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An Exploratory Study Regarding the Effects of Auditor Switch, Auditee's Industry, and Auditee's Location on Audit Fees in Australia

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***Abstract*—**This study examines the effects of auditor switch, auditee's industry, and auditee's location on audit fees in Australia. It uses fee data of Australian Securities Exchange 500 companies, considering all industry classifications throughout the country from 2006 until 2016. Main findings show that auditor switch does not affect audit fees. However, auditee's industry affects audit fees. This effect occurs in information technology, financials, energy, and materials sectors among the top 500 companies. Financials, energy, and materials sectors face a fee rise, whereas information technology has a fee cut. The extent of fee changes is different among various industries, wherein the financial sector has the highest increase. Further, auditee's location affects audit fees. Top 500 companies in Hobart, Perth, and Brisbane face a fee reduction, wherein the highest cut is in Hobart. Further analysis suggests that the Australian audit market is being increasingly concentrated in the hands of the Big Four audit firms.

***Keywords*—**Audit fee, auditor switch, Australia, industry, location.

I. Introduction

We examine the effects of auditor switch, client industry, and audit market location on audit fees in Australia. When an auditee (client) firm replaces its incumbent auditor with another auditor, this event is known as an auditor switch [1]. Auditor switch is not uncommon in Australia and other countries. For example, there were 282 instances of auditor switch among the Australian Securities Exchange (ASX) 500 firms since 2006 until 2016, suggesting that roughly 5% of the top 500 firms switched their auditor in a given year. Various factors may motivate an auditor switch [2]. Regulatory intervention due to misconduct, opinion shopping, management turnover, and an attempt to match a company's requirements with its auditor's specialisation are some of the reasons for auditor switch [3]-[5]. An auditor switch can have different consequences [4]. For example, it may have an effect on audit opinion [6], pricing of initial audits [7], earnings quality [8], and stock market reactions [9], [10].

Although there have been early audit pricing research in Australia [11]-[14], whether auditor switch has any influence on audit fees needs to be revisited given significant corporate governance initiatives following these early studies. Specifically, corporate failures of the last decade initiated regulatory changes in Australia [15]. For example, the Australian Parliament enacted the Corporate Law Economic Reform Programme 9 (CLERP 9) in July 2004, requiring mandatory rotation of both the lead engagement and audit review partners after every five years [16]. Moreover, CLERP 9 requires disclosure of non-audit fees in financial reports [17]. It mandates the top 500 listed firms to establish an audit committee [18]. The Act requires that at least one audit committee member be financially literate [18]. Further, it mandates the audit committee to participate in the selection and remuneration of auditors. These requirements can change the dynamics of audit fee negotiations. Moreover, there has been an increased attention on corporate governance and boards' monitoring roles since the global financial crisis [19]-[23]. For example, Principle 2 of the ASX Good Corporate Governance and Best Practice Recommendations requires public listed companies to establish an effective board of directors [24]. Specifically, it requires the top 500 listed companies to establish an audit committee and disclose their process regarding their engagement partner's rotation, appointment, and removal of their auditors [25].

We investigate the association between audit fees and a client's industry membership because an auditee's characteristics can influence its audit fees and its industry membership can shape its firm-level characteristics. Specifically, different industries have different audit risks [26]. Risk leads to more audit efforts [27]-[29] and affect audit fees [30]. Further, some clients such as manufacturing companies [14], [31] may require a higher level of expertise from their auditors and pay them higher fees [32]. Similarly, a client's location is a part of its audit market dynamics and its audit costs. For an auditor, location affects audit fees as employee costs are different in different locations. Thus, industry [33] and audit market location [34] can affect audit fees. Australia is a geographically vast and diverse country. Because of their geographical distances (e.g. the distance between Sydney and Perth), the Australian audit market might be segmented at the city level. However, previous Australian audit studies do not examine this relationship at all. Hence, this study also evaluates the effect of audit market location on audit fees.

We conduct multi-variate analysis of audit fees data of the ASX top 500 companies, considering all industry classifications from 2006 to 2016. Our key results suggest that auditor switch does not significantly affect audit fees. However, a client's industry membership affects them. This effect occurs in information technology, financials, energy, and materials sectors. Financials, energy, and materials sectors

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face a fee rise, whereas information technology sector has a fee cut. The extent of fee changes varies across industries while the financials sector has the highest increase. Moreover, location affects audit fees. The ASX top 500 firms in Hobart, Perth, and Brisbane face reduced audit fees; especially, firms located at Hobart experience the lowest audit fees among all capital cities.

Our study contributes to the audit fees literature in Australia in three ways. First, we provide recent evidence on the price efficiency of the audit market in Australia. Our results suggest auditor switch does not lead to a significant price reduction in the initial audit engagement. To the extent audit fees reflect audit quality [35], [36], our results are likely to enhance users' confidence in the audit reports in Australia. Second, we provide recent evidence of geographic and industry segmentation of the Australian audit market. Specifically, auditees located in Hobart, Perth, and Brisbane pay significantly lower audit fees and clients in the financials, energy, and materials sectors pay significantly higher audit fees. Third, we provide recent evidence that the Australian audit market is increasingly being concentrated in the hands of the Big Fours with more firms switching from non-Big Fours to Big Fours. Such concentration of the audit market could be the result of several factors, including increased audit complexity over time, demand for higher audit quality over time, and competitive advantages of the Big Four auditors over non-Big Fours.

