THE ROLE OF AUDITORS IN DETECTING CREATIVE ACCOUNTING: SINGAPOREAN AND AUSTRALIAN EVIDENCE

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Abstract

This study examines the association between the magnitude of earnings management and two characteristics of auditor value - auditor independence and auditor quality. As earnings management, auditor independence and auditor quality are unobservable the study uses absolute discretionary accruals, the ratio of non-audit to total fees and auditor industry specialisation as respective proxies. This study finds no empirical evidence that non-audit services are associated with firms' discretionary accruals. This result suggests that the provision of non-audit services by the incumbent auditor does not compromise independence. This study presents evidence of a negative association between auditor specialisation and the earnings management indicator. This finding infers that the magnitude of earnings management amongst firms engaging the services of a specialist is significantly lower than firms purchasing audit services from a non-specialist auditor.

Keywords: Earnings management; Auditor independence; Auditor quality.

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1. Introduction

This study investigates the association between earnings management and two major auditor values: independence and quality[42]. It utilises a sample of 615 listed firms on the Singapore Stock Exchanges (SGX) and Australian Stock Exchange (ASX). The cross-sectional modified Jones (1991) model is used to measure discretionary accruals, the proxy for earnings management. Consistent with previous research, this study uses the ratio of non-audit fees to total fees as a proxy for auditor independence (e.g., Scheiner 1984; Firth 1997b; Gore, Pope, and Singh 2001; Frankel, Johnson, and Nelson 2002; Larcker and Richardson 2004; Lin and Hwang 2010) and audit firm industry specialisation to proxy auditor quality (e.g., Pearson and Trompeter 1994; Craswell et al. 1995; Hogan and Jeter 1999; DeFond et al. 2000; Ferguson and Stokes 2002; Gul, Fung, and Jaggi 2009). I apply a 20% market share threshold across all industries to denote an industry specialist.

Recent high profile accounting scandals have prompted a global focus on the nature, constraints and factors that may influence earnings management (Arya, Glover, and Sunder 2003; Imhoff 2003; He, Wright, and Evans 2009; Iyengar, Land, and Zampelli 2010). A particular facet of this attention has been the impact of auditor independence on constraining the magnitude of earnings management (Becker, DeFond, Jiambalvo, and Subramanyam 1998; Krishnan 2003a). The practice of earnings management erodes investors' confidence in financial reporting quality and impedes the efficient flow of capital in financial markets (Jackson and Pitman 2001). Policy makers (e.g., Levitt 1998), popular press articles (e.g., MacDonald 2001; Liesman, Weil, and Schroder 2002) and scholarly researchers (e.g., Frankel et al. 2002; Cahan, Emanuel, Hay, and Wong 2008) have argued that the provision of more non-audit services to a client increases the economic bond, leading to the impairment of an auditor's independence. Conversely, as an audit market matures, it is suggested that audit firms must differentiate themselves, for example, via specialisation (Watkins, Hillison, and Morecroft 2004). Some researchers (e.g., Craswell et al. 1995; Beasley and Petroni 2001) note that specialisation enables the auditor to provide superior services and credibility. Consequently, the auditor is able to conduct a more effective audit enhancing the ability to detect and constrain earnings management (Krishnan 2003b).

There is mixed empirical support of any association of such rules with earnings management. In addition, the majority of prior empirical studies have focused on auditor independence or auditor quality in isolation rather

[42] Prior research that was conducted by Rusmin (2010) investigated the association between the magnitude of earnings management and auditor quality using Singaporean dataset. The current study uses two auditor characteristics (auditor independence and auditor quality) in conjunction to predict the level of earnings management of public firms listed on both Singapore and Australian Stock Exchange.

than in combination (e.g., Gore et al. 2001). The brief review highlights significant gaps in the literature. Consequently this study seeks to address the following research question: *Is the level of auditor independence and auditor quality amongst listed companies in Singapore and Australia associated with the magnitude of earnings management?*

This study is significant for several reasons. Firstly, it provides further evidence on the relation between independence and quality of auditors and earnings management using data from different and previously little explored domestic settings of Singapore and Australia. Use of data from Singapore and Australia helps build a niche international profile of the association between auditor features and earnings management. In addition, the use of data from alternative domestic settings will help policy makers determine the validity of freely adopting policies applied in another nation without making adjustments for differences in institutional structures. Secondly, from a quantitative perspective, this study documents the methodological strengths regarding a broad range of explanatory control variables and the inclusion of companies from the two countries simultaneously. In examining the relationship between board structure and company performance, Vafeas and Theodorou (1998) claim that failure to control for other potential determinants of corporate governance may lead to misleading conclusions. This study seeks to improve on that notion by focusing on both auditor independence and auditor quality to predict the magnitude of earnings management. Thirdly, empirical findings provide insights for regulators (especially those in Singapore and Australia), the accounting profession, and market participants regarding recent corporate governance reform and its influence on the earnings management issue. Finally, due to the lack of availability of audit fee information, most prior studies used proxy variables clients' sales or assets to measure auditor industry market shares. This study improves on this approach by employing actual figures, which are audit fees, to estimate auditor industry market shares.

The remainder of this paper is organised as follows. The next section presents an overview of the business environment for the countries of Singapore and Australia. Section 3 establishes the theoretical framework underlying auditor independence and auditor quality–earnings management linkages. Hypothesis is also developed in this section. Section 4 describes the research design. Primary results including descriptive statistics, correlations and regression analysis are presented in Section 5. Results of the study and implications for future research are discussed in the concluding section.

2. Business environment of singapore and australia

The business environments of Australia and Singapore are fundamentally different. Australia, on 31 December 2003, has more publicly listed firms (1,471 firms listed in the ASX versus 413 Singaporean firms listed in the SGX) and larger market capitalisation (USD$583,260 million for Australia versus USD$225,036 million for Singapore). The mining sector in Australia comprises almost half of its publicly listed companies, while very few natural resources are available in Singapore.[43] Another important difference is that the public debt (measured as the percentage of GDP) in Australia is significantly smaller than public debt in Singapore (World Fact Book, 2004).

Although the two countries exhibit some differences, they have a similar legal system, based on English common law. A study conducted by La Porta, Lopez-de-Silanes and Shleifer (1998) reports that Australia has a legal enforcement score as high as Singapore's (9.4 and 8.9 respectively).[44] It is argued that earnings management is less pervasive in countries where the legal protection of outside investors is strong (Leuz, Nanda, and Wysocki 2003). Moreover, in a study of earnings management and investor protection, Leuz et al. (2003) put Australia and Singapore in the same cluster of 'outsider economies' with large stock markets, dispersed ownership structures, strong investor rights and strong legal enforcement. They argue that earnings management appears to be lower in this typical environment. Nonetheless, their results show that Singapore has a higher aggregate earnings management score than Australia (21.60 compared to 4.80 respectively). In other words, the practices of earnings management in Singapore are more pervasive than in Australia. One possible reason for this may be that, as stated above, Singapore has a much bigger portion of public debt (106.40% of GDP) compared to Australia's (18.20% of GDP). Numerous studies have investigated the incentives for companies with higher financial leverage levels in adopting income-increasing accounting techniques to reduce the possibility of debt default agreements (Trotman 1980; Duke and Hunt 1990; Press and Weintrop 1990; DeFond and Jiambalvo 1994; Sweeney 1994). These findings, therefore, support the argument that debt level plays an important role in

[43] The Singapore's economy was highly dependent on entreport trade and the provision of services to British military bases (Phan and Yoshikawa 2003).

[44] Legal enforcement is measured as the mean score across three legal variables: the efficiency of the judicial system, an assessment of rule of law, and the corruption index. All three variables range from zero to ten.

influencing management to manage their reported earnings.

3. Theoretical framework and hypotheses

The majority of the literature seeking to explain the incentives to manage earnings draws on costly contracting theory. This study utilises costly contracting theory which characterises corporation as a 'legal nexus of contractual relationship' and assumes that corporate reporting enables principals (shareholders) to monitor agents (managers) compliance with contractual obligations (Godfrey, Hodgson, and Holmes 2003). Jensen & Meckling (1976) identify the existence of two agency relationships: (1) the manager-shareholders (e.g, bonus plans) which the manager acts as an agent for the shareholders who are considered to be the owners; (2) the shareholder-debtholder (e.g., debt contracts) where the manager is assumed to act on behalf of the shareholders, thus the manager is an agent whereas the debtholder becomes the principal. Such situations impose agency costs, due to the existence of conflicts of interest between the agents and the principals. Bartov, Gul & Tsui (2001) note that agency costs include manager's incentive to manage earnings. Empirical evidence from agency theory also reports that management have a preference to manage earnings numbers in order to benefit from the contracting process (Holthausen, Larcker, and Sloan 1995).

