437	0.0022	0.0013
Ernst & Young	389,317	116,475	0.003	0.0002
Grant	186,815	30,259	0.003	0.0008
KPMG	423,324	120,658	0.0018	0.0005
PWC	401,989	94,690	0.0018	0.0006
Panel B: Audit and NAS Fees of BIGFOUR and Non-BIGFOUR Firms (in New Zealand Dollars)				
Auditor Name	AUDFEE	NAS	AUDFEETA	NASTA
BIGFOUR	379,576	103,547	0.002	0.0006
BDO & GRANT	133,596	20,367	0.0036	0.0005

Panel A shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) earned by the major firms over the years 2004 to 2016. Panel B shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) earned by the big four and non-big four firms over the years 2004 to 2016.

Auditor dominance is another issue that has been pointed out in the literature (Hay et al.2006). To test this contention this analysis observes and records the current state of audit fees in the New Zealand audit market by individual audit firms. Our analysis accounts only for the major non- BIGFOUR firms BDO and Grant Thornton (hereinafter Grant). As per Table 3, Panel A, on an average, KPMG charges more audit and non-audit service fees than the other BIG4 and non-BIG4 audit firms. Of the BIGFOUR firms, Ernst & Young

on average charges lower audit and non-audit service fees. On average, the BIGFOUR audit firms charge more audit fees and non-audit service fees than the non-BIG4 audit firms. Table 3, Panel A also shows as a proportion of total assets, Binder Dijker Otte (BDO) charges higher audit fees than all other firms. PricewaterhouseCoopers (PWC) and Klynveld Peat Marwick Goerdeler (KPMG) charges the least amount of average audit fees scaled by total assets. Deloitte charges more non-audit service fees per dollar of total assets than all other audit firms. Table 3, Panel B shows that the BIGFOUR firms earn more fee revenue than non- big four firms because they audit 87% of the audit firms. Our analysis accounts only for the major non- big four firms BDO and GRANT (Grant Thornton) as other firms cover insignificant portion of the total audit market in New Zealand. On the other hand, non-big four firms charge a higher relative audit fee than the big four.

Audit Fee by Industry and Office Location

Table 4: Industry-Wise Audit and NAS Fees (in New Zealand Dollars)

Name of Industry and (%) Share	AUDFEE	NAS	AUDFEETA	NASTA
Agriculture & Fishing (10%)	229,391	77,497	0.0020	0.0004
Food (5%)	97,774	31,885	0.0049	0.0004
Intermediate & Durables (20%)	404,280	92,274	0.0018	0.0003
Property (10%)	534,253	137,839	0.0004	0.0001
Ports (9%)	357,133	148,353	0.0006	0.0002
Leisure & Tourism (6%)	485,737	290,018	0.0021	0.0018
Consumer (21%)	178,544	40,697	0.0022	0.0007
Media & Communications (6%)	766,688	57,684	0.0034	0.0009
Health services (6%)	426,033	79,623	0.0037	0.0008
Bio Technology (7%)	83,634	48,392	0.0062	0.0035

This table shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) in each industry over the years 2004 to 2016.

Industries having different needs and different levels of audit risk lead to different levels of audit fees. Table 4 shows that on average, the media industry pays higher average audit fees than any of the other industries, the leisure industry pays higher amounts of non-audit service fees than other industries, and the food industry pays the least amount of audit and non-audit service fees. The biotechnology industry pays more audit and non-audit service fees per dollar of total assets whereas property industries pay the least audit and non-audit service fees per dollar of total assets.

Table 5 City-wise Audit and NAS fees (in New Zealand dollars)

Name and (%) share) of City Audit Office	AUDFEE	NAS	AUDFEETA	NASTA
Auckland (64%)	442,784	118,075	0.0023	0.0007
Christchurch (9%)	128,732	27,287	0.0026	0.0001
Dunedin (6%)	108,632	24,278	0.0025	0.0016
Hamilton (1%)	118,692	64,385	0.0005	0.0004
Lyttleton (1%)	69,222	52,556	0.0003	0.0003
Tauranga (5%)	166,058	99,854	0.0007	0.0004
Wellington (14%)	180,871	39,385	0.0029	0.0005

This table shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) by audit firm's audit offices in various cities of New Zealand over the years 2004 to 2016.

Table 5 shows that on average audit offices in Auckland earn higher revenue in audit and non-audit services fee as Auckland accounts for 64% of the total audit market. Wellington and Christchurch accounts for 14%, and 9% of the audit market respectively. Wellington offices earn higher audit and non-audit services fee per dollar of total assets. Our finding is similar to the observations made by Sharma et al. 2011. In

untabulated analysis, we observe that PWC audit firm earns a higher average audit fees and non-audit fees in agriculture, leisure & tourism, consumer, media, health services, and bio technology industries whereas KPMG earns higher average audit and non-audit services fee in property, and intermediate industries. Deloitte earns higher average audit and non-audit services fee in ports and food industries.