II. Auditor Switch and Theories of Audit Pricing

A. Auditor Switch

An established body of literature exists that documents the causes and consequences of auditor switch. However, a detailed treatment of this literature is beyond the scope of this paper. The key drivers of auditor switch that are documented in the literature include, inter alia, qualified audit opinion [37]-[39], audit quality [40], management change [41], client size [2], [41], and financial distress [42], [43].

Auditor characteristics also can cause an auditor switch [44]. For example, an auditor's market share may affect its switch decisions [45]. An auditee of non-Big Four auditors may prefer to hire a Big Four auditor after a merger if it can benefit from the Big Four's specialisation [46]. Moreover, audit team characteristics [44], the existence of significant foreign operations [47], and auditor's geographical distance [48] are other auditor characteristics that may influence a switch decision. Haskins and Williams [49] find an auditor's fees level as the most important factor that may affect its switch decisions. Similarly, an auditee's characteristics may cause a switch [50]. Clients may use their auditor choice to signal their position [51]. Those with desirable information may pay more to obtain a high-quality auditor, aiming to signal their performance level to investors [52]. However, auditees with less favourable information may choose a lower-quality auditor [51]. Other client characteristics that may bring an auditor switch are management changes [50], management's attitude toward audit fees [53], [54], firm growth [52], and financial distress [43], [55]. Moreover, new managers may decide to switch so they have a better working relation [56] or a personal connection [44] with their auditor. Further, they may desire an audit firm that quickly accepts their accounting proposals [43].

Overall, an auditor switch can be initiated by an audit firm or its client and for various reasons. The auditor and its client characteristics are some of the drivers of the switch.

B. Theories of Audit Pricing

DeAngelo [57] and Dye [58] provide two opposing audit pricing theories. DeAngelo [57] supposes that the initial fee is discounting in every setting. DeAngelo suggests that transaction costs result in initial price discounting, as they provide a cost advantage to the incumbent auditor. Subsequently, the incumbent can gain by charging above the avoidable costs in future periods [57]. DeAngelo views initial discounts as sunk costs that cannot impair auditor independence in the coming years. DeAngelo assumes that initial and recurring audit costs are precise, equal, and known to all auditors. Likewise, switching costs are particular, uniform, and recognised to all clients. Several later studies support for DeAngelo [57]'s assertion that initial price discounting (low-balling) is a consequence of future quasi-rent expectations [59]-[63].

Schatzberg [59] shows that dissimilarities in audit opinions regarding different reporting matters result in future quasi-rents. Further, a client's unfamiliarity with its choice of auditor type brings future quasi-rents [59]. Jeffrey and Galen [60] suggest that an incumbent auditor becomes aware of its costs, getting an informational advantage. This benefit helps the incumbent auditor to engage in low-balling in the initial engagement [63] and gain quasi-rents in the subsequent contracts [60], 62].

Unlike DeAngelo [57], Dye [58] suggests that public disclosure of audit fees prevents a price reduction and enhances auditor independence because it eliminates the future quasi-rents. Dye [58] argues that transaction costs do not lead to initial fee discounting, as discounts are because of an incumbent auditor's bargaining power to determine its future audit fees. If auditees obtain the bargaining power, they do not allow their audit firms to charge higher than avoidable costs, eliminating the initial discounts [13], [58]. Conversely, non-disclosure may lead to price reduction and lack of independence, as it encourages clients to persuade their audit firms with their positive quasi-rents [13], [58]. Although a mandatory fee disclosure setting can prevent low-balling practices [64], Dye [58] argues that non-observability of quasi-rents rather than the presence of transaction costs is the cause of an initial audit price discounting [58].

III. Hypothesis Development

A. Auditor Switch and Audit Fees

There is no recent Australian study on the relationship between auditor switch and audit fees. However, a few early studies examined this relationship in Australia [11]- [14]. For

example, Francis [11] analysis of 150 industrial companies listed on the ASX from 1974 to 1978 does not find any evidence of initial discounting. Similarly, Butterworth and Houghton [12] analysis of 268 firm-year observations in Western Australia find no evidence of any significant price differences between the initial and subsequent engagements in 1987. Subsequently, Craswell and Francis [13] document that public disclosure of audit fees prevents discounting in initial engagements. Kallunki et al. [65]'s study of 10 different countries (including Australia) between 1993 and 2003 shows that strict legal requirements encourage auditees to require a higher level of audit fees reduction to switch their auditors in Australia.

Prior United States (US) studies provide mixed evidence regarding the effects of an auditor switch on audit fees [7], [33], [66], [67]. For example, Baber et al. [66] find an audit fee cutting occurs in first engagements. Furthermore, a price increase happens since second engagements, though the rise does not reach the predecessor auditor's last price [66]. Simon and Francis [7] show that companies that switch their auditors experience a significant drop in their initial audit fees. However, they start to pay standard fees since their fourth engagements [7]. Pearson and Trompeter [33] suggest that initial discounting occurs whenever auditees switch their audit firms among market leaders, whereas it does not happen when clients change their auditors from market non-leaders to market leaders [33].

Prior British studies, similar to US studies, do not provide a consistent result about the effects of an auditor switch on audit fees [44], [68], [69]. For example, Pong and Whittington [68] show that initial discounting is more likely to occur in first engagements than the following, though Big Four audit firms are less likely to engage in discounting. In contrast, Beattie and Fearnley [44] show that a fee reduction may encourage unsatisfied clients to retain their incumbent auditor. Gregory and Collier [69] suggest that low-balling happens during the first three years of engagement, whereas price differences are minor during the fourth and fifth years.