Prior studies document that the higher transaction costs are translated from the greater information asymmetry among market participants. When the markets or investors have less information and cannot observe a company's performance and prospects, they then require higher rates of return and lower current company's stock prices (Bartov and Bodnar 1996). Several studies also document evidence that the existence of information asymmetry between managers and shareholders is a necessary condition for earnings management (Dye 1988). This is because shareholders have less information, thus corporate management can use its insider position to manage reported earnings (Lobo and Zhou 2001). Earnings management reduces the reliability of earnings because reported earnings is biased, and misrepresents the true reporting earnings figure. Arthur Levitts, Jr., (1998) the former chairman of SEC, states that practice of earnings management has negative effects on reliability and credibility of financial reporting. This study assumes opportunistic earnings management is best characteristised via accounting method choices and discretionary accruals (McNichols and Wilson 1988).

3.1. Auditor independence and earnings management

The agency model draws the role of the auditors as a monitoring mechanism to reduce agency costs (Jensen and Meckling 1976). Hirst (1994) claims that generally auditors are sensitive to earnings management and have a propensity to focus on managerial incentives to overstate earnings numbers. Auditing plays an important role both in the reduction of agency problems and information asymmetry by objectively verifying the validity of financial statements (Balsam et al. 2003). The effectiveness of auditing and its ability to constrain the earnings management depend on the objectivity, in other words, independence of auditors when perform an audit (OICU-IOSCO 2002). Thus, the more independent the auditor the more they will constrain earnings management.

There is contradictory empirical evidence pertaining to auditor-impaired independence due to the provision of non-audit services. Frankel et al. (2002) find a positive and significant association between non-audit fees and the magnitude of the absolute value of discretionary accruals. Their findings imply that auditors compromised their independence due to a large portion of non-audit fees received from their audit clients. Gore et al. (2001) document the same results as Frankel' et al. (2002) for non-Big 4 but not for Big 4 audit firms.[45] In other words, they suggest that smaller firms are more likely to compromise their independence than larger audit firms. Antle, Gordon, Narayanamoorthy and Zhou (2002) investigate the relations among audit fees, non-audit fees, and discretionary accruals in a simultaneous equations model. After simultaneously estimating the determinants of audit fees, non-audit fees, and discretionary accruals, they find negative and significant association between non-audit fees and discretionary accruals. Using the same data sets and methodology as Frankel's et al. (2002), Ashbaugh, LaFond and Mayhew (2003) report that earnings management is positively and significantly associated with the purchase of non-audit services. However, after adjusting for firm performance, they fail to find any evidence of a relationship between the provision of non-audit fees and the magnitude of earnings management. Finally, both Chung and Kallapur (2003) and Reynolds, Deis and Francis (2004) find no association between measures of auditor independence and measures of earnings management. Whilst the empirical literature is mixed, this study adopts the costly contracting

[45] Previous studies use the term 'Big-5', 'Big-6' or 'Big-8' to indicate the big size international accounting firms. Those firms now have merged into four. Therefore, the term 'Big-4' is used in this study to refer all the top tier large size international accounting firms.

theory and auditing literature. Thus, the study tests the following hypothesis:

H_1: There is an inverse relationship between auditor independence and the magnitude of earnings management.

3.2. Auditor quality and earnings management

Watts and Zimmerman (1986) and DeAngelo (1981) remark that auditor quality depends on the relevance of the auditor's report in examining contractual relationships and reporting on breaches. Becker et al. (1998) argue that high quality auditors are expected to be more likely to detect the practice of earnings management. In other words, Bartov et al. (2001) suggest that higher quality auditors prefer to report errors and irregularities and are unwilling to accept questionable accounting practices. Specialist auditors are likely to invest more in staff recruitment and training, information technology, and state-of-the art audit technologies than non-specialist auditors (Dopuch and Simunic 1982). As a result, industry specialist auditors are expected to exhibit superior performance in a specific industry (Solomon, Shields, and Whittington 1999; Owhoso, Messier, and Lynch 2002).

Previous studies regarding auditor industry specialisation and earnings management fail to reach a consensus that specialist auditors produce more effective audits than non-specialist auditors; therefore they are less likely to allow management to manage reported earnings. Zhou and Elder (2001), for example, indicate that specialist auditors lower earnings management in the initial public offerings (IPO) process. Balsam et al. (2003) examine the effect of auditor specialisation on the absolute level of discretionary accruals and earnings response coefficients. They report that clients of industry specialist auditors' have lower discretionary accruals and higher earnings response coefficients than clients of non-specialist auditors. In addition, Krishnan (2003b) and Kanagaretnam, Lim and Lobo (2010) finds evidence consistent with the argument that specialist auditors mitigate the practices of earnings management more than non-specialist auditors. However, using the sample of 367 Taiwan IPO companies in 1999-2002, Chen, Lin and Zhou (2005) fail to find any evidence that specialist audit firms perform a superior audit than non-specialist audit firms. Meanwhile, Jenkins, Kane and Velury (2006) reveal that industry specialist auditors are only partially effective in detecting and constraining the magnitude of earnings management. Following the previous empirical findings, it is expected that specialist auditors perform higher quality audits than non-specialist auditors, thereby, decreasing earnings management. Thus, the second hypothesis is:

H_2: There is a negative association between the level of auditor quality and the level of earnings management.

4. Researh design

4.1. Sample selection

The Singaporean data comprises the entire population of the 551 firms listed on the two principal listing boards (denoted Mainboard (413) and Sesdaq (138), respectively) of the SGX as at 31 December, 2003. Of 551 firms in the initial population, only 521 annual reports can be collected. In contrast with the Singaporean data, the initial Australian sample consists of 450 firms listed on the ASX for the financial year ending on 30 June 2004. Annual reports are randomly collected from Aspect Huntley DatAnalysis database. The Datastream and Connect 4 databases are also used to obtain the market capitalisation and other information when they are not available in the Aspect Huntley DatAnalysis database.

This study focuses on Singaporean (Australian) incorporated entities listed on the SGX (ASX); thus, 63 (10) firms incorporated outside of Singaporean (Australian) are excluded from sample. Consistent with prior research, this study then eliminated 11 (31) of Singaporean (Australian) firms from the finance sector that includes bank, insurance, unit trusts and finance firms. Companies in the finance sector are subject to different regulatory requirements that could unduly affect discretionary accruals and the audit fees paid. Mayhew & Wilkins (2003) report that audit fees paid in the first year of a firm's listing may significantly differ from normal business operation years. Consequently, 55 (30) of Singaporean (Australian) IPO firms during the investigation calendar year are excluded from the sample.

To create industry classifications for the data sets, this study uses the two-digit US Standard Industry Classification (SIC). This classification is applied to the US context that has a significantly larger number of listed companies compared to both Singapore and Australia capital market.[46] Therefore, to drive a smaller set of industry groupings, this study uses broader industry categories based on a major division structure of the US SIC. Following other research (e.g., Hogan and Jeter 1999; Krishnan 2003b; Mayhew and Wilkins 2003), this study eliminated 12 of Singaporean firms from industry sectors with less than 10 observations. Audit fee information could not be collected from 49 of Singaporean annual reports due to insufficient disclosure. Data to construct proxy measures for the dependent,

[46] US has approximately 10,000 companies in the Compustat database and 72 unique two-digits SICs (Francis, Reichelt, and Wang 2005).

independent and control variables were obtained directly from collected annual reports or, where data was unavailable, reputable databases such as Datastream, Connect 4 and Compustat International. However, the study is unable to collect sufficient information to construct a full set of proxy measures for 24 (49) of Singaporean (Australian) entities, respectively. Finally, to control for extreme observations, this study excluded four (18) outliers from Singaporean (Australian) data, respectively (>4 standard deviations from the mean absolute discretionary accruals).[47] For purposes of statistical analysis, therefore, it is left with a final usable sample of 303 (312) of Singaporean (Australian) firms. Table 1 summarises the sample selection process.