Regression Results

In Table 6, the coefficients on *BIGFOUR* is positive and significant ($p < 0.01$) suggesting that *BIGFOUR* firms earn a higher audit fees than the non-big four firms. This result is consistent with earlier findings of audit studies (e.g. Simunic 1980; Hay et al. 2006). On the other hand, the coefficients on each industry has its own positive or negative effects on audit fees. The coefficients on *FOOD*, *PROPERTY*, *PORTS* and *TRANSPORT*, and *HEALTH SERVICES* are positive ($p < 0.05$, $p < 0.01$) and significant indicating that these industries pay higher audit fees to the audit firms due to higher risk and litigation factors. The coefficients on *INTERMEDIATE AND DURABLES* is negative but significant ($p < 0.10$) suggesting that they pay less audit fee than others due to comparatively lower risks than other industries. The coefficients on all other industries are not significant indicating lack of association with audit fees. The results are consistent with earlier studies (Hay et al. 2006, Sharma et al. 2011) conducted in New Zealand. All our other control variables results are consistent with the results of earlier studies (Sharma et al. 2011; Davis and Hay, 2012)

In untabulated results (due to brevity), we also run another regression based on *AUDFEENY* (audit fees of next year) and find the results similar to results reported in Table 6. We also run year wise regressions on our regression model 1 (results not tabulated) and find that years 2005, 2008, 2009 and 2012 are positive and significant with audit fee suggesting that IFRS adoption could be the reason for the years 2005 (earlier adoption by some companies) and in 2008 and 2009. An interesting point here is that after 2012 the number of companies listed in NZX with complete data has reduced considerably due to mergers and takeover. We also run tests on reduced sample size (845 firm-years) and find that our results are consistent with the main sample

Table 6: Regressions of Audit Fees on Industry and Big Four Firms (Dependent Variable = *AUDFEE*)

Variable (Predicted Sign)	Coefficients	t Value
Intercept	1.928	8.622***
Bigfour (+)	0.112	2.814***
Agriculture and fishing	-0.064	-1.463
Food	0.0950	2.505**
Intermediate and durables	-0.087	-1.648*
Property	0.149	3.344***
Ports and transport	0.138	3.172***
Leisure and tourism	-0.040	-1.046
Consumer	-0.056	-1.042
Media and communications	0.048	1.235
Health services	0.127	3.073***
Bio technology	-0.064	-1.463
Year	YES	YES
Controls	YES	YES
F value	124.875***	
Adjusted R-square	0.712	
N	1078	

This table shows the regression results of audit fees on industry and Big four firms in New Zealand from 2004 to 2016. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Directional tests are one-tailed, otherwise two-tailed. Due to brevity we have not shown the individual controls results and year effects.

CONCLUSION

The aim of our paper is to use data analysis of listed companies of New Zealand stock exchange from the year 2004 to 2016 to find patterns in the audit fee market. Our overall sample consists of a balanced panel

of 1078 firm-years (2004-2016). We test the association of audit fees with big-four firms and various industries using a regression model. Our audit market analysis clearly shows the existence of audit market segmentation in New Zealand and the larger share of big four firms. Auditor turnover is very low in New Zealand and audit firms audit and non-audit revenue shows a mixed growth. It is to be noted that regulatory compliance pushes the audit cost which is evident in the year 2007 -2009. Our regression results indicate that big four firms earn higher audit fees than non-big four firms. Some of the industries pay higher audit fees due to higher risks while less risky industries pay lower audit fees. Adoption of IFRS in the year 2007 to 2009 increased the audit and non-audit services fee as regulatory changes increase the compliance requirements of firms. Audit market in every country exhibit certain patterns which may be relevant in other countries and in some periods. Our findings confirmed certain findings of earlier researchers.

Our analysis has certain limitations. First, we analyze limited areas like general audit fees, audit fees of firms, city office revenues, and industry-wise revenues. Second, the sample size may look very small compared to research and analysis in the U.S., and the findings of the report are applicable only to NZX listed firms during the period 2004 to 2016 and no other firms of New Zealand in general. Third, our sample estimation requires minimum of nine-year listing in NZX. Due to mergers and takeovers, the number of listed firms in NZX is reduced after year 2012 and there may be some distortion in the data but our sensitivity tests considering all the 65 unique firms that has all the thirteen-year financial records show consistent results like our main sample. Fourth, our regression did not consider governance variables as our main focus is to analyze mostly audit firm and industry effects on audit fees. Micro analysis of other factors that impact audit fee like accounts receivable and inventory, business and geographical segments, merger and acquisition, executive compensation and corporate governance measures could be explored in future analysis. Future studies should also include corporate governance and other variables in their regression analysis to determine their effect on audit fees.

DATA AVAILABILITY

All Data Are Publicly Available from Sources Identified in the Text.

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