A comparison of initial audit fees between settings where audit fees are disclosed (such as Australia) and where audit fees are not disclosed (such as the US) may permit a distinction between DeAngelo [57] and Dye [58] models [13]. Some US studies show significant initial discounting [7], [33], [54], [66], [70], [71]. However, other US studies do not find any significant initial discounting [26], [72]-[75]. Australia, like the US, requires public disclosure of audit fees [13]. Following Dye [58], we argue that public disclosure of audit fees in Australia will deter auditors from discounting their initial audit fees. Specifically, initial discounting of fees could be suggestive of lower audit quality (less audit efforts) and/or auditor's tendency to exploit quasi-rents in the future. Moreover, recent corporate governance reforms (as previously discussed) aimed at preserving auditor's independence and ensuring high-quality audit would suggest that auditors in Australia are unlikely to discount their initial audit fees. Thus, we hypothesise the following:

- H1: An auditor switch does not affect initial audit fees in Australia.

B. Auditee's Industry and Audit Fees

An industry to which a firm pertains can affect its audit fees, because auditing may be less cumbersome in some industries [33], [71]. For example, utilities are easier to audit than clients with an extensive inventory, receivables, or knowledge-based assets [33]. Similarly, mining companies in Western Australia have less-diverse asset bases, reducing their audit fees [12]. Furthermore, auditors are aware of benefits of their specialisation in an industry [76]. Industry specialist Big Four audit firms have consistent audit programme and training in different industries [32]. They earn 34% more premium than non-specialist Big Four in Australia [14]. Similarly, controllers of Fortune 1000 value industry expertise of auditors in the US [77], [78].

Auditor's specialisation in an industry can affect lowballing practices for two reasons [79]. First, because of their efficiency to conduct an audit, their specialisation brings them economies of scale [79]. Thus, auditors are able to reduce their initial costs, resulting in lower fees. Second, an auditor's industry specialisation enables them to conduct higher-quality audits. Therefore, they do not need to reduce their fees as clients that need their services may not have any other choice [79]. So, an auditor's specialisation in an industry can either increase or decrease its audit fees.

Empirical research suggests Australian companies that have an audit committee and have boards with non-executive directors are more likely to hire an industry specialist auditor [80]. This preference is because auditor's industry specialisation restricts earnings management [81] and increases earnings quality [9]. Furthermore, specialisation may reduce audit fees if audit firms transfer their efficiencies to their clients [14].

An auditee's industry-specific characteristics affect its auditor's working hours [76]. Different characteristics may result in various audit hours in unrelated industries [76]. For example, differing nature of assets in financial and industrial sectors lead to different audit hours among them [76]. This difference in audit hours is likely to give rise to dissimilar fees in those industries [76]. Thus, although we do recognise that audit fees may vary across industries, we refrain from providing a directional hypothesis. Hence, our next hypothesis is as follows:

- H2: An auditee's industry membership is associated with its audit fees in Australia.

C. Auditee's Location and Audit Fees

An auditee's location is likely to affect its audit quality, as different environments have diverse requirements [82]. For example, a long geographical distance between a client and its audit firm increases its audit cost [83] and may delay the provision of the audit report [84]. Regions with high disclosure requirements have more audit tasks and high audit hours [82], hence higher fees. Moreover, location reflects local market characteristics [85]. For example, Australian audit firms face longer audit partner tenure outside of Sydney,

Melbourne, and Brisbane [16]. Furthermore, a location's characteristics influence auditors' national and international outsourcing relationships [86].

A client's location may affect its audit engagement coordination [87], as it is a reflection of the auditee's complexity and the required audit effort [88]. Certain locations require a higher coordination level and are more complex. The existence of multiple work locations makes it difficult for employees to share their knowledge and coordinate with each other [89], [90]. Audit firms need to use more resources to enable effective coordination among their personnel, increasing their coordination costs [86]. This audit task complexity creates higher costs [86].

Prior research suggests that an auditee's location affects its audit fee also because costs are different in various places [34], [87], [88], [91], [92]. A location's costliness increases its service fees [93]. Further, audit staff costs are higher in certain locations than others. Audit personnel require higher pays in expensive markets [91]. Moreover, audit fees are higher in expensive cities [34]. For example, London has higher fees than other areas in the United Kingdom (UK) [94]. Audit firms transfer this extra cost to their clients as higher fees [91].

Similar to an auditee's industry, its location may positively or negatively affect its audit fees. Thus, the next hypothesis of this study is as follows:

- H3: An auditee's location is associated with its audit fees in Australia.

IV. Research Design

Hay et al. [95] review and summarise prior literature on the determinants of audit fees. Their study uses a meta-analysis to examine the effects of previous well-known independent variables on audit fees. Following [95], we propose the following base model for explaining the level of audit fees:

$$\ln f_i = b_0 + b_1 \ln A_i + \sum b_k g_{ik} + e_i \quad (1)$$

where $\ln f_i$ is the natural log of an auditee's audit fees in dollar value, $\ln A_i$ is the natural log of the size of an auditee's revenue in dollar value [96], [97] and g_{ik} (control variables) are the two drivers of audit fees. To test the hypotheses, we extend model (1) by incorporating three new variables (g_{ie}): auditor switch, client's industry, and client's location. Thus, our extended model is specified as:

$$\ln f_i = b_0 + b_1 \ln A_i + \sum b_e g_{ie} + \sum b_k g_{ik} + \varepsilon_i \quad (2)$$

Our choice of control variables in models (1) and (2) are guided by Hay et al. [95]. Prior studies show that audit committee size [98], audit committee independence [99], audit committee expertise [100], auditor quality [101], audit problem [26], provision of non-audit services [102], [103], leverage [104], inventory [105], and receivables [105], [106] have a positive relationship with audit fees. However, auditor switch in the first year after a switch [7], [54], [107], [108], return on assets (ROA) [26], [109], and quick ratio [106] have a negative relationship with audit fees. These are employed as the control variables in model (1).