[Table 1 about here]

4.2. Proxy for earnings management, auditor independence and auditor quality

Prior to estimating discretionary accruals, total accruals (*TAC*) are calculated as:

[47] The statistical tests are not influenced by the retention or removal of outliers. However, the explanatory power of models tested is lower if the influential data points are retained.

$$TAC_{jt} = (\Delta CA_{jt} - \Delta Cash_{jt}) - (\Delta CL_{jt} - \Delta LTD_{jt} - \Delta ITP_{jt}) - DPA_{jt} \quad \{1\}$$

Where: TAC_{jt} = total accruals for firm *j* in time period *t*; ΔCA_{jt} = change current assets for firm *j* from time period *t-1* to *t*;
$\Delta Cash_{jt}$ = change cash balance for firm *j* from time period *t-1* to *t*; ΔCL_{jt} = change current liabilities for firm *j* from time period *t-1* to *t*; ΔLTD_{jt} = change long-term debt included in current liabilities for firm *k* from time period *t-1* to *t*; ΔITP_{jt} = change income tax payable for firm *j* from time period *t-1* to *t*; and DPA_{jt} = depreciation & amortization expense for firm *j* from time period to *t*.
TAC then is decomposed into normal accruals (*NAC*) and discretionary accruals (*DAC*) using the cross-sectional *modified* Jones (1991) model defined formally as:

$$TAC_{jk,t} / TA_{jk,t-1} = \alpha_{jt} [1/ TA_{jk,t-1}] + \beta_{jt} [(\Delta REV_{jk,t} - \Delta REC_{jk,t})/ TA_{jk,t-1}] + \gamma_{j,t} [PPE_{jk,t} / TA_{jk,t-1}] + \varepsilon_{jk,t} \quad \{2\}$$

Where: $TAC_{jk,t}$ = total accruals for firm *j* in industry *k* in year *t;* $TA_{jk,t-1}$ = are total assets for firm *j* in industry *k* at the end of year *t-1*; $\Delta REV_{jk,t}$ = change net sales for firm *j* in industry *k* between years *t-1* and *t*; $\Delta REC_{jk,t}$ = change in receivables for firm *j* in industry *k* between years *t-1* and *t*; $PPE_{jk,t}$ = gross property, plant and equipment for firm *j* in industry *k* in the year *t*; α_j, β_j, γ_j = industry specific estimated coefficients; and ε_j = error term.

NAC is defined as the fitted values from *Eq. 2* whilst *DAC* is the residual (*TAC* minus *NAC*).

Following past studies, this study uses the ratio of non-audit fees to total fees received by an accounting firm from an audit client as a proxy for auditor independence (Scheiner 1984; Firth 1997b; Gore et al. 2001; Frankel et al. 2002; Larcker and Richardson 2004; Lin and Hwang 2010). This measurement is also consistent with the Securities and Exchange Commission's (SEC's) position in assessing auditor independence (SEC 2000, Section III. C. 5). Consistent with Hogan & Jeter (1999), this study uses auditor specialisation (in term of auditor industry market share) as a proxy for auditor quality.[48] Auditor market share is a portion of audit fees earned by an audit firm in certain industry relative to total audit fees earned by all audit firms in that particular industry.

4.3. Control variable proxies

To control for compounding influences of cross-sectional factors, this study includes control variables in the regression analysis. Consistent with Becker et al. (1998); Francis, Reichelt & Wang (2005); Davidson et al. (2005); and Wahab, Zain, James and Haron (2009), this study includes firm size (*FSize*) as prior studies indicated that litigation risk is greater for larger clients than for smaller size clients (Lys and Watts 1994; Heninger 2001). This study includes the absolute value of total accruals (*ABSTAccruals*) to control for a firm's 'accrual-generating potential' (Becker et al. 1998). This variable is included as firms with higher absolute values of total accruals are likely to have greater discretionary accruals (Krishnan 2003b). *Leverage* is included as prior studies show that firms with a higher likelihood of violating debt agreements are more likely to have an incentive to engage in earnings management to increase earnings (e.g., Healy and Palepu 1990; Press and Weintrop 1990; DeFond and Jiambalvo 1994; Sweeney 1994; Mather and Ramsay 2006). Previous research (e.g., Dechow, Sloan, and Sweeney 1995; Frankel et al. 2002; Kothari, Leone, and Wasley 2002; Hutchinson, Percy, and Erkurtoglu 2008; Demirkan and Platt 2009) reports discretionary accruals is dependent on a firm's financial performance. This is because financial performance may affect corporate management's opportunistic window and incentives for managing earnings. Furthermore, financial performance may influence a firm's audit risk (e.g., Gul, Chen, and Tsui 2003; Krishnan 2003b). *ROI* and *Losses* are utilised to control for the possible compounding influences of a firm's financial performance. The perceived quality of the auditor is also considered to be a possible determinant of the magnitude of earnings management (e.g., Frankel et al. 2002; Gul et al. 2003). Prior research usually distinguishes between non Big-4 and Big-4 audit firms arguing the latter to be of a higher quality than the former (Heninger 2001; Mayhew and Wilkins 2003). This study includes *Big-4* as a control for perceived auditor quality. To control for any mitigating effects of ownership structure, the high ownership concentration (*OwnCon%)* is included. Becker et al. (1998) and Reynolds & Francis (2001) report cash flow from operations influences corporate management actions in managing earnings. Thus, a control variable of *CashFlowOp* is incorporated to control for discretionary accruals dependence on cash flow from operations. Additionally,

[48] Some studies (e.g., Craswell et al. 1995; Francis, Stokes, and Anderson 1999b; Hogan and Jeter 1999; Abbott and Parker 2000; DeFond et al. 2000; Chen, Moroney, and Houghton 2005) have used auditor industry specialisation as a measure for auditor quality.

researchers such as Skinner & Sloan (2002) and Chung & Kallapur (2003) show that growth firms have a greater incentive to engage in earnings management. Following these researches, the regression model includes the market-to-book ratio (*MV*) as a control for the affects of a firm's growth pattern on the behaviour of corporate management to manage earnings. Finally, Ma (1997) documents that accounting practices in the Asia Pacific region vary between countries, therefore, this study explores if the country variable (*Country*) affect various accounting decisions and choices including managers' tendencies to manage accounting earnings. Proxy measures for the dependent, independent and control variables are defined in Table 2.

[Table 2 about here]

4.4. Empirical model equations

This study uses OLS multiple regressions as the main statistical technique to test the hypotheses. The main regression models are defined in the following equations:

Equation 1: $AbsDAC_i = a_i + \gamma_{i1}\, NonAuditRatio_i + \alpha_{i1}\, FSize_i + \alpha_{i2}\, ABSTAccurals_i + \alpha_{i3}\, Leverage_i + \alpha_{i4} ROI_i + \alpha_{i5} Big\text{-}4_i + \alpha_{i6} Losses_i + \alpha_{i7}\, CashFlowOp_i + \alpha_{i8}\, OwnCon\%_i + \alpha_{i9} MV_i + \alpha_{i10} Country_i + \varepsilon_i$

Equation 2: $AbsDAC_i = a_i + \gamma_{i2}\, Specialist_i + \alpha_{i1}\, FSize_i + \alpha_{i2}\, ABSTAccurals_i + \alpha_{i3}\, Leverage_i + \alpha_{i4} ROI_i + \alpha_{i5} Big\text{-}4_i + \alpha_{i6} Losses_i + \alpha_{i7}\, CashFlowOp_i + \alpha_{i8}\, OwnCon\%_i + \alpha_{i9} MV_i + \alpha_{i10}\, Country_i + \varepsilon_i$

Equation 3: $AbsDAC_i = a_i + \gamma_{i1}\, NonAuditRatio_i + \gamma_{i2}\, Specialist_i + \alpha_{i1}\, FSize_i + \alpha_{i2}\, ABSTAccurals_i + \alpha_{i3}\, Leverage_i + \alpha_{i4} ROI_i + \alpha_{i5} Big\text{-}4_i + \alpha_{i6} Losses_i + \alpha_{i7}\, CashFlowOp_i + \alpha_{i8}\, OwnCon\%_i + \alpha_{i9} MV_i + \alpha_{i10} Country_i + \varepsilon_i$

Equation 1 and Equation 2 test the association of auditor independence (*NonAuditRatio*) and auditor quality (*Specialist*) to the earnings management (*AbsDAC*) in isolation. Equation 3, meanwhile, considers the effects of both *NonAuditRatio* and *Specialist* together.

5. STATISTICAL RESULTS

5.1 Descriptive statistics of auditor independence

Table 3 reports the composition of total fees paid by Singaporean and Australian listed firms' breakdown by the USSIC and the Big-4 and Non Big-4 accounting firms.

[Table 3 about here]

Table 3, Panel A, shows that firms belonging to the *Transportation, Communication, Electric, Gas & Sanitary Services* sector paid, on average, the highest amount of total fees (AUD$345,945), audit fees (AUD$208,383) and non-audit fees (AUD$137,561). On average, total audit fees earned by both Singaporean and Australian accounting firms from their capital market in the sample year is AUD$147,446 or 65.02% of total fees.

Proportionately, sample firms in the *Transportation, Communication, Electric, Gas & Sanitary Services* and *Mining* sectors purchase the highest relative level of non-audit services to total fees (39.76% and 41.50%, respectively) from their incumbent auditor. In contrast, firms in the *Agriculture, Forestry & Fishing* and *Wholesale Trade* sectors purchase the lowest relative levels of non-audit services (23.19% and 31.24%, respectively). It is noted, however, that audit fees remain the largest component (65.02%) of total fees of a Singaporean and Australian audit firm's revenue stream.[49] This figure is significantly larger than the composition of audit fees received by audit firms in the U.S., which is 51.00% (Frankel et al. 2002) and U.K., which is 51.17% (Ferguson et al. 2004).

Panel B of Table 3 indicates that KPMG earned the largest amount of non-audit (AUD$153,589) and, total fees (AUD$396,020) from the Singaporean and Australian capital markets. These amounts are almost twice as much as the sample means of all firms. In term of audit fees, PWC earned the largest portion (AUD$249,100) amongst their counterparts. Again, this figure is nearly twice as much as the average amount of audit fees received by the all firms. On the other hand, DT received the smallest amount of audit (AUD$111,978), non-audit (AUD$44,695) and total fees (AUD$156,674) from the Singaporean and Australian listed clients amongst other Big-4 firms. For non-audit fees, EY received a relatively larger portion (39.30%) than other accounting firms.[50] Total fees (audit and non-audit fees) paid by both Singaporean and Australian listed companies to the Big-4 accounting firms, on average, are much higher (AUD$1,115,300 or 94.49%) than total fees paid to the Non Big-4 accounting firms (AUD$67,327 or 5.51%). In

[49] 20.81% (128 out of 615 firms) of the sample did not purchase any non-audit services from their incumbent auditor.

[50] The higher the level of non-audit fees that auditors receive from their clients, the more incentives they will have to agree with the client' accounting choices.

addition, average amount of non-audit fees earned by the Big-4 accounting firms (96.55%) was much higher than average amount of non-audit fees earned by the Non Big-4 firms (3.45%).

5.2 Descriptive statistics of auditor quality

Table 4 depicts the Singaporean and Australian audit firm market share by the USSIC schema. Audit firms with an audit fee market share 20% or more in a certain industry sector are considered as a specialist in that particular industry. Moreover, in calculating an audit firm's industry market share, it assumes one common market in these two (Singapore and Australian) countries.[51] Table 4 also summaries the proportion of firms in a given industry that used the services of a specialist auditor.

[Table 4 about here]

Table 4 shows that EY is the biggest audit service provider in Singaporean and Australian capital market with a 32.54% market share. Based on the number of clients, the Big-4 firms audit 72.36% (445 out of 615) of listed companies in both Singapore and Australia. The details of auditors' industry specialisation in Table 4 show that PWC, KPMG and EY are specialist auditors in five, four and eight industry sectors respectively,[52] while, DT is not an expert in any other industry sectors. In terms of market leader per industry (defined as Big-4 audit firm with largest market share in a given industry), PWC is the lead audit provider in three industry sectors (*Mining, Transportation, Communication, Electric, Gas & Sanitary Services* and *Commercial)*. KPMG is the dominant audit provider in the *Construction* industry. Moreover, EY is a leader in five industry sectors (*Agriculture, Forestry and Fishing, Manufacturing, Whole Trade, Retail Trade* and *Services industry sectors*).

Of the 445 Big-4 clients, only 319 firms (or 51.87%) use a specialist auditor. There is evidence that Big audit firms (e.g., DeAngelo 1981; Becker et al. 1998; Francis, Maydew, and Sparks 1999a) and specialist auditors (e.g., Reynolds and Francis 2001; Balsam et al. 2003; Krishnan 2003b) provide higher quality audits than their counterparts.

Firms in the *Transportation, Communication, Electric, Gas & Sanitary Services* and *Commercial* sectors appear to use the services of a limited number of audit firms. Approximately 67.16% and 85.71% of firms in each of these industries use specialist auditor services. The *Construction* and *Mining* industry sectors are less dominated by firms engaging the services of a specialist auditor (16.67% and 26.39%, respectively). Interestingly, while paid the second highest amount of audit fees, firms in the *Construction* industry sector use minimal services of specialist auditors.[53]

5.3 Descriptive statistics of dependent and control variables

Table 5 provides the descriptive statistics for the study's dependent and control variables.

[Table 5 about here]

Table 5 indicates that average discretionary accruals are -0.27% of the beginning balance of total assets. This value is slightly lower than reported in Bhattacharya, Daouk & Welker (2003) and Leuz, Nanda & Wysocki (2003). However, the number of firms that have positive and negative discretionary accruals is about equal (319 and 296 firms, respectively). The approximately equal percentage of positive and negative discretionary accruals firms is consistent with other research (e.g., Klein 2002).

In regard to the control variables, Table 5 indicates that the average firm total assets in the sample year is AUD$427,897,000. The average absolute value of total accruals (*ABSTAccruals*) is 15.46% of total assets at the beginning of the year. Average long-term debt to total assets ratio (*Leverage*) of the sample firms is 12.36%. In terms of ownership concentration (*OwnCon%),* 69.73% of the equity shares of the sample firms are held by the top twenty shareholders. Average ROI and cash flow from operations (*CashFlowOp*), scaled by the beginning total assets, are negative (-4.02% and -2.08%, respectively). The poor financial performance as evidenced by 59.19% (364 out of 615) of the sample firms reporting a loss in the past three years suggests that firms experienced financial hardship during those fiscal periods. Such performance might be affected by deteriorating

[51] However, this study also uses industry specialist figures from each country (Singapore and Australia) to control for possible systematic auditor industry specialisation differences in the earnings management measure.

[52] PWC is a specialist auditor in the *Mining, Transportation, Communication, Electric, Gas & Sanitary Services, Whole Trade,Commercial,*and *Services industry sectors*. KPMG is an expertise in the *Construction, Manufacturing, Transportation, Communication, Electric, Gas & Sanitary Services* and *Commercial*. While, EY specialises in the *Agriculture, Forestry and Fishing, Mining, Manufacturing, Transportation, Comunication, Electric, Gas & Sanitary Services, Whole Trade, Retail Trade, Commercial* and *Services industry sectors*.

[53] As shown in Table 5, a specialist auditor in the *Construction* industry sector is KPMG. Even though this audit firm has earned the largest amount (47.96%) of industry market share, this is based on just four out of 24 clients (16.67%) in the *Construction* industry sector.

world economic conditions due to the Asian financial crisis from 1997 to 1998 and the SARS epidemic in 2001-2002 (Teo 2003; Conyon 2004; Mak and Kusnadi 2005). The Big-4 accounting firms audit almost three fourth of the total Singaporean and Australian listed firms in the sample year. Additionally, the average market-to-book value (*MV*) of the sample firms is around 1.74 times. Finally, Table 5 shows that Singaporean companies make up 49.27% (303 out of 615) of the sample, while 50.73% (312 out of 615) are Australian companies.