This study measures audit committee size as the number of directors serving on an audit committee [98], audit committee independence as the percentage of independent members in an audit committee [99], [110], audit committee expertise as an audit committee with at least one member with accounting or finance expertise [99], [100], [110], auditor quality through consideration of Big Four auditors as a proxy for auditor quality [104], [111]-[113], audit problem as issuance of an auditor's report than clean [107], [114], ROA as net income divided by total assets [105], [115], [116], leverage as total liabilities divided by total assets [109], [116], [117], quick ratio as current assets minus inventories divided by current liabilities [115], [118], [119], inventory as total inventories divided by total assets [26], [115], and receivables as total receivables divided by total assets [26], [115]. Table I summarises the variables of the audit fees model in this study.

A. Sample and Data

The sample in this study comprises those ASX top 500 firms that experienced at least one auditor switch over the 2006-2016 period. The data are obtained from ASX, Connect 4, Morningstar, and companies' annual reports. Auditing and Assurance Standards Board's auditing standards under the Legislative Instruments Act 2003 took effect in July 2006 in Australia [120]. Therefore, this study examines audit fees data of the ASX 500 companies from 2006, and it considers a 10-year period (2006-2016) to obtain sufficient data, based on their market capitalisation at 30 June 2016. Global Industry Classification Standard (GICS) system has 10 economic sectors, 23 industry groupings, 59 industries, and 122 sub-industries [121]. This study considers all ASX industry classifications.

This study examines all Australian states and territories. It considers headquarters' locations of the ASX 500 firms. Specifically, 193 headquarters are in New South Wales, 132 in Victoria, 83 in Western Australia, 47 in Queensland, 17 in South Australia, and three in Tasmania and Australian Capital Territory. There are no headquarters in Northern Territory. There were 282 instances of auditor switch among the ASX top 500 firms since 2006 until 2016. These 282 instances relate to 205 companies, as some companies have a few different switching instances throughout the period. Among these 205 companies, 76 are based in Sydney, 50 in Melbourne, 43 in Perth, 19 in Brisbane, four in Adelaide, three in Gold Coast, two in Canberra and Newcastle, and each of the cities of Bundaberg, Hobart, Ipswich, Launceston, Queanbeyan, and Townsville had only one headquarters.

B. Descriptive Statistics

Table II reports auditor switches aggregated over the sample period. Over the 10-year period (2006-2016), there had been a total of 282 incidents of auditor switch. During the sample period, there were 112 switches from Big Four firms and 170 switches from non-Big Four firms. Of the 112 switches, 81 (72%) switches occurred within the Big Four firms. Of the 170 switches from non-Big Four firms, 74 (44%)

client firms switched to Big Four firms and 96 (56%) firms switched within non-Big Four firms. In sum, there were 155 switches to Big Four firms and 127 switches were to non-Big Four firms. A chi-squared test of independence suggests that auditor switches to/from Big Four/non-Big Four are not statistically independent events ($\chi^2 = 282.00$, p-value < 0.001). Thus, it is clearly evident that Big Four firms have captured a bigger share of the Australian audit market over the sample period. In sum, Table II exhibits that the Australian audit market is being increasingly concentrated in the hands of the Big Four firms.

TABLE I
VARIABLE DEFINITIONS

Variable	Definition
LnAuditFees	Natural log of an auditee's audit fees in dollar value
LnRevenue	Natural log of an auditee's sales revenue in dollar value
Auditor Switch	The occurrence of an auditor switch – Yes = 1 and No = 0
Sydney	A dummy variable set equal to 1 if Sydney is the location of an auditee
Melbourne	A dummy variable set equal to 1 if Melbourne is the location of an auditee
Perth	A dummy variable set equal to 1 if Perth is the location of an auditee
Brisbane	A dummy variable set equal to 1 if Brisbane is the location of an auditee
Adelaide	A dummy variable set equal to 1 if Adelaide is the location of an auditee
Hobart	A dummy variable set equal to 1 if Hobart is the location of an auditee
Canberra	A dummy variable set equal to 1 if Canberra is the location of an auditee
Consumer Discretionary	GICS Sector – Consumer Discretionary
Consumer Staples	GICS Sector – Consumer Staples
Energy	GICS Sector – Energy
Financials	GICS Sector – Financials
Health Care	GICS Sector – Health Care
Industrials	GICS Sector – Industrials
Information Technology	GICS Sector – Information Technology
Materials	GICS Sector – Materials
Telecommunication Services	GICS Sector – Telecommunication Services
Transportation	GICS Sector – Transportation
Utilities	GICS Sector – Utilities
AC Size	An auditee's audit committee size – Number of directors serving on an audit committee
AC Independence	An auditee's audit committee independence – Percentage of independent members in an audit committee
AC Expertise	An auditee's audit committee expertise – An audit committee with at least one member with accounting or finance expertise
Big Four	A measure of auditor quality – A Big Four auditor = 1 and a non-Big Four auditor = 0
Audit Problem	Existence of an audit problem – A non-clean auditor's report = 1 and a clean auditor's report = 0
Non-audit Services	Provision of non-audit services to a client – Yes = 1 and No = 0
ROA	Return on assets – Net income divided by total assets
Debt Ratio	Debt Ratio – Total liabilities divided by total assets
Quick Ratio	Quick Ratio – Current assets minus inventories divided by current liabilities
Inventory	Inventory – Total inventories divided by total assets
Receivables	Total receivables divided by total assets