5.4 Correlations matrix

The correlation results (for brevity, the correlation table is not included) do not provide comprehensive support for the study's hypotheses. *AbsDAC* is negatively insignificantly correlated with *NonAuditRatio* both for Pearson and Spearman correlations. Correlations between *AbsDAC* and *Specialist* (both Pearson or cr_p and Spearman or cr_s) are positive and significant at $p<0.01$. The dependent variable is significantly associated with several of the control variables: (a) *ABSTAccurals*, *Losses* and *MV*. These coefficients are positive and significant at $p<0.01$ both in cr_p and cr_s; (b) *FSize*, *ROI*, *Big-4*, *OwnCon%* and *Country*. These coefficients are negatively and significantly at $p<0.01$ whether in cr_p or cr_s; (c) *CashFlowOp*, which is positive and significant at $p<0.01$ in cr_s. Findings also show a significant positive correlation ($p<0.01$ cr_p and cr_s) between *NonAuditRatio* and *Specialist*. As the correlation value is below the critical limits of 0.80 (Hair, Anderson, Tatham, and Black 1995; Greene 1999; Cooper and Schindler 2003) it is suggested that a multicollinearity problem between independent variables is not a serious concern. In respect to correlations between independent and control variables, and amongst control variables themselves, the highest correlations are between *ROI* and *CashFlowOp*, with a coefficient of -0.690 ($p<0.01$ cr_s). This value is, again, below the critical limit of 0.80.[54] Variance inflation factors calculated for all regressions reported in Tables 6 to 9 for all independent and control variables provide further indications that multicollinearity is not a problem in the model estimations (Hair et al. 1995; Greene 1999; Cooper and Schindler 2003).

5.5 Multivariate main results

The main results for testing hypotheses are reported in Table 6. Equation 1 (Panel A) and Equation 2 (Panel B) test the association of auditor independence (*NonAuditRatio*) and auditor quality (*Specialist*) to the dependent variable in isolation. Equation 3 considers the effects of both *NonAuditRatio* and *Specialist* in conjunction.

[Table 6 about here]

Regression model estimates reported in Table 6, Panels A, B and C, are all statistically significant (F-statistic $p<0.01$). The model in Table 6, Panel A (29.50%), explains the most variance in the dependent variable and that for Table 6, Panel B (30.10%), the least. The directional sign on the coefficients for *NonAuditRatio* are negative in both Panels A and C. This is consistent with direction predicted in the study's hypothesis. The negative sign on *NonAuditRatio* implies that the larger portion of non-audit fees that auditors receive from audit clients the less likely they compromise their independence. However, the coefficients on *NonAuditRatio* are statistically insignificant.[55] Therefore, the results do not support the H_1. The findings of no relationship between non-audit fees and the measures of earnings management is consistent with some prior studies (e.g., Chung and Kallapur 2003; Reynolds et al. 2004). Consistent with the second hypothesis, suggesting that the magnitude of earnings management is significantly lower amongst firms engaging a specialist audit firm relative to those using the audit services of a non-specialist, the coefficients on *Specialist* in Panel B and Panel C are all negative and significant at $p<0.05$. Therefore, the results support the acceptance of H_2.[56]

In respect to control variables, the coefficients on *ABSTAccruals* are positive and significant ($p<0.01$) across all regression models. This finding is consistent with prior research (e.g., Frankel et al. 2002; Ashbaugh et al. 2003; Balsam et al. 2003).

[54] As a further check for multicollinearity this study performs the model estimations reported in Tables 6 to 9 again after first excluding *ROI* and then *CashFlowOp*. The independent exclusion of each respective control variable does not significantly alter the findings reported in the main result.

[55] This study also re-performs the tests in Panels A and C (based on the Equations 1 and 3) after dropping companies that have not purchased any non-audit services from their incumbent auditors. These results are qualitatively the same as those reported in Table 6.

[56] To control for possible systematic auditor industry specialisation differences in the earnings management measure, this study repeats previous analysis by using industry specialist figures from each country into each of the three regression models. For example, auditor industry specialisation for Singapore's audit firms are calculated based on at least 20% of an audit fee market share that they earned from a certain industry sector in the Singapore's capital market. After running the three previous regression models, there are no qualitative changes for independent or control variables in any of these three regressions.

Consistent with the prediction signs in this study, the coefficients on *ROI (Loss)* variables are all negative (positive) in Panels A, B and C. These coefficients are statistically significant at p<0.01. These results confirm the argument that the higher *ROI* or the lower *Loss* associates with the less incentives of earnings management (Dechow et al. 1995; Frankel et al. 2002; Kothari et al. 2002). In addition, the coefficients on *CashFlowOp* are all negatively and significantly (p<0.01) associated with the measure of earnings management. These results are consistent with Dechow, Sloan & Sweeney (1995) and Peasnell, Pope & Young (2000) who suggest a negative relationship between cash flow from operations and earnings management. The coefficients on *Country* are negative and significant in all models (Panel A to Panel C) suggesting that *Country* as a significant factor that influences corporate management's opportunistic window and incentives for managing reported earnings (Ma 1997). Directional signs on the coefficients for *Leverage* and *OwnCon%* contradict with previous works (e.g., Burgstahler and Dichev 1997; Davidson et al. 2005), but the negative sign on the coefficient for *Leverage* is consistent with Frankel et al. (2002). However, these coefficients are not significant. The directional sign on the coefficients for *Big-4* is negative in Panel A, but positive in the rest two panels (Panel B and Panel C). The positive association between *Big-4* variable and earnings management measurement is inconsistent with previous studies (Becker et al. 1998; Francis et al. 1999a; Krishnan 2003a; Francis et al. 2005). However, these coefficients are not significant. Moreover, directional signs on the coefficients of remaining control variables are generally consistent with prior related research (Peasnell et al. 2000; e.g., Davidson et al. 2005; Francis et al. 2005). Again, all coefficients are insignificant.

5.6 Multivariate results for partitioned sub-samples

The univariate analysis results of variance (for brevity, the table is not included) indicate that the mean of absolute discretionary accruals for the audit firm size, client firm performance and country variable sub-samples are statistically and significantly different at a p<0.01. Consequently, this section provides the regression results showing the influence of audit firm size, client firm performance and country on the relationship between earnings management and the two auditor values (auditor independence and quality). All equations are performed as presented in Table 6. For brevity, this study only reports findings of multivariate results for partitioned sub-samples based on Equation 3. Findings based on the other equations (Equation 1 and Equation 2) are reflective of those reported in Tables 7 to 9.

5.6.1 Audit firm size

Table 7 reports regression results by partitioned the sample firms based on audit firm size.[57]

[Table 7 about here]

Separating the pooled sample into Non Big-4 and Big-4 accounting firms primarily focuses on the relationship between auditor independence (*NonAuditRatio)* and the level of earnings management. The Big-4 audit firms dominate industry specialisations. None of Non Big-4 firms is considered as a specialist auditor in any particular industry (nine of USSIC industry sectors as shown in Table 4); therefore, auditor quality is not a concern in these partitioning sub-samples. As shown in Table 7, the results of regressions in both Non Big-4 and Big-4 sub-samples for *NonAuditRatio* are consistent with the inferences of the main results presented in Table 6. Specifically, the directional sign on the coefficients for *NonAuditRatio* is negative but not significant in both sub-samples. The results for the control variables in the Non Big-4 sub-sample are generally the same as those reported in Table 6, except for *FSize*, *OwnCon%* and *Country*. The direction on the coefficient for *FSize* (*OwnCon%)* are positive (negative), respectively. However, these coefficients are statistically not significant. In addition, even though the coefficient on *Country* in the Non Big-4 sub-sample is negative (same to the main results); it is statistically not significant. One anomaly with the results of the control variables in the Big-4 partitioned sub-sample compared to the main findings is *MV*. The directional sign on the coefficient for *MV* is negative; however, it is not significant.

5.6.2 Client firm performance

Table 8 provides regression results for partitioning sample firms based on whether the client firm prepared a profit (good performance) or a loss (poor performance) in last three years in its financial statements.