TABLE II
AUDITOR SWITCH IN THE ASX 500 FIRMS: 2006-2016

		Switch to		
		Big Four	Non-Big Four	Row Total
Switch from	Big Four	81 (72%, 52%)*	31 (28%, 24%)*	112 (40%)**
	Non-Big Four	74 (44%, 48%)*	96 (56%, 76%)*	170 (60%)**
	Column Total	155 (55%)**	127 (45%)**	282

* The two numbers in the parentheses represent the percentage of the respective row total followed by the percentage of the respective column total.
** The percentage of auditor switch by each type of switch (Big Four versus Non-Big Four).

Table III reports descriptive statistics of the audit, non-audit, and total fees for the sample firms during the 2006-2010 period. The mean (median) audit fees over the sample period is $335 919 ($125 000). The mean (median) audit fees of $553 219 ($217 000) charged by the Big Four firms are significantly larger than those of the non-Big Four firms (mean audit fees = $99 169, median audit fees = $63 069). A paired-samples t-test [122], [123] suggests that the audit fees charged by the Big Fours and the non-Big Fours are statistically significantly different (t-statistic = 9.32, p < 0.001).

Clearly, given that client firm size is the single most important driver of audit fees [95], the largest and most complex ASX-listed firms are audited by the Big Fours. This pattern is reflected in non-audit fees as well. For the full sample, the mean (median) non-audit fees are $175 177 ($22 000). The Big Four firms have a mean (median) non-audit fees of $306 798 ($64 600) compared with $32 047 ($7 490) for the non-Big Four firms.

Unreported analysis suggests that diversified financials, metals and mining, software and services, and real estate investment trusts are the most dominant industry sectors in the

ASX comprising 12%, 12%, 8.42% and 8% of the sample firms, respectively. These sectors are also slightly over-represented in the incidents of auditor switching. With diversified financials, metals and mining, software and services, and real estate investment trusts registering 14.63%, 13.17%, 8.78%, and 9.76% of the auditor switches, respectively. That is, these four sectors together account for 46.34% of the auditor switches during the sample period.

Table IV reports the descriptive statistics of audit fees identified at city-level based on where the headquarters of the clients are located. As Table IV reveals, Canberra has the lowest mean (median) audit fees of $122 948 ($102 500) followed by Perth $143 535 ($87 500), Adelaide $190 716 ($152 598), Hobart $207 500 ($207 500), Brisbane $232 489 ($145 000), Melbourne $321 389 ($125 500), and Sydney $513 726 ($143 600). Such differences in audit fees are consistent with the scale of the city economies in Australia. Notably, Sydney, Melbourne, and Brisbane are the three largest cities of Australia.

TABLE III
DESCRIPTIVE STATISTICS OF THE AUDIT, NON-AUDIT, AND TOTAL FEES OF ASX 500 COMPANIES WITH AN AUDITOR SWITCH (2006 - 2016)

		Top 500 Companies	Big Four Audited ASX 500 Companies	Non-Big Four Audited ASX 500 Companies
Audit Fees ($)	Mean	335 919	553 219	99 169
	Median	125 000	217 000	63 069
	Standard Deviation	1 119 677	1 515 087	110 486
Non-audit Fees ($)	Mean	175 177	306 798	32 047
	Median	22 000	64 600	7 490
	Standard Deviation	710 357	963 256	73 856
Total Fees ($)	Mean	510 924	859 437	131 216
	Median	161 500	311 655	77 254
	Standard Deviation	1 739 538	2 350 960	164 938

TABLE IV
DISTRIBUTION OF AUDIT FEES ACROSS MAJOR AUSTRALIAN CITIES: 2006-2016

	Mean ($)	Std. Deviation ($)	First Quartile ($)	Median ($)	Third Quartile ($)	95th Percentile ($)
Adelaide	190 716	134 847	102 000	152 598	250 000	372 800
Brisbane	232 489	222 191	87 500	145 000	305 000	762 000
Canberra	122 948	70 257	61 500	102 500	193 754	213 073
Hobart	207 500	45 962	175 000	207 500	240 000	240 000
Melbourne	321 389	612 603	62 000	125 500	258 918	1 600 000
Perth	143 535	224 545	35 450	87 500	172 900	441 265
Sydney	513 726	1 741 591	51 000	143 600	311 500	2 274 000
Non-capital Cities	197 744	206 553	74 250	118 000	250 033	781 079

C. Correlations and Model Specification

Model (1) is tested for multicollinearity and Bayesian information criterion (BIC) before empirical estimation. Multicollinearity can bias the interpretation of outcomes of a study [124]. Therefore, to assess the extent of multicollinearity, this study examines variation inflation factors (VIF). A VIF value greater than 10 signals a serious multicollinearity problem [125]-[128]. Several variables obtain VIF values greater than 10. Nevertheless, all values fall below 10 after this study drops the variables Sydney, consumer discretionary and transportation in industry sectors.

BIC can assess how well a model fits its data, helping to choose the best model among different ones [129]. The model with the lowest BIC value is the best fit [130]. This study uses BIC to explore whether dropping any of the variables can improve the model specification. Exclusion of Sydney, consumer discretionary, and transportation reduces the BIC value by 7.637 from 4749.349 to 4741.712. A BIC value reduction between six and 10 suggests a strong improvement in the fitness of a model [131]. Therefore, the variables Sydney, consumer discretionary, and transportation are removed from further analysis.

V. RESULTS

A. Main Results

Table V reports the results of ordinary least squares (OLS) estimates of the base audit fee model and the extended audit fees model. In the base model, the adjusted R^2 of 68% is comparable to those reported in similar studies (e.g., [98], [110]).

In the results of the base model (model (1)), consistent with previous studies (e.g., [95], [132]), the variable LnRevenue has the strongest explanatory power for audit fees (*t*-statistic = 40.090, *p*-value < 0.001). In model (1), among the governance-related variables, audit committee size (AC Size) and audit committee independence (AC Independence) have the expected positive signs and are statistically significant with the *t*-statistic (*p*-value) of 6.950 (< 0.001) and 2.920 (0.004), respectively. However, the variable audit committee expertise (AC Expertise) is not statistically significant (*t*-statistic = 1.040, *p*-value = 0.299). Consistent with the extant literature, we find evidence of Big Four audit fee premium; the variable Big4 is positive with a *t*-statistic of 13.550 (*p*-value < 0.001). Again, consistent with the extant literature, we find

evidence that audit problems and the provision of non-audit services increase audit fees. The variables Audit Problem and Non-audit Services are positive and statistically significant (*t*-statistic = 5.180, 4.400; *p*-value < 0.001, < 0.001, respectively). Among the variables related to client firm characteristics, ROA, Debt ratio, Quick ratio, Inventory, and Receivables are all statistically significant. Our results are consistent with the extant literature that both firm profitability (ROA *t*-statistic = -5.170, *p*-value < 0.001) and firm liquidity (Quick ratio *t*-statistic = -2.160, *p*-value = 0.031) are negatively associated with audit fees. However, unlike prior studies [104], [105], we find that higher levels of inventory and accounts receivables reduce audit fees; the coefficients of the variables Inventory and Receivables are negative and statistically significant (*t*-statistic = -8.380, -3.130; *p*-value < 0.001, = 0.002, respectively).

TABLE V
OLS ESTIMATES OF THE AUDIT FEE MODELS (1) AND (2)

LnAuditFees		Coeff.	*t*-stat	*p*-value	Coeff.	*t*-stat	*p*-value
	Expected sign	Base Model			Extended Model		
Intercept	?	5.274	40.040	0.000	5.531	37.63	0.000
LnRevenue	+	0.326	40.090	0.000	0.317	37.17	0.000
AC Size	+	0.104	6.950	0.000	0.105	6.83	0.000
AC Independence	+	0.001	2.920	0.004	0.001	2.74	0.006
AC Expertise	+	0.050	1.040	0.299	0.039	0.79	0.427
Big4	+	0.522	13.550	0.000	0.511	13.03	0.000
Audit Problem	+	0.459	5.180	0.000	0.391	4.28	0.000
Non-audit Services	+	0.186	4.400	0.000	0.175	4.15	0.000
ROA	-	-0.004	-5.170	0.000	-0.003	-4.49	0.000
Debt Ratio	+	0.406	4.830	0.000	0.440	4.96	0.000
Quick Ratio	-	-0.003	-2.160	0.031	-0.004	-2.86	0.004
Inventory	+	-1.205	-8.380	0.000	-1.210	-7.27	0.000
Receivable	+	-0.428	-3.130	0.002	-0.317	-2.16	0.031
Auditor Switch	-				-0.023	-0.34	0.731
Consumer Staples	?				0.083	1.18	0.239
Energy	?				0.180	2.53	0.011
Financials	?				0.189	2.76	0.006
Health Care	?				0.055	0.90	0.368
Industrials	?				-0.090	-1.71	0.087
Information Technology	?				-0.183	-2.83	0.005
Materials	?				0.123	2.31	0.021
Telecommunication Services	?				-0.188	-1.63	0.103
Utilities	?				-0.137	-1.03	0.304
Melbourne	+				0.038	0.93	0.350
Perth	-				-0.301	-6.25	0.000
Brisbane	-				-0.183	-3.50	0.000
Adelaide	-				-0.080	-1.06	0.292
Hobart	-				-0.571	-2.56	0.011
Canberra	-				-0.143	-0.64	0.521
		Prob > F = 0.000, F(12, 2257) = 403.54, Adj R^2 = 0.680			Prob > F = 0.000, F(28, 2151) = 182.97, Adj R^2 = 0.701		

All variable definitions are in Table I.