[Table 8 about here]

As shown in Table 8, a negative sign of the coefficient on the *NonAuditRatio* in the poor performing firm categorisation is consistent with the main results tabulated in Table 6. A positive sign on the coefficient on the *NonAuditRatio* for

[57] Following DeAngelo (1981), Davidson & Neu (1993) and Becker *et al*. (1998), this study categories the Big-4 as large audit firms.

good performing firms infers that a higher proportion of non-audit fees pose greater threats to auditor independence in reducing the level of earnings management in that category firms. However, the coefficients on the *NonAuditRatio* for both sub-samples are statistically not significant. The coefficients on the *Specialist* in poor and good performing firms are both negative but only moderately significant ($p<0.10$) in poor performance firms. The significant negative association between *Specialist* and the magnitude of earnings management is in line with the initial findings reported in Table 6. It is noted that the results of regression for control variables in the poor client performance sub-sample are generally consistent with the main results, except for *FSize, OwnCon%* and *MV* variables. Contrary to the main results, the coefficients on *FSize, OwnCon%* and *MV* in the poor performance firms are positive, negative and negative, respectively. In addition, unlike the results of the good performance firms, the coefficients on *ROI, CashFlowOp* and *Country* are not significant as reported in Table 6; however, the coefficient on *Leverage* is positively and significantly at $p<0.10$.

5.6.3 Country

Table 9 shows regression results by partitioning the pooled sample into Singaporean and Australian firm categories.

[Table 9 about here]

The coefficients on *NonAuditRatio* for both Australian and Singaporean firm classifications are the same as those presented in Table 6. Separating estimations for *Specialist* categorisation into Australian and Singaporean sub-samples does not provide comprehensive support for the initial findings in Table 6. The coefficients on *Specialist* are all negative in both sub-samples but only significant at $p<0.05$ in Singaporean firm classification. This infers that *Country* is considered as an important factor in influencing audit firm performance. The regression results for the control variables in Australian sub-sample are consistent with the main findings reported in Table 6. In the Singaporean sub-sample, three control variables are somewhat inconsistent with the initial results, *FSize, Losses* and *MV*. The directional signs on the coefficients for *FSize* (*MV*) are positive (negative); however, these coefficients are not significant. Although the coefficient on *Losses* in the Singaporean sub-sample is the same as the main findings; but, it is not statistically significant.

5.7 Additional sensitivity and robustness checks

Apart from partitioning the pooled sample, I perform additional sensitivity and robustness checks to further ensure the inferences drawn thus far are valid. First, whilst the use of the *modified* Jones (1991) model is widely cited in the literature its application is not free from criticism (Dechow et al. 1995; Guay, Kothari, and Watts 1996; Koerniadi and Tourani-Rad 2008). Thus, I estimated discretionary accruals again using alternative techniques including: (a) the original specified Jones (1991) model; (b) inclusion (in separate estimations) to the *modified* Jones (1991) model of (i) cash flow operating activities (Dechow 1994; Kim, Chung, and Firth 2003) and (ii) return on assets (Ashbaugh et al. 2003; Kothari, Leone, and Wasley 2005). All findings from use of alternative discretionary accrual model estimates do not facilitate any significant qualitative change in results as reported in Table 6. A point of note, however, is that the explanatory of the additional regressions tend to be lower when the model estimation of discretionary accruals is more restrictive (i.e., includes more variables to such as cash flow from operations) that may be associated with total accruals.

Second, as noted above, the ratio of non-audit service fee to total fees is extensively utilised in the research literature to proxy for auditor independence impairment (e.g., Parkash and Venable 1993; Firth 1997a; Frankel et al. 2002). Application of this proxy is consistent with results of the Earnscliffe Research and Communications (1999) survey that finds there is a perception that auditor independence is impaired when the amount of non-audit fees is large relative to audit fees. The non-audit/total fee ratio, however, is not free of criticism such as failing to capture client importance. Following Frankel et al. (2002), I construct several alternative measures of auditor independence including: (a) percentile rank of non-audit, audit and total fees by auditor; (b) logarithm transformation of audit and non-audit fees; and (c) ratio of non-audit fees to audit fees. Tests based on Equations 1 to 3 performed using these alternative proxies for auditor independence generally yields consistent results with Table 6 results. One difference of note, however, is that when using the percentile rank of non-audit fees by auditor the coefficients are moderately positively significant. Whilst findings using the percentile rank of non-audit fee by auditor are not entirely definitive the results may suggest the auditor's ability to detect and constrain earnings management is reduced when independence is impaired but in cases where the client's importance to the auditor is high.

Third, whilst I follow prior literature (e.g., Pearson and Trompeter 1994; Craswell et al. 1995;

DeFond et al. 2000; Ferguson and Stokes 2002) in using an arbitrary threshold to denote market share and subsequently industry specialisation this approach is not free of criticism. To determine if auditor specialisation finding this study is not driven by the arbitrarily applied cut off threshold of 20%, I use alternative benchmarks of 10, 15, and 25%. Regardless of whether I tighten or loosen the cut off threshold the coefficients on *Specialist* in additional sensitivity tests are consistent with Table 6 results. The findings infer Table 6 findings are not driven by the selection of a cut off threshold. In an additional test, I follow the recent derived approach of Ferguson et al. (2003) where industry rankings based on market shares within each industry to denote industry specialisation. Again, tests using this second alternative proxy for auditor specialisation yield consistent results with Table 6 findings.

6. Conclusion

This study finds no empirical evidence that auditor independence amongst listed firms in Singapore and Australia is associated with earnings management. This result is consistent with Chung & Kallapur (2003) and Reynolds et al. (2004) but contrary to some previous studies (e.g., Frankel et al. 2002; Ferguson et al. 2004). In addition, this study documents a significant negative relationship between auditor quality and the magnitude of earnings management. This finding provides support for H_2. Therefore, in line with previous studies (e.g., Reynolds and Francis 2001; Balsam et al. 2003; Krishnan 2003b), this study adds further evidence that specialist auditors provide better quality audit than non-specialist auditors.

This study then separately considered instances where: (1) the accounting firms are PWC, KPMG, EY or DT (Big-4 accounting firms) or Non Big-4, (2) the client firm performances are poor or good and (3) the client firms are Australian or Singaporean firms. The regression results on the *NonAuditRatio* for these three category sub-samples are generally similar to the main findings. The differences are only for good performance firm sub-sample. The directional sign on the coefficients for *NonAuditRatio* in these categories sample is positive; however, these coefficients are statistically not significant. However, further evidence from sub-sample regressions indicates that the association between auditor specialisation and earnings management is negative and significant for the poor client performance and Singaporean firms. Overall, empirical evidence from Singaporean and Australian data set (1) does not support the proposition that the purchase of non-audit services may or may not reduce auditor independence, however, (2) add further evidence that specialist auditors produce better quality audit than non-specialist auditors do.

These findings have various implications for policy makers, corporate management, corporate governance reformists, investors and scholarly researchers alike. For example, there currently appears to be a preoccupation amongst corporate governance reformists and policy makers internationally to curb the provision of non-audit services by the incumbent auditor to aid in such matters as the reduction in earnings management. This study suggests this preoccupation may be misplaced and that constraining the ability of firms to purchase non-audit services from the incumbent auditor could provide only limited benefits whilst increasing costs (such as any discount offered by the incumbent auditor resulting from cost savings achieved through knowledge spillover effects). This study provides stronger support for allowing the audit market to operate in a basic *lassez-faire* manner without any overbearing interference by policy makers. Restricting incumbent auditors to provide non-audit services may eliminate audit firms' abilities to gain economies of scale (Antle & Demski, 1991). In addition, the joint supply of audit and non-audit services is considered to enhance audit quality due to it improves the auditors' knowledge of the client's operation (Houghton & Jubb, 2002; Ruddock & Taylor, 2005). Therefore, the results imply that recent actions of Australian and Singaporean policymakers to strengthen rules governing audit independence in respect to non-audit services may have been premature.

In addition, due to competitive pressure, audit firms have 'naturally' realigned their organizational structure along industry lines; thus, promoting greater development of industry specialisation. One implication of this study results is that this 'natural' progression has ultimately enabled better streamlining of the audit firm such that the ability to detect and constrain earnings management is enhanced. Given industry specialisation is likely to play an increasingly important role in audit value in the future (Hogan and Jeter 1999; Solomon et al. 1999) moves by policy makers and reformists to contract industry specialisation should, based on these findings and other recent research (Balsam et al. 2003; Krishnan 2003a), be encouraged.