In Table V, the extended model (model (2)) explains 70.1% of the variations in audit fees. Thus, model (2) has an incremental explanatory power for audit fees beyond model (1). Moreover, results for the control variables are qualitatively similar to those reported under model (1). In model (2), the variables of interest to us are Auditor Switch, city locations, and industry memberships of clients. As Table V shows, Auditor Switch is statistically non-significant (*t*-statistic = -0.34). Thus, H1 is supported. That is, auditor switch in the ASX 500 firms does not affect audit fees. In relation to industry membership, the dummy variables Energy (*t*-statistic = 2.53, *p*-value = 0.011), Financials (*t*-statistic = 2.76, *p*-value = 0.006) and Materials (*t*-statistic = 2.31, *p*-value = 0.021) are positive and statistically significant. Thus, in these industries audit fees are higher than in other industries potentially due to greater audit complexity and audit efforts. On the other hand, audit fees are lower in Industrials (*t*-statistic = -1.71, *p*-value = 0.087) and Information Technology (*t*-statistic = -2.83, *p*-value = 0.005). Thus, the results in Table V are consistent with H2 in that industry membership can influence audit fees beyond the well-documented drivers of audit fees. Overall, the results in Table V support the findings of early studies that an auditee's industry membership affects its audit fees [12], [33], [71].

To test H3, six dummy variables representing six capital cities in Australia are introduced in model (2). These cities are Adelaide, Brisbane, Canberra, Hobart, Melbourne, and Perth.

Sydney is used as the baseline city and thus omitted from model (2). Among the city locations, compared with those in Sydney, audit fees in Brisbane (*t*-statistic = -3.50, *p*-value < 0.001), Hobart (*t*-statistic = -2.56, *p*-value = 0.011) and Perth (*t*-statistic = -6.25, *p*-value < 0.001) appear to be lower. On the other hand, although the coefficient on Melbourne is positive, it is statistically non-significant (*t*-statistic = 0.93, *p*-value = 0.350). These results are not surprising given Sydney is the most expensive city in Australia [133] followed by Melbourne, Brisbane, Perth, and Hobart [134]. In sum, the results in Table V support prior research that an auditee's location affects its audit fees [34], [87], [88], [91], [92].

Overall, the findings of this study are consistent with the predictions of Dye [58]. The results so far support all the three hypotheses in this study. Auditor switch does not affect audit fees, supporting H1. However, industry affects audit fees, supporting H2. This effect occurs in information technology, financials, energy, and materials sectors among the ASX 500 firms. Financials, energy, and materials sectors face a fee rise, whereas information technology sector has a fee reduction. Moreover, location affects audit fees, supporting H3. The ASX top 500 firms in Hobart, Perth, and Brisbane experience a fee reduction compared with Sydney. Among all the capital cities in Australia, Hobart experiences the lowest audit fees.

B. Robustness Checks

We undertake further tests to check the robustness of our main results. First, following prior studies [135]- [138], we undertake the Breusch and Pagan [139] test to determine the extent of heteroscedasticity problem in our OLS estimations. The test obtains an insignificant probability value at 5% (chi2 = 11.28, p = 0.113). Therefore, heteroscedasticity does not appear to be a serious concern in this study.

TABLE VI
RANDOM-EFFECTS ESTIMATION OF MODELS (1) AND (2)

LnAuditFees	Coef.	z	P>z	Coef.	z	P>z
	Base Model			Extended Model		
_cons	7.237	43.390	0.000	7.479	38.940	0.000
LnRevenue	0.234	24.740	0.000	0.228	23.540	0.000
Audit Committee Size	0.053	3.850	0.000	0.054	3.820	0.000
Audit Committee Independence	0.001	1.890	0.059	0.001	1.960	0.050
Audit Committee Expertise	0.079	1.630	0.102	0.081	1.660	0.097
Big4	0.520	10.310	0.000	0.503	9.670	0.000
Audit Problem	0.072	0.900	0.368	0.032	0.380	0.703
Non-audit Services	0.109	2.850	0.004	0.106	2.730	0.006
ROA	-0.001	-0.940	0.345	-0.001	-0.920	0.360
Debt Ratio	0.462	4.860	0.000	0.432	4.400	0.000
Quick Ratio	-0.004	-3.840	0.000	-0.004	-4.030	0.000
Inventory	-0.603	-2.630	0.008	-0.644	-2.560	0.010
Receivable	-0.488	-2.700	0.007	-0.426	-2.270	0.023
Auditor Switch				0.013	0.250	0.806
Consumer Staples				0.208	1.480	0.138
Energy				0.240	1.770	0.077
Financials				0.143	1.120	0.264
Health Care				-0.081	-0.710	0.476
Industrials				0.006	0.050	0.956
Information Technology				-0.263	-2.210	0.027
Materials				0.170	1.680	0.093
Telecommunication Services				-0.208	-0.930	0.351
Utilities				0.049	0.220	0.824
Melbourne				0.023	0.300	0.766
Perth				-0.481	-5.100	0.000
Brisbane				-0.232	-2.340	0.019
Adelaide				-0.249	-1.670	0.094
Hobart				-0.895	-2.210	0.027
Canberra				-0.186	-0.400	0.691
	Wald $\chi^2(12)$ = 1436.38, Prob > χ^2 = 0.000			Wald $\chi^2(28)$ = 1555.88, Prob > χ^2 = 0.000		

Results reported in Table V are based on pooled OLS regressions of models (1) and (2). Results in pooled OLS estimates may be biased due to cross-sectional and serial correlations [140]. To address these concerns, we employ the random-effects estimation technique for models (1) and (2). We report these new results in Table VI. Our choice of the random-effects technique as opposed to the fixed-effects technique is guided by the following. A fixed-effects model fails to assess the likely difference between time-invariant and time-varying effects of a variable [141]. It loses some important information due to the removal of higher-level variances including their significance level [142]. This adverse

effect is critical whenever time-invariant variables are important [143]. Moreover, exclusion of time-invariant variables can affect time-varying variables [144], [145] and cause a time-varying variable's estimation to consider a small portion of its variance [143]. However, a random-effects model can correct serial correlations and control for omitted variables [112]. A random-effects model creates reliable results even in cases with violation of normality assumptions [146]. Thus, it is frequently used in epidemiology [147] and political science [146] studies.