Whilst this study has attempted to maintain the integrity of research method supported by various sensitivity and robustness checks, like any other empirical investigation, this study is not without certain caveats. Earnings management and auditor independence are unobservable so we rely on proxy measures that, whilst previously used in the research literature, are not free of criticism. For instance, discretionary accrual models measure discretionary accruals with error (see Bernard & Skinner, 1996 for a deeper discussion). These problems, however, are endemic to the earnings

management literature and this study uses the best currently available models and proxies. Future studies can seek to focus on refinements to the proxy measures for dependent and independent variables.

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Table 1. Sample selection process

Description of selection process:	**Singapore**	**Australia**
Initial population (sample) of Singaporean (Australian) listed firms	551	450
Less: Firms listed on SGX that did not issue annual report during 2003 calendar period	20	-
Singaporean firms producing 2003 calendar year annual reports BUT which could not be collected	10	-
Foreign incorporated firms listed on SGX (ASX) as at 31 December 2003 (30 June 2004)	63	10
Banks, insurance, unit trusts & finance firms, listed on SGX (ASX) as at 31 December 2003 (30 June 2004)	11	31
Firms that were IPOs during the investigated calendar year	55	30
Firms from industries with less than ten observations	12	-
Firms disclosing non-audit fees but not audit fee data	49	-
Firms with insufficient information for which to construct all proxy measures	24	49
Outliers	4	18
Final sample used	**303**	**312**

Table 2. Variable definition and description

Variable Description	**Variable Title**
Dependent Variable	
Absolute *DACs* firm *i* for year *t* measured by Modified Jones (1991) model.	*AbsDAC*
Control Variables	
Absolute value of total accruals for firm *i* divided by total assets for firm *i* for year *t-1*.	*ABSTAccurals*
Natural logarithm of the total assets of firm *i* for their fiscal year *t*.	*FSize*
Ratio of long-term debt of firm *i* for year *t* to total assets of firm *i* for year *t*.	*Leverage*
Ratio of earnings before extraordinary items of firm *i* for year *t* to total assets of firm *i* for year *t*.	*ROI*
Indicator variable with firm *i* scored one (1) if their incumbent auditor in fiscal year *t* is a Big-4 firm; otherwise scored zero (0).	*Big-4*
Indicator variable with firm *i* scored one (1) if it has occurred a financial loss at least once in the three prior fiscal years; otherwise scored zero (0).	*Losses*
Percentage of outstanding common shares owned by top 20 shareholders of firm *i* for year *t*.	*OwnCon%*
Ratio of market value for firm *i* at end year *t* to total assets (less intangible assets) for firm *i* at the end of year *t*.	*MV*
Cash flow from operations for firm *i* during the year *t* deflated by total assets as at end of year *t*-1.	*CashFlowOp*
Indicator variable with firm *i* scored one (1) if it is an Singaporean firm; otherwise scored zero (0)	*Country*
Independent Variables	
Ratio of non-audit fees paid by firm *i* to the external auditor to total audit fees paid by firm *i* to the external auditor in year *t*.	*NonAuditRatio*
Indicator variable if the auditor of firm *i* has 20% or more auditor industry market share in audit fees for an industry; otherwise scored zero (0).	*Specialist*

Table 3. Audit and non-audit fees breakdown by industry type and accounting firm

	N	Total Fee	Audit Fee						Non-Audit Fee				
		Mean (AUD$)	Mean (AUD$)	Median (AUD$)	SD (AUD$)	Min (AUD$)	Max (AUD$)	% Total Fee	Mean (AUD$)	Median (AUD$)	SD (AUD$)	Max® (AUD$)	% Total Fee
Panel A-Industry TypeΨ													
A Agriculture, Forestry & Fishing	10	153,730	118,082	88,224	124,008	20,000	441,166	76.81	35,648	22,864	34,901	111,397	23.19
B Mining	72	183,807	107,530	19,353	368,799	2,650	2,769,000	58.50	76,277	5,829	271,986	1,613,000	41.50
C Construction	24	281,794	185,892	106,438	361,740	38,016	1,851,000	65.97	95,901	25,792	312,135	1,554,000	34.03
D Manufacturing	211	186,350	125,389	64,155	252,878	2,630	2,951,800	67.29	60,961	15,089	181,114	1,905,200	32.71
E Transportation, Communication, Electric, Gas & Sanitary Services	67	345,945	208,383	88,241	403,376	13,000	2,785,895	60.24	137,561	27,200	296,818	1,456,000	39.76
F Whosale Trade	39	207,107	142,407	125,542	118,190	34,000	554,574	68.76	64,700	52,162	67,768	255,880	31.24
G Retail Trade	18	232,660	158,605	95,840	197,167	8,500	824,697	68.17	74,056	47,965	86,226	334,346	31.83
H Commercial	63	271,333	173,332	113,165	210,101	18,000	1,163,476	63.88	98,001	30,100	156,717	698,000	36.12
I Services	111	234,931	158,086	58,752	373,304	7,500	2,921,000	67.29	76,844	12,377	179,689	1,598,000	32.71
Total	***615***	**226,779**	**147,446**	**68,420**	**304,149**	**2,630**	**2,951,800**	***65.02***	**79,332**	**17,000**	**205,537**	**1,905,200**	***34.98***
Panel B-Accounting FirmΩ													
Big-4:													
PWC	105	364,346	249,100	126,478	434,831	2,650	2,785,895	68.37	115,246	41,500	224,796	1,568,000	31.63
KPMG	83	396,020	242,432	78,000	469,735	10,870	2,951,800	61.22	153,589	21,542	341,938	1,905,200	38.78
EY	204	238,260	144,623	76,298	260,933	7,000	2,921,000	60.70	93,637	28,294	211,439	1,613,000	39.30
DT	53	156,674	111,978	64,741	156,275	8,000	1,043,000	71.47	44,695	7,560	97,419	556,725	28.53
Total Big-4	*445*	*1155,3*	*748,133*	*345,517*	*1321,774*	*28,52*	*11,395*	*64.76*	*407,167*	*98,896*	*875,592*	*562,011*	*35.24*
Non Big-4	*170*	*67,327*	*52,765*	*37,703*	*55,787*	*2,630*	*441,166*	*78.37*	*14,562*	*5,000*	*26,110*	*191,000*	*21.63*
Total	**615**	**226,779**	**147,446**	**68,420**	**304,149**	**2,630**	**2,951,800**	**65.02**	**79,332**	**17,000**	**205,537**	**1,905,200**	**34.98**

Legend:

ΨIndustry type is defined in accordance with the USSIC schema.

Ω Big-4 audit firms abbreviations: PWC is PriceWaterhouse Coopers; KPMG is KPMG Peat Marwick; EY is Ernst & Young; and DT is Deloitte & Touche.

®The minimum amount of non-audit fees for each industry type and each accounting firm is zero.

Table 4. Audit firms' market share and audit specialisation

Industry[Ψ]	N	PWC[Ω]			KPMG[Ω]			EY[Ω]			DT[Ω]			Non-Big 4[√]			Specialist Auditor	
		N	AUD$	%	N	AUD$	%	N	AUD$	%	N	AUD$	%	N	AUD$	%	N	%
A	10	0	0	0.00	1	24,018	2.03	4	372,797	**31.57**	1	94,599	8.01	4	689,406	58.38	4	40.00
B	72	4	2,849,150	**36.80**	12	1,189,008	15.36	15	1,692,526	**21.86**	6	1,184,850	15.30	35	826,623	10.68	19	26.39
C	24	4	717,308	16.08	4	2,139,640	**47.96**	7	566,151	12.69	2	325,072	7.29	7	713,239	15.99	4	16.67
D	211	31	5,210,672	19.69	24	7,779,569	**29.40**	86	9,566,339	**36.16**	21	1,462,359	5.53	49	2,438,220	9.22	110	66.82
E	67	14	5,620,732	**40.26**	11	3,213,460	**23.02**	20	3,171,575	**22.72**	6	914,911	6.55	16	1,040,993	7.46	45	67.16
F	39	8	1,317,613	**23.72**	2	589,103	10.61	16	2,519,586	**45.37**	1	127,296	2.29	12	1,000,286	18.01	24	61.54
G	18	1	99,733	3.49	2	487,139	17.06	8	1,746,711	**61.18**	1	113,836	3.99	6	407,465	14.27	8	44.44
H	63	21	4,312,983	**39.50**	14	3,049,200	**27.92**	19	2,777,699	**25.44**	2	354,781	3.25	7	425,256	3.89	54	85.71
I	111	22	6,027,317	**34.35**	13	1,650,684	9.41	29	7,089,734	**40.40**	13	1,357,144	7.73	34	1,422,720	8.11	51	45.95
Total	**615**	***105***	***845,843***	***28.84***	***83***	***1121,84***	***22.19***	***204***	***971,678***	***32.54***	***53***	***1935,851***	***6.54***	***170***	***3070,108***	***9.89***	**319**	**51.87 918.00%**

Legend:

[Ψ]See Table 3 for the full descriptions for industry type. Industry sectors are defined in accordance with the USSIC schema.

[Ω]Big-4 audit firms abbreviations: PWC is PriceWaterhouse Coopers; KPMG is KPMG Peat Marwick; EY is Ernst & Young; and DT is Deloitte & Touche. Audit firms with an audit fee market share in a given industry sector in excess of 20% are identified as industry specialists. Where identified as industry specialist the *Big-4* audit firm is highlighted in bold.

[√]None of a Non Big-4 audit firm in a certain industry earned 20% or more audit fee market share.

Table 5. Descriptive statistics of dependent and control variables

Variable Description	Mean	Std Dev	Median	25 Percentile	75 Percentile
Dependent Variable:					
Total Accruals (AUD$,000)	-18,914	136,620	-1,485	-8,406	384
Deflated Total Accruals	-0.03346	0.8767	-0.0381	-0.1051	0.0139
DACs	-0.0027	0.1612	-0.0046	-0.0825	0.0872
AbsDAC	0.1159	0.1120	0.0843	0.0395	0.1573
Control Variables:					
FSize (Total Assets, AUD$,000)	427,897	1,598,414	52,381	15,903	215,778
ABSTAccruals	0.1546	0.8636	0.0670	0.0299	0.1337
Leverage	0.1236	0.1864	0.0504	0.0015	0.1929
ROI	-0.0402	1.8809	0.0300	-0.1066	0,0736
Big-4 (% of Sample)	72.3577				
Losses (% of Sample)	59.1870				
CashFlowOp	-0.0208	0.4297	0.0363	-0.0664	0.1010
OwnCon%	69.7251	17.9968	74.2900	57.3600	84.0500
MV	1.7348	3.6833	0.8323	0.4447	1.7865
Country (% of Sample)	49.2683				

Legend: See Table 2 for full definitions and descriptions for the study's dependent, independent and control variables.

Table 6. Multiple regression results for the pooled sample

	Prediction	Panel A–*Equation 1*		Panel B–*Equation 2*		Panel C–*Equation 3*	
		Beta	*t*-statistic	Beta	*t*-statistic	Beta	*t*-statistic
(Constant)			7.736*		7.523*		7.469*
ABSTAccruals	+	0.402	11.401*	0.401	11.418*	0.401	11.398*
FSize	-	-0.030	-0.612	-0.025	-0.527	-0.018	-0.366
Leverage	+	-0.003	-0.072	-0.008	-0.205	-0.008	-0.194
ROI	-	-0.201	-5.128*	-0.204	-5.238*	-0.207	-5.285*
Big-4	-	-0.009	-0.236	0.053	1.136	0.055	1.182
Losses	+	0.121	3.080*	0.112	2.865*	0.114	2.891*
OwnCon%	-	0.000	-0.001	0.002	0.051	0.003	0.083
MV	+	-0.001	-0.018	0.005	0.117	0.006	0.147
CashFlowOp	-	-0.232	-6.243*	-0.226	-6.103*	-0.227	-6.128*
Country		-0.148	-3.312*	-0.143	-3.235*	-0.147	-3.306*
NonAuditRatio	-	-0.036	-0.994			-0.028	-0.771
Specialist	-			-0.112	-2.501**	-0.109	-2.419**
Model Summary							
R-Squared		0.307		0.313		0.314	
Adj. R-Squared		0.295		0.301		0.300	
F-Statistic		24.306*		24.997*		22.948*	
Sample Size		615		615		615	

Legend:
*, **, and *** indicate significance at p<0.01, p<0.05 and p<0.10, respectively (based on two-tailed tests). See Table 2 for full definitions and descriptions for the dependent, independent and control variables.

Table 7. Multiple Regression results for partitioned pooled sample by audit firm size

	Prediction	Audit firm size			
		Panel A-Non Big 4		Panel B-Big 4	
		Beta	***t*-statistic**	**Beta**	***t*-statistic**
(Constant)			1.693***		8.028*
ABSTAccruals	+	0.521	7.620*	0.360	8.624*
FSize	-	0.117	1.226	-0.071	-1.348
Leverage	+	-0.054	-0.700	-0.027	-0.573
ROI	-	-0.301	-3.228*	-0.160	-3.702*
Losses	+	0.208	2.865*	0.087	1.880***
OwnCon%	-	-0.01	-0.013	0.030	0.635
MV	+	0.018	0.229	-0.031	-0.612
CashFlowOp	-	-0.151	-1.823***	-0.265	-6.279*
Country		-0.030	-0.402	-0.215	-4.036*
NonAuditRatio	-	-0.036	-0.554	-0.012	-0.284
Specialist	-	N/A	N/A	-0.107	-2.570*
Model Summary					
R-Squared		0.376		0.303	
Adj. R-Squared		0.337		0.286	
F-Statistic		9.586*		17.151*	
Sample Size		170		445	

Legend: *, **, and *** indicate significance at p<0.01, p<0.05 and p<0.10, respectively (based on two-tailed tests). See Table 2 for full definitions and descriptions for the dependent, independent and control variables.

Table 8. Multiple regression results for partitioned pooled sample by client firm performance

	Prediction	Client Firm Performance			
		Panel A-Poor Performing		Panel B-Good Performing	
		Beta	***t*-statistic**	**Beta**	***t*-statistic**
(Constant)			7.549*		-0.516
ABSTAccruals	+	0.476	10.980*	0.291	4.743*
FSize	-	0.021	0.338	-0.042	-0.577
Leverage	+	-0.075	-1.532	0.133	1.776***
ROI	-	-0.272	-5.142*	-0.084	-1.352
Big-4	-	0.019	0.325	0.131	1.611
OwnCon%	-	-0.006	-0.124	0.037	0.518
MV	+	-0.014	-0.242	0.023	0.315
CashFlowOp	-	-0.324	-7.028*	0.093	1.296
Country		-0.161	-2.848*	-0.114	-1.328
NonAuditRatio	-	-0.056	-1.268	0.028	0.434
Specialist	-	-0.092	-1.656***	-0.128	-1.621
Model Summary					
R-Squared		0.378		0.129	
Adj. R-Squared		0.359		0.089	
F-Statistic		19.460*		3.231*	
Sample Size		364		251	

Legend: *, **, and *** indicate significance at p<0.01, p<0.05 and p<0.10, respectively (based on two-tailed tests). See Table 2 for full definitions and descriptions for the dependent, independent and control variables.

Table 9. Multiple regression results for partitioned pooled sample by country

	Prediction	Country			
		Panel A-Australia		Panel B-Singapore	
		Beta	***t*-statistic**	**Beta**	***t*-statistic**
(Constant)			6.660*		-1.069
ABSTAccruals	+	0.488	10.068*	0.299	5.597*
FSize	-	-0.053	-0.752	0.011	0.179
Leverage	+	-0.004	-0.078	-0.018	-0.317
ROI	-	-0.183	-3.347*	-0.330	-5.664*
Big-4	-	0.091	1.342	0.005	0.081
Losses	+	0.125	2.149**	0.016	0.277
OwnCon%	-	0.005	0.095	0.033	0.593
MV	+	0.012	0.221	-0.031	-0.513
CashFlowOp	-	-0.326	-6.352*	0.099	1.792***
NonAuditRatio	-	-0.023	-0.460	-0.034	-0.655
Specialist	-	-0.082	-1.207	-0.119	-1.985**
Model Summary					
R-Squared		0.358		0.282	
Adj. R-Squared		0.335		0.255	
F-Statistic		15.221*		10.415*	
Sample Size		312		303	

Legend:
*, **, and *** indicate significance at p<0.01, p<0.05 and p<0.10, respectively (based on two-tailed tests). See Table 2 for full definitions and descriptions for the dependent, independent and control variables.