In Table VI, the results are qualitatively similar to those reported in Table V. In the base model, LnRevenue is the strongest driver of audit fees. All other variables have the expected signs and significance as reported in Table V. In the extended model (model (2)), the variable Auditor Switch is again non-significant (z-statistic = 0.250, p-value = 0.806). Consistent with the results in Table V, the coefficients on the variables Energy, Information Technology, and Materials are statistically significant (z-statistic = 1.770, p-value = 0.077; z-statistic = -2.210, p-value = 0.027; z-statistic = 1.680, p-value = 0.093; respectively). However, the variables Financials and Industrials lose their significance. Among the city-location variables, again Brisbane, Hobart, and Perth have negative and statistically significant coefficients (z-statistic = -2.340, p-value = 0.019; z-statistic = -2.210, p-value = 0.027; z-statistic = -5.100, p-value < 0.001; respectively). The results for the control variables in model (2) are qualitatively similar to those in Table V. Overall, the results obtained in Table VI through a random-effects estimation are generally consistent with those obtained through OLS estimation in Table V.

VI. Conclusion

The analysis of the effects of auditor switch, industry, and location on audit fees in Australia was the aim of this study. The study used fee data of ASX 500 firms. It considered all industry sectors throughout the country since 2006 until 2016, based on their market capitalisation at 30 June 2016. This study is primarily motivated by the non-trivial presence of auditor switch even within the ASX 500 firms. On average, in a given year, 5% of the ASX top 500 firms switched their auditor between 2006 and 2016. An auditor switch potentially creates an opportunity for fee discounting (low-balling) in the first year of engagement which in turn can raise questions about audit quality. Given the availability of audit fees data, the Australian setting offers an excellent opportunity to investigate whether auditor switch affects audit fees. Our study is also motivated by significant regulatory changes in Australia following early studies of audit fees. Subsequent to early audit pricing studies in Australia (e.g., [11]-[14]), Australia has introduced CLERP 9 that requires disclosure of non-audit fees. Moreover, the ASX Corporate Governance Council issued 'if not, why not' type governance standards that potentially have implications for audit fees and audit quality.

Our analysis shows that there were 282 instances of auditor switch among the ASX top 500 firms between 2006 and 2016. Of these, 155 switches (55%) were to Big Four and 127 (45%) switches to non-Big Four. There is evidence of increased audit market concentration within the ASX top 500 firms; firms switch more frequently from non-Big Fours to Big Fours than they do from Big Fours to non-Big Fours. Big Four audit firms earn much larger audit and non-audit fees than non-Big Fours. Metals and mining and diversified financial sectors take account of almost a quarter of switches. Moreover, banks and technology hardware and equipment sectors have the highest and lowest audit fees, respectively.

Following prior studies, we employ a parsimonious model that captures the most significant drivers of audit fees. Then we extend our model to incorporate the variables of interest to us: auditor switch, client's industry membership, and client's location (headquarters). We estimate our models using both OLS regression and a random-effects technique. Overall, we obtain consistent results across these two estimation techniques. Our results are consistent with all of the three hypotheses. We find that auditor switch does not affect audit fees. However, audit fees are higher in some industries as opposed to other industries. We also find evidence that the ASX top 500 firms with headquarters in Brisbane, Hobart, and Perth pay lower audit fees compared to firms in other cities. Moreover, consistent with prior studies [95], [96], we find that a firm's sales revenue is the most significant driver of its audit fees.

We make three contributions to the audit fees literature in Australia. First, we provide recent evidence of the price efficiency of the audit market in Australia. Our results suggest auditor switch does not lead to a significant price reduction in the initial audit engagement. To the extent audit fees reflect audit quality [35], [36], our results are likely to enhance users' confidence in the audit reports in Australia. Second, we provide recent evidence of geographic and industry segmentation of the Australian audit market. Specifically, auditees located in Brisbane, Hobart, and Perth pay significantly lower audit fees and clients in the financials, energy, and materials sectors pay significantly higher audit fees. Third, we provide recent evidence that the Australian audit market is increasingly being concentrated in the hands of the Big Fours with more firms switching from non-Big Fours to Big Fours. Such concentration of the audit market could be the result of several factors, including increased audit complexity over time, demand for higher audit quality over time, and competitive advantages of the Big Four auditors over non-Big Fours. Nevertheless, this study has several limitations. First, we examined only the ASX top 500 firms. Thus, our results may not be generalizable outside our sample. Future research may want to replicate our study in a sample of all Australian public listed firms. Second, we excluded Sydney from our multivariate analysis due to a multi-collinearity problem. Sydney has more top 500 firms than any other city in Australia. Third, there are a few ASX top 500 firms in Canberra and Hobart, questioning the validity of the findings regarding these two cities. Fourth, there are other ways to measure control variables; we did not explore all of them. For example, some researchers measure an auditee's size by its total assets [87], [132].